Draft Environmental Impact Report

SCH# 2023060293

Volume 1

Chapters 1 – 12

CarbonFrontier CCS Project
by Aera Energy, LLC *(PP23402)*

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Conditional Use Permit No. 9, Map 51
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Kern County
Planning and Natural Resources Department
Bakersfield, California

June 2024

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PLANNING AND NATURAL RESOURCES DEPARTMENT

Planning
Community Development
Administrative Operations

NOTICE OF AVAILABILITY FOR PUBLIC REVIEW AND HEARING ON THE DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE CARBONFRONTIER CARBON CAPTURE AND STORAGE (CCS) PROJECT

This is to advise that the Kern County Planning and Natural Resources Department has prepared a Draft Environmental Impact Report (EIR) for the project identified below.

As mandated by State law, the minimum public review period for this document is 45 days.

PROJECT TITLE: Draft EIR CarbonFrontier CCS Project by Aera Energy, LLC (PP23402); ZCC No. 4, Map 51; ZCC No. 3, Map 74; ZCC No. 4, Map 75; CUP No. 9, Map 51; CUP No. 10, Map 51; CUP No. 7, Map 74; CUP No. 9, Map 74; CUP No. 7, Map 75; CUP No. 11, Map 75; CUP No. 9, Map.

PROJECT LOCATION: The proposed project site is located within the Central Valley portion of unincorporated Kern County and within the administrative boundaries of the North and South Belridge oilfields, which is currently owned and operated by Aera Energy, LLC. The proposed project is approximately 12,362 surface acres located on Sections 21, 22, 26, 27, 28, 34, 35, and 36 of Township 27 South, Range 20 East; Sections 1, 2, and 12 of Township 28 South, Range 20 East; Sections 6, 7, 17, 18, 20, 27, 28, 29, 32, 33, and 34 of Township 28 South Range 21 East; and Sections 2, 3, and 4 of Township 29 South, Range 21 East of the Mount Diablo Base and Meridian (MDBM). The North and South Belridge oilfields are contiguous and located west of Highway 33. The Conditional Use Permit boundary, which includes the CCS Surface Land Area and Underground Storage Area (pore space) for the proposed project are approximately seven (7) miles southwest of the community of Lost Hills. Aera Energy, LLC. owns or controls the surface and pore space for approximately 12,268.57 acres with approximately 93.01 acres being provisionally included as owned by others.

DOCUMENT AVAILABILITY: The Draft EIR and the documents referenced in it are available for public review at the Planning and Natural Resources Department, which is located at 2700 "M" Street, Suite 100, in Bakersfield, CA 93301 or on the Department website at: **https://kernplanning.com/environmental-doc/carbonfrontier-ccs-project**

PUBLIC COMMENT: The required Draft EIR public review period is 45 days.

June 28th, 2024 – August 12th, 2024

Written comments may be submitted to the project planner identified below prior to the close of the Draft EIR public review period on **August 12th, 2024, at 5:00 p.m.** to:

Kern County Planning and Natural Resources Department
ATTN: Keith Alvidrez, Planner II
2700 "M" Street, Suite 100, Bakersfield, CA 93301
Phone: (661) 862-5015
E-mail: CF-EIRComments@kerncounty.com

PUBLIC HEARING: A public hearing has been scheduled with the Kern County Planning Commission to consider a recommendation on the project and solicit comments on the adequacy and completeness of the analysis and proposed mitigation measures described in the Draft EIR. You may comment by providing testimony at the public hearing or additional written comments on:

DATE: **September 12th, 2024**
TIME: **7:00 P.M. or soon thereafter**
LOCATION: **Chambers of the Board of Supervisors**
Kern County Administrative Center, First Floor
1115 Truxtun Avenue, Bakersfield, CA 93301

After consideration by the Planning Commission, a public hearing will be scheduled for the Kern County Board of Supervisors for final consideration and action. Comments may be provided at that hearing or prior to any action by the Board of Supervisors on any matter. The Board of Supervisors decision is final.

If you challenge the action taken on this request in court, you may be limited to raising only those issues you or someone else raised at this public hearing, or in written correspondence delivered to the Planning and Natural Resources Department at, or prior to, the public hearing.

ASSISTANCE: If you have any **questions** about the proposed project or issues accessing the document, please contact the project planner directly :

Kern County Planning and Natural Resources Department
ATTN: Keith Alvidrez, Planner II
2700 "M" Street, Suite 100, Bakersfield, CA 93301
Phone: (661) 862-5015
E-mail: AlvidrezK@kerncounty.com

PROJECT DESCRIPTION: The proposed project would construct and operate a CCS facility for permanent underground storage of up to 40 million metric tons of carbon dioxide (CO_2) in the storage space (referred to as the 64 Zone reservoir) on approximately 12,362 surface acres in the North and South Belridge oilfield in unincorporated Kern County. The CCS facility would be comprised of four (4) CO_2 capture sites which consist of one (1) pre-combustion and three (3) post-combustion sources, up to nine (9) Class VI underground injection control (UIC) wells, up to eight (8) monitoring wells, and approximately 14.5 miles of CO_2 facility pipelines.

The proposed CCS project would capture CO_2 from an initial source of existing produced gas streams (pre-combustion) and emissions from existing stationary sources (post-combustion) within the South Belridge Oil Field and transport the CO_2 through a facility pipeline to the North Belridge oilfield for injection at up to the nine (9) dedicated Class VI UIC wells. The proposed CO_2 underground storage pace, which is approximately 2,290 acres in size (maximum modeled CO_2 plume area), would be located within the North Belridge oilfield within the CCS Surface Land Area rights held by Aera Energy and other private owners. Oil and gas production activities would cease within the established CCS underground geologic formation where CO_2 would be stored, prior to commencement of the proposed project.

Implementation of the proposed project includes the following requests :

- Zone Change Cases (ZCC No. 4, Map No 51, ZCC No. 3, Map No. 74, and ZCC No. 4, Map No. 75) from A-1 (limited Agriculture) to A (Exclusive Agriculture) on

approximately 1,737 acres and from A/NR (Natural Resources – 20-acre minimum) to A (Exclusive Agriculture) on approximately 47 acres.

- Conditional Use Permits (CUP No. 9, Map 51, CUP No. 10, Map 51; CUP No. 7, Map 74; CUP No. 9, Map 74; CUP No. 7, Map 75; CUP No. 11, Map 75; CUP No. 9, Map 96) to permit the construction and operation of the CCS facility on approximately 12,362 acres with site installation of nine (9) Class VI UIC injection wells, up to eight (8) CO_2 monitoring wells, one (1) downhole seismic monitoring station, transport of CO_2 by facility pipeline, and the construction and operation of accessory infrastructure for CO_2 storage capacity of up to 40 million metric tons of CO_2 within the A (Exclusive Agriculture) Zone District.

ENVIRONMENTAL REVIEW FINDINGS: Anticipated significant and unavoidable impacts on Aesthetics, Agricultural Resources, Air Quality, Biological Resources, Cultural Resources, Energy, Geology and Soils, Greenhouse Gases, Hydrology and Water Quality (Water Supply), Mineral Resources, Noise, and Utilities and Service Systems (Water Supply).

LORELEI H. OVIATT, AICP, Director
Planning and Natural Resources Department

To be published once only on next available date and as soon as possible

THE BAKERSFIELD CALIFORNIAN
TAFT MIDWAY DRILLER

KTA (06/28/24)

cc: County Clerk (2) (with fee)
Environmental Status Board
Supervisorial District No. 4

Carbon Frontier CCS Project
Interested Parties & Agencies

City of Arvin
P.O. Box 548
Arvin, CA 93203

Bakersfield City Planning Dept
1715 Chester Avenue
Bakersfield, CA 93301

Bakersfield City Public Works Dept
1501 Truxtun Avenue
Bakersfield, CA 93301

California City Planning Dept
21000 Hacienda Blvd.
California City, CA 93515

Delano City Planning Dept
P.O. Box 3010
Delano, CA 93216

City of Maricopa
P.O. Box 548
Maricopa, CA 93252

City of McFarland
401 West Kern Avenue
McFarland, CA 93250

City of Ridgecrest
100 West California Avenue
Ridgecrest, CA 93555

City of Shafter
336 Pacific Avenue
Shafter, CA 93263

City of Taft
Planning & Building
209 East Kern Street
Taft, CA 93268

City of Tehachapi
Attn: John Schlosser
115 South Robinson Street
Tehachapi, CA 93561-1722

City of Wasco
764 E Street
Wasco, CA 93280

Inyo County Planning Dept
P.O. Drawer "L"
Independence, CA 93526

Kings County Planning Agency
1400 West Lacey Blvd, Bldg 6
Hanford, CA 93230

San Joaquin County Community
Development Department
1810 E Hazelton Ave
Stockton, CA 95205

Solano County Department of Resource
Management – Planning Services Division
675 Texas Street, Suite 5500
Fairfield, CA 94533

Sacramento County Planning and
Environmental Review
827 7th Street
Sacramento, CA 95814

Fresno County Public Works & Planning
2220 Tulare Street, 6TH Floor
Fresno, CA 93721

Los Angeles Co Reg Planning Dept
320 West Temple Street
Los Angeles, CA 90012

San Bernardino Co Planning Dept
385 North Arrowhead Avenue, 1st Floor
San Bernardino, CA 92415-0182

Santa Barbara Co Resource Mgt Dept
123 East Anapamu Street
Santa Barbara, CA 93101

Tulare County Planning & Dev Dept
5961 South Mooney Boulevard
Visalia, CA 93291

San Luis Obispo Co Planning Dept
Planning and Building
976 Osos Street
San Luis Obispo, CA 93408

Ventura County RMA Planning Div
800 South Victoria Avenue, L1740
Ventura, CA 93009-1740

U.S. Bureau of Land Management
Caliente/Bakersfield
35126 McMurtrey Avenue
Bakersfield, CA 93308

Federal Communications Comm
18000 Studebaker Road, #660
Cerritos, CA 90701

California Dept of Conservation
Geologic Energy Management Division
801 K Street, MS 20-20
Sacramento, CA 95814

U. S. Fish & Wildlife Service
Division of Ecological Services
2800 Cottage Way #W-2605
Sacramento, CA 95825-1846

Environmental Protection Agency
Region IX Office
75 Hawthorn Street
San Francisco, CA 94105

U.S. Dept of Agriculture/NRCS
5080 California Avenue, Ste 150
Bakersfield, CA 93309-0711

California Air Resources Board
Stationary Resource Division
P.O. Box 2815
Sacramento, CA 95812

So. San Joaquin Valley Arch Info Ctr
California State University of Bkfd
9001 Stockdale Highway
Bakersfield, CA 93311

Caltrans/Dist 6
Planning/Land Bank Bldg.
P.O. Box 12616
Fresno, CA 93778

State Dept of Conservation
Director's Office
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Sacramento, CA 95814

State Dept of Conservation
Geologic Energy Management Division
11000 River Run Boulevard
Bakersfield, CA 93311

Office of the State Geologist
Headquarters
715 "P" Street, MS 1901
Sacramento, CA 95814

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Bakersfield - Library
9001 Stockdale Highway
Bakersfield, CA 93309

California Energy Commission
James W. Reed, Jr.
1516 Ninth Street, Mail Stop 17
Sacramento, CA 95814

California Fish & Wildlife
1234 East Shaw Avenue
Fresno, CA 93710

California Dept of Food & Agriculture
1220 "N" Street
Sacramento, CA 95814

California Highway Patrol
Planning & Analysis Division
P.O. Box 942898
Sacramento, CA 94298-0001

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Nataly Santamaria
1000 Alameda Street
Los Angeles, CA 90012

California Regional Water Quality
Control Board/Central Valley Region
1685 E Street
Fresno, CA 93706-2020

State Dept of Toxic Substance Control
Environmental Protection Agency
1515 Tollhouse Road
Clovis, CA 93612

Cal Environmental Protection Agency
Dept of Toxic Substances Control
Attn: Dave Kereazis
8800 Cal Center Drive, 2nd Floor
Sacramento, CA 95826

State Dept of Water Resources
San Joaquin Dist.
3374 East Shields Avenue, Room A-7
Fresno, CA 93726

State Dept of Water Resources
Div. Land & Right-of-Way
P.O. Box 942836
Sacramento, CA 94236

Kern County
Agriculture Department

Kern County Administrative Officer

Kern County Public Works Department
Building & Development/Floodplain

Kern County Public Works Department
Building & Development/Survey

Kern County
Env Health Services Department

Kern County Fire Dept
Aaron Duncan, Fire Chief

Kern County Library/Beale
Local History Room

Kern County Library/Beale
Andie Sullivan

Kern County Library
Buttonwillow Branch
116 Buttonwillow Avenue
Buttonwillow, CA 93206

Kern County Parks & Recreation

Kern County Sheriff's Dept
Administration

Kern County Public Works Department
Building & Development
Development Review

Kern County Public Works Department
Operations & Maintenance
Regulatory Monitoring & Reporting

Central California Asthma Collaborative
Gustavo Aguirre, Associate Director
1939 N Gateway Blvd, Suite 103
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Taft, CA 93268

Taft Union High School District
701 - 7th Street
Taft, CA 93268

Wasco Union High School District
P.O. Box 250
Wasco, CA 93280

Wasco Union Elementary School District
639 Broadway
Wasco, CA 93280

Lost Hills Union School District
P.O. Box 158
Lost Hills, CA 93249

Kern County Superintendent of Schools
Attention School District Facility Services
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Bakersfield, CA 93301

California State Fire Marshall
P.O. Box 944246
Sacramento, CA 94244

Central Valley Air Quality Coalition
Jasmin Martinez, Coalition Coordinator
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Kern County Water Agency
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P.O. Box 205
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601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080

Kern Audubon Society
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4124 Chardonnay Drive
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Ileana Navarro, Community Organizer
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Sacramento, CA 95814

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2300 River Plaza Drive, NRED
Sacramento, CA 95833

Native American Heritage Council
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650 "O" Street, First Floor
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Bakersfield, CA 93308-9477

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Transportation Dept
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Attention Engineering Department
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Fresno, CA 93704-1755

Torres Martinez Desert Cahuilla Indians
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PO Box 1160
Thermal, CA 92274

Twenty-Nine Palms Band of Mission Indians
Attn: Anthony Madrigal Jr.
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P.O. Box 277
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California Public Utilities Commission
Attn: President Alice Reynolds
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California State Geological Survey
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Bakersfield, CA 93308

Kern Citizens for Energy
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Hess Corporation
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Bakersfield, CA 93301

PCL Industrial Services
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Bakersfield, CA 93307

Vintage Production California
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Bakersfield, CA 93311

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Bakersfield, CA 93309

Total Western
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Bakersfield, CA 93308

Baker Hughes
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Shafter, CA 93263

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Bakersfield, CA 93308

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Bakersfield, CA 93308

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Center for Biological Diversity
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Kern Community College District
Chancellor's Office
2100 Chester Avenue
Bakersfield, CA 93301

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Bonita Steele, Ed. D
2100 Chester Avenue
Bakersfield, CA 93301

City of Bakersfield, Office of the Mayor
Attn: Karen Goh, Mayor
1501 Truxtun Avenue
Bakersfield, CA 93301

Governor's Office of Business and
Economic Development
Dee Dee Myers, Advisor & Director
1325 J Street, 18th Floor
Sacramento, CA 95814

California Workforce Development Board
Tim Rainey, Executive Director
800 Capitol Mall, Suite 1022
Sacramento, CA 95814

Chevron New Energies
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9525 Camino Media
Bakersfield, CA 93311

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2501 Portola Way
Sacramento, CA 95818

Kern County Farm Bureau
Rachel Nettleton, Executive Director
1800 30th Street, Suite 390
Bakersfield, CA 93301

Climate Now
Attn: James Lawler
P.O. Box 133
East Chatham, NY 12060

Employers' Training Resource
1600 East Belle Terrace
Bakersfield, CA 93307

Greater Bakersfield Chamber Commerce
Janelle Capra, President & CEO
1725 Eye Street
Bakersfield, CA 93301

International Brotherhood Electrical Workers
Brian Holt, Business Manager
3921 Sillect Avenue
Bakersfield, CA 93308

Tejon Indian Tribe
Octavio Escobedo, Tribal Chair
P.O. Box 640
Arvin, CA 93203

Building Trades Council
Kern, Inyo, & Mono Counties, AFL-CIO
John Spaulding, Executive Secretary
200 West Jeffrey Street
Bakersfield, CA 93305-2434

California Independent Systems Operators
250 Outcropping Way
Folsom, CA 95630

Center for Biological Diversity
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Stephen Reid
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Gabe Pattee
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Geyserville, Ca 95441

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Bakersfield, CA 93311

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Environmental Law & Justice Clinic
Attn: Lucas Williams
536 Mission Street
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Golden Gate University School of Law
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TC Energy
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Reno, NV 89502

State Dept of Conservation
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Sacramento, CA 95814

US EPA Region IX
Attn: David Albright
Manager Groundwater Protection Section
75 Hawthorne Street
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Twenty-Nine Palms Band of Mission Indians
Attn: Darrell Mike, Tribal Chairman
46-200 Harrison Place
Coachella, CA 92236

California Division of State Architect
1102 Q Street, Suite 5100
Sacramento, CA 95811

California Department of Education
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Sacramento, CA 95814

Center for Biological Diversity
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Oakland, CA 94612

Buena Vista Museum of Natural
History & Science
2018 Chester Ave
Bakersfield, CA 93301

California Air Pollution Control
Officers Association
1107 9th Street, Unit 801
Sacramento, CA 95814

Federal Motor Carrier Safety Administration
United States Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

U.S. Department of Labor Occupational
Safety and Health Administration
200 Constitution Ave NW
Washington, DC 20210

California Department of Industrial
Relations, Division of OSHA
2550 Mariposa Mall, Room 2005
Fresno, CA 93721

CarbonFrontier CCS Project
Surrounding Property Owners

068 200 43 00 7 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 200 61 00 9 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 200 62 00 2 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 200 63 00 5 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 200 64 00 8 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 200 65 00 1 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 210 18 00 8 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 210 62 00 5 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 210 66 00 7 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 210 68 00 3 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 01 00 1 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 08 00 2 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 13 00 6 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 25 00 1 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 26 01 3 **(PROJECT)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1164

068 220 36 00 3 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 43 00 3 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 44 00 6 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 45 00 9 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 46 00 2 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 47 00 5 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 57 01 3 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 57 02 2 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 59 00 0 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 60 00 2 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 61 00 5 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 62 00 8 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 64 00 4 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 66 00 0 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 71 00 4
AERA ENERGY LLC
10000 MING AV
BAKERSFIELD CA 93311-1301

068 220 72 00 7 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 220 74 00 3 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 230 03 00 0 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 230 04 00 3 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 230 05 06 0 **(DUP)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1164

068 230 06 06 3 **(DUP)**
AERA ENERGY LLC
10000 MING AV
BAKERSFIELD CA 93311-1301

068 230 09 00 8 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 230 14 00 2
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93891-1647

068 260 02 00 6 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 260 03 00 9 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 270 02 00 9 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

068 270 03 00 2 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 110 02 00 7 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389

085 110 07 00 2 **(DUP)**
AERA ENERGY LLC
10000 MING AV
BAKERSFIELD CA 93311-1301

085 110 10 01 9 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389

085 110 11 00 3 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389

085 110 13 00 9 **(DUP) (PROJECT)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1164

085 110 14 00 2 **(DUP) (PROJECT)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1164

085 110 16 00 8 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389

085 110 19 00 7 **(DUP)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1164

085 110 20 00 9 **(DUP)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1164

085 110 21 00 2 **(DUP)**
AERA ENERGY LLC
10000 MING AV
BAKERSFIELD CA 93311-1301

085 110 24 01 0 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389

085 110 24 02 9 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389

085 110 24 03 8 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389

085 110 24 05 6 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389

085 110 32 00 4 **(DUP) (PROJECT)**
AERA ENERGY LLC
10000 MING AV
BAKERSFIELD CA 93311-1313

085 110 37 00 9 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 110 38 00 2 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 110 39 00 5 **(DUP)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1164

085 110 42 00 3 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 110 43 00 6 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 110 46 00 5 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 110 47 00 8 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 110 50 00 6 **(DUP) (PROJECT)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1116

085 110 51 00 9 **(DUP)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1164

085 110 52 00 2 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 110 54 00 8 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 130 08 00 1 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389

085 130 09 03 1 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389

085 130 42 00 9 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389

085 130 46 00 1 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 190 15 00 9 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 190 21 00 6 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 190 22 00 9 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 190 27 00 4 **(DUP) (PROJECT)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1116

085 190 28 00 7 **(DUP) (PROJECT)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1116

085 190 34 00 4 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 200 24 00 7 **(DUP)**
AERA ENERGY LLC
10000 MING AV
BAKERSFIELD CA 93311-1301

085 210 02 00 6 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 210 15 00 4 **(DUP)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1116

085 210 17 00 0 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 210 18 00 3 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 210 20 00 8 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 210 26 00 6 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 210 40 00 6 **(DUP) (PROJECT)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1116

085 210 43 00 5 **(DUP) (PROJECT)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1116

085 210 45 00 1 **(DUP)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1116

085 220 19 00 9 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 220 21 00 4 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 220 22 00 7 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 220 23 00 0 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 220 24 00 3 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 220 25 00 6 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 220 26 00 9 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 220 29 00 8 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 220 31 00 3 **(DUP)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1116

085 220 36 00 8 **(DUP) (PROJECT)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1116

085 220 37 00 1 **(DUP)**
AERA ENERGY LLC
PO BOX 11164
BAKERSFIELD CA 93389-1164

085 230 05 00 1 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 230 07 00 7 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 230 09 00 3 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 230 25 00 9 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 230 26 00 2 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 230 28 00 8 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 230 33 00 2 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 230 34 00 5 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 230 37 00 4 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 230 38 00 7 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 230 42 00 8 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 270 04 00 0 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 270 05 00 3 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 111 01 00 5 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 111 02 00 8 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 111 03 00 1 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 111 04 00 4 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 111 08 00 6 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 111 09 00 9 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 111 10 00 1 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 111 11 00 4 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 111 12 00 7 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 111 13 00 0 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 112 01 00 2 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 112 02 00 5 **(DUP) (PROJECT)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 112 03 00 8 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 112 04 00 1 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 112 06 00 7 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 112 07 00 0 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 112 08 00 3 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 112 09 00 6 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 112 10 00 8 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 112 11 00 1 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 112 12 00 4 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 112 13 00 7 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 112 14 00 0 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 112 15 00 3 **(DUP)**
AERA ENERGY LLC
10000 MING AV
BAKERSFIELD CA 93311-1313

098 113 07 00 7 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 113 08 00 0 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 113 09 00 3 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 113 10 00 5 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 113 13 00 4 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 113 14 00 7 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 120 10 00 7 **(DUP) (PROJECT)**
AERA ENERGY LLC
10000 MING AV
BAKERSFIELD CA 93311

098 120 49 00 1 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

098 200 01 00 4 **(DUP)**
AERA ENERGY LLC
P O BOX 11164
BAKERSFIELD CA 93389-1164

085 230 48 00 6
BELRIDGE ENERGY RESOURCES INC
P O BOX 5566
BAKERSFIELD CA 93380-5566

068 220 35 00 0
BELRIDGE FARMS & PACKING LLC
PO BOX 11164
BAKERSFIELD CA 93389-1164

068 220 69 00 9 **(DUP)**
BELRIDGE FARMS & PACKING LLC
PO BOX 11164
BAKERSFIELD CA 93389-1164

085 200 23 00 4 **(DUP)**
BELRIDGE FARMS & PACKING LLC
PO BOX 11164
BAKERSFIELD CA 93389-1164

085 210 46 00 4 **(DUP)**
BELRIDGE FARMS & PACKING LLC
PO BOX 11164
BAKERSFIELD CA 93389-1164

085 220 32 00 6 **(DUP)**
BELRIDGE FARMS & PACKING LLC
PO BOX 11164
BAKERSFIELD CA 93389-1164

085 220 38 00 4 **(DUP)**
BELRIDGE FARMS & PACKING LLC
PO BOX 11164
BAKERSFIELD CA 93389-1164

085 220 39 00 7 **(DUP)**
BELRIDGE FARMS & PACKING LLC
PO BOX 11164
BAKERSFIELD CA 93389-1164

098 113 02 00 2
BELRIDGE WATER STORAGE DIST
P O BOX 1087
BAKERSFIELD CA 93302

085 130 40 00 3
BERRY PETROLEUM COMPANY LLC
11117 RIVER RUN BL
BAKERSFIELD CA 93311-8957

085 210 10 00 9 **(DUP)**
BERRY PETROLEUM COMPANY LLC
11117 RIVER RUN BL
BAKERSFIELD CA 93311-8957

085 210 24 00 0 **(DUP)**
BERRY PETROLEUM COMPANY LLC
11117 RIVER RUN BL
BAKERSFIELD CA 93311-8957

068 220 37 00 6 **(PROJECT)**
BLOEMER ESTATE LP
4948 ENGLE RD
BAKERSFIELD CA 93313-9707

068 220 38 00 9 **(DUP)**
BLOEMER ESTATE LP
4948 ENGLE RD
BAKERSFIELD CA 93313-9707

068 220 73 00 0
CALIFORNIA RESOURCES
PETROLEUM CORPORATION
27200 TOURNEY RD STE 200
SANTA CLARITA CA 91355-4910

068 210 34 00 4
CATHER-HERLEY OIL CO
800 E WARDLOW RD
LONG BEACH CA 90807

068 210 35 00 7 **(DUP)**
CATHER-HERLEY OIL CO
800 E WARDLOW RD
LONG BEACH CA 90807

068 210 63 00 8
CATHER-HERLEY OIL CO
P O BOX 7397
LONG BEACH CA 90807-7397

068 220 14 00 9
CHEVRON USA INC
P O BOX 1392
BAKERSFIELD CA 93302-1392

068 220 55 00 8 **(DUP) (PROJECT)**
CHEVRON USA INC
P O BOX 1392
BAKERSFIELD CA 93302-1392

068 220 56 00 1 **(DUP)**
CHEVRON USA INC
P O BOX 1392
BAKERSFIELD CA 93302-1392

085 110 04 00 3 **(DUP)**
CHEVRON USA INC
P O BOX 1392
BAKERSFIELD CA 93302-1392

068 220 39 00 2 **(PROJECT)**
DIVERSIFIED ROYALTIES LTD
P O BOX 870849
MESQUITE TX 75187-0849

068 220 40 00 4
DIVERSIFIED ROYALTIES LTD
P O BOX 489
SEAGOVILLE TX 75159

085 230 36 00 1
E & B NATURAL RES MGMT CORP
1608 NORRIS RD
BAKERSFIELD CA 93308-2238

085 230 39 00 0 **(DUP)**
E & B NATURAL RES MGMT CORP
1608 NORRIS RD
BAKERSFIELD CA 93308-2238

085 230 46 00 0 **(DUP)**
E & B NATURAL RES MGMT CORP
1608 NORRIS RD
BAKERSFIELD CA 93308-2238

085 230 49 00 9 **(DUP)**
E & B NATURAL RES MGMT CORP
1608 NORRIS RD
BAKERSFIELD CA 93308-2238

068 230 05 05 1
E & B NATURAL RES MGMT CORP
1608 NORRIS RD
BAKERSFIELD CA 93308

068 230 06 05 4 **(DUP)**
E & B NATURAL RES MGMT CORP
1608 NORRIS RD
BAKERSFIELD CA 93308

068 230 05 04 2
EPSTEIN SUSAN LEVINSON LIV TR
12014 SW 60TH AV
PORTLAND OR 97219-7008

068 230 06 04 5 **(DUP)**
EPSTEIN SUSAN LEVINSON LIV TR
12014 SW 60TH AV
PORTLAND OR 97219-7008

068 220 41 00 7
ESCOBAR MARIA
195 W ELM AV
COALINGA CA 93210

068 220 09 00 5
GAIA RESOURCES LLC
P O BOX 11164
BAKERSFIELD CA 93387-1164

085 110 24 04 7
JENKINS RICHARD & KATHLEEN
P O BOX 3001
ALPINE WY 83128-3001

068 200 30 00 9 **(PROJECT)**
KERN ENTERPRISES LLC
11108 TORBAY DR
BAKERSFIELD CA 93311-2924

068 200 36 00 7 **(DUP)**
KERN ENTERPRISES LLC
11108 TORBAY DR
BAKERSFIELD CA 93311-2924

068 200 37 00 0 **(DUP) (PROJECT)**
KERN ENTERPRISES LLC
11108 TORBAY DR
BAKERSFIELD CA 93311-2924

068 210 14 00 6 **(DUP)**
KERN ENTERPRISES LLC
11108 TORBAY DR
BAKERSFIELD CA 93311-2924

068 210 19 00 1
LALEZARI EHSANALLAH & MAHNAZ
7606 BRAE ACRES CT
HOUSTON TX 77074-4123

085 230 03 00 5
LUNDIN WEBER CO LLC
1900 WASACH DR
LONGMONT CO 80504-3775

085 230 10 00 5 **(DUP)**
LUNDIN WEBER CO LLC
1900 WASACH DR
LONGMONT CO 80504-3775

085 230 20 00 4 **(DUP)**
LUNDIN WEBER CO LLC
1900 WASACH DR
LONGMONT CO 80504-3775

085 230 50 00 1 **(DUP)**
LUNDIN WEBER CO LLC
1900 WASACH DR
LONGMONT CO 80504-3775

085 230 51 00 4 **(DUP)**
LUNDIN WEBER CO LLC
1900 WASACH DR
LONGMONT CO 80504-3775

068 210 50 00 0
MARAHD PROP LLC
7404 CALLE SAGRADA
BAKERSFIELD CA 93309

068 230 05 07 9
MITCHEL CARYL C CHARITABLE
1600 HUNTINGTON DR
SOUTH PASADENA CA 91030-4792

068 230 06 07 2 **(DUP)**
MITCHEL CARYL C CHARITABLE
1600 HUNTINGTON DR
SOUTH PASADENA CA 91030-4792

098 113 01 00 9
MOBIL OIL CORP
PO BOX 64106
SPRING TX 77387-4106

068 220 42 00 0 **(PROJECT)**
O DONNELL OIL & SECURITIES CO
1900 DALROCK RD
ROWLETT TX 75088-5526

085 110 06 00 9
ORYX ENERGY CO
P O BOX 1330
HOUSTON TX 77251-1330

068 220 49 00 1
PACIFIC COAST ENERGY
ACQUISITIONS LLC
1 RIVERWAY STE 1025
HOUSTON TX 77056

068 220 52 00 9 **(DUP)**
PACIFIC COAST ENERGY ACQ LLC
1 RIVERWAY STE 1025
HOUSTON TX 77056

068 220 75 00 6 **(DUP)**
PACIFIC COAST ENERGY ACQ LLC
1 RIVERWAY STE 1025
HOUSTON TX 77056

068 220 76 00 9 **(DUP)**
PACIFIC COAST ENERGY ACQ LLC
1 RIVERWAY STE 1025
HOUSTON TX 77056

068 220 20 03 3
PACIFIC GAS & ELECTRIC CO
1 MARKET PZ STE 400
SAN FRANCISCO CA 94105-1004

068 200 40 00 8
PAPENHAUSEN KATHLEEN CLANCY
PO BOX 1032
PEBBLE BEACH CA 93953-1032

068 200 41 00 1 **(DUP) (PROJECT)**
PAPENHAUSEN KATHLEEN CLANCY
PO BOX 1032
PEBBLE BEACH CA 93953-1032

085 130 09 01 3
RICE ROBERT J ET AL
P O BOX 82515
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DENVER CO 80202-5631

068 220 58 00 7 **(DUP)**
SAN PABLO BAY PIPELINE COMPANY
370 17TH ST STE 3100
DENVER CO 80202-5631

068 220 05 01 2
SENTINEL PEAK RESOURCES CAL
1200 DISCOVERY DR STE 500
BAKERSFIELD CA 93309

085 110 17 00 1 **(DUP)**
SENTINEL PEAK RESOURCES CAL
1200 DISCOVERY DR STE 500
BAKERSFIELD CA 93309

085 210 09 00 7 **(DUP)**
SENTINEL PEAK RESOURCES CAL
1200 DISCOVERY DR STE 500
BAKERSFIELD CA 93309

085 210 27 00 9 **(DUP)**
SENTINEL PEAK RESOURCES CAL
1200 DISCOVERY DR STE 500
BAKERSFIELD CA 93309

085 230 12 00 1 **(DUP)**
SENTINEL PEAK RESOURCES CAL
1200 DISCOVERY DR STE 500
BAKERSFIELD CA 93309

085 230 43 00 1 **(DUP)**
SENTINEL PEAK RESOURCES CAL
1200 DISCOVERY DR STE 500
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098 111 05 00 7 **(DUP)**
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BAKERSFIELD CA 93309

098 111 16 00 9 **(DUP)**
SENTINEL PEAK RESOURCES CAL
1200 DISCOVERY DR STE 500
BAKERSFIELD CA 93309

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SENTINEL PEAK RESOURCES CAL
1200 DISCOVERY DR STE 500
BAKERSFIELD CA 93309

098 120 12 00 3 **(DUP)**
SENTINEL PEAK RESOURCES CAL
1200 DISCOVERY DR STE 500
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098 120 41 00 7 **(DUP)**
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1200 DISCOVERY DR STE 500
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098 120 42 00 0 **(DUP)**
SENTINEL PEAK RESOURCES CAL
1200 DISCOVERY DR STE 500
BAKERSFIELD CA 93309

098 120 43 00 3 **(DUP)**
SENTINEL PEAK RESOURCES CAL
1200 DISCOVERY DR STE 500
BAKERSFIELD CA 93309

098 120 44 00 6 **(DUP)**
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VALLEY AG HOLDING LLC
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068 210 51 00 3
WESTERVELT ECOLOGICAL SERV
3636 AMERICAN RVR DR LOWR
SACRAMENTO CA 95864-5956

068 230 05 02 4
WHEELER ROBINSON A &
JACQUELYN APPELL TRUST
2006 ROSEMARY CT
MARTINEZ CA 94553

068 230 06 02 7 **(DUP)**
WHEELER ROBINSON A &
JACQUELYN APPELL TRUST
2006 ROSEMARY CT
MARTINEZ CA 94553

85 190 20 00 3
WONDERFUL CITRUS II LLC
4050 7TH STANDARD RD
SHAFER CA 93263

069 150 08 00 9
WONDERFUL CITRUS LLC
4050 7TH STANDARD RD
SHAFTER CA 93263

085 190 12 00 0 **(DUP)**
WONDERFUL CITRUS LLC
4050 7TH STANDARD RD
SHAFTER CA 93263

068 200 15 00 6
WONDERFUL NUT ORCHARDS LLC
6801 E LERDO HW
SHAFTER CA 93263-9610

068 200 32 00 5 **(DUP)**
WONDERFUL NUT ORCHARDS LLC
6801 E LERDO HW
SHAFTER CA 93263-9610

068 200 33 00 8 **(DUP) (PROJECT)**
WONDERFUL NUT ORCHARDS LLC
6801 E LERDO HW
SHAFTER CA 93263-9610

068 200 58 00 1 **(DUP)**
WONDERFUL NUT ORCHARDS LLC
6801 E LERDO HW
SHAFTER CA 93263-9610

068 200 59 00 4 **(DUP)**
WONDERFUL NUT ORCHARDS LLC
6801 E LERDO HW
SHAFTER CA 93263-9610

068 200 68 00 0 **(DUP)**
WONDERFUL NUT ORCHARDS LLC
6801 E LERDO HW
SHAFTER CA 93263-9610

085 110 48 00 1 **(DUP)**
WONDERFUL NUT ORCHARDS LLC
6801 E LERDO HW
SHAFTER CA 93263-9610

085 190 19 00 1 **(DUP)**
WONDERFUL NUT ORCHARDS LLC
6801 E LERDO HW
SHAFTER CA 93263-9610

085 190 26 00 1 **(DUP)**
WONDERFUL NUT ORCHARDS LLC
6801 E LERDO HW
SHAFTER CA 93263-9610

085 190 29 00 0 **(DUP)**
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6801 E LERDO HW
SHAFTER CA 93263-9610

085 210 33 00 6 **(DUP)**
WONDERFUL NUT ORCHARDS LLC
6801 E LERDO HW
SHAFTER CA 93263-9610

085 210 36 00 5 **(DUP)**
WONDERFUL NUT ORCHARDS LLC
6801 E LERDO HW
SHAFTER CA 93263-9610

085 210 42 00 2 **(DUP) (PROJECT)**
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6801 E LERDO HW
SHAFTER CA 93263-9610

085 320 26 00 8 **(DUP)**
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068 200 16 01 8 **(PROJECT)**
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Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P. O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # 2023060293

Project Title: CarbonFrontier CCS Project by Aera Energy, LLC

Lead Agency: Kern County Planning and Natural Resources Department — Contact Person: Keith Alvidrez

Mailing Address: 2700 "M" Street Suite 100 — Phone: (661) 862-5015

City: Bakersfield — Zip: 93301 — County: Kern

Project Location: County: Kern — City/Nearest Community: Community of Lost Hills

Cross Streets: Lerdo Highway and State Highway 33 — Zip Code: 93249 / 93251

Lat. / Long.: 35.49980° N, -119.75522° W (NAD 83) — Total Acres: 13,362

Assessor's Parcel No.: Multi — Section: Multi — Twp.: Multi — Range: Multi — Base: SBB&M

Within 2 Miles: State Hwy #: SR-33 — Waterways: N/A

Airports: N/A — Railways: N/A — Schools: N/A

Document Type:

CEQA: ☐ NOP ☒ Draft EIR — NEPA: ☐ NOI — Other: ☐ Joint Document
☐ Early Cons ☐ Supplement/Subsequent EIR ☐ EA ☐ Final Document
☐ Neg Dec (Prior SCH No.) ☐ Draft EIS ☐ Other
☐ Mit Neg Dec Other ☐ FONSI

Local Action Type:

☐ General Plan Update ☐ Specific Plan ☒ Rezone ☐ Annexation
☐ General Plan Amendment ☐ Master Plan ☐ Prezone ☐ Redevelopment
☐ General Plan Element ☐ Planned Unit Development ☒ Use Permit ☐ Coastal Permit
☐ Community Plan ☐ Site Plan ☐ Land Division (Subdivision, etc.) ☐ Other:

Development Type:

☐ Residential: Units Acres
☐ Office: Sq.ft. Acres Employees
☐ Commercial: Sq.ft. Acres Employees
☐ Industrial: Sq.ft. Acres Employees
☐ Educational
☐ Recreational

☐ Water Facilities: Type MGD
☐ Transportation: Type
☐ Mining: Mineral
☐ Power: Type MW
☐ Waste Treatment: Type MGD
☐ Hazardous Waste: Type
☒ Other: Carbon Capture and Storage (CCS)

Project Issues Discussed in Document:

☒ Aesthetic/Visual ☐ Fiscal ☒ Recreation/Parks ☒ Vegetation
☒ Agricultural Land ☒ Flood Plain/Flooding ☒ Schools/Universities ☒ Water Quality
☒ Air Quality ☒ Forest Land/Fire Hazard ☒ Septic Systems ☒ Water Supply/Groundwater
☒ Archeological/Historical ☒ Geologic/Seismic ☒ Sewer Capacity ☒ Wetland/Riparian
☒ Biological Resources ☒ Minerals ☒ Soil Erosion/Compaction/Grading ☒ Wildlife
☐ Coastal Zone ☒ Noise ☒ Solid Waste ☒ Growth Inducing
☒ Drainage/Absorption ☒ Population/Housing Balance ☒ Toxic/Hazardous ☒ Land Use
☒ Economic/Jobs ☒ Public Services/Facilities ☒ Traffic/Circulation ☒ Cumulative Effects
☒ Other GHG, Wildfire, Tribal Cultural Resources, Energy

Present Land Use/Zoning/General Plan Designation: Oil and Gas Exploration and Production / A (Exclusive Agriculture), A-1 (Limited Agriculture, NR (20) (Natural Resources – 20 acre min) / 8.1 (Intensive Agriculture), 8.3 (Extensive Agriculture), 8.4 (Mineral and Petroleum), 8.1/2.5 (Intensive Agriculture – Flood Hazard Overlay), 8.3/2.5 (Extensive Agriculture – Flood Hazard Overlay), 8.4/2.5 (Mineral and Petroleum – Flood Hazard Overlay).

Project Description: The proposed project would construct and operate a CCS facility for permanent underground storage of up to 40 million metric tons of carbon dioxide (CO_2) in the storage space (referred to as the 64 Zone reservoir) on approximately 12,362 surface acres in the North and South Belridge oilfield in unincorporated Kern County. The CCS facility would be comprised of four (4) CO_2 capture sites which consist of one (1) pre-combustion and three (3) post-combustion sources, up to nine (9) Class VI underground injection control (UIC) wells, up to eight (8) monitoring wells, and approximately 14.5 miles of CO_2 facility pipelines.

The proposed CCS project would capture CO_2 from an initial source of existing produced gas streams (pre-combustion) and emissions from existing stationary sources (post-combustion) within the South Belridge Oil Field and transport the CO_2 through a facility pipeline to the North Belridge oilfield for injection at up to the nine (9) dedicated Class VI UIC wells. The proposed CO_2 underground storage pace, which is approximately 2,290 acres in size (maximum modeled CO_2 plume area), would be located within the North Belridge oilfield within the CCS Surface Land Area rights held by Aera

Energy and other private owners. Oil and gas production activities would cease within the established CCS underground geologic formation where CO_2 would be stored, prior to commencement of the proposed project.

Implementation of the proposed project includes the following requests :

- Zone Change Cases (ZCC No. 4, Map No 51, ZCC No. 3, Map No. 74, and ZCC No. 4, Map No. 75) from A-1 (limited Agriculture) to A (Exclusive Agriculture) on approximately 1,737 acres and from A/NR (Natural Resources – 20-acre minimum) to A (Exclusive Agriculture) on approximately 47 acres.

- Conditional Use Permits (CUP No. 9, Map 51, CUP No. 10, Map 51; CUP No. 7, Map 74; CUP No. 9, Map 74; CUP No. 7, Map 75; CUP No. 11, Map 75; CUP No. 9, Map 96) to permit the construction and operation of the CCS facility on approximately 12,362 acres with site installation of nine (9) Class VI UIC injection wells, up to eight (8) CO_2 monitoring wells, one (1) downhole seismic monitoring station, transport of CO_2 by facility pipeline, and the construction and operation of accessory infrastructure for CO_2 storage capacity of up to 40 million metric tons of CO_2 within the A (Exclusive Agriculture) Zone District.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "**X**".
If you have already sent your document to the agency, please denote that with an "**S**".

S	Air Resources Board	S	Office of Emergency Services
	Boating & Waterways, Department of		Office of Historic Preservation
	California Highway Patrol	S	Office of Public-School Construction
S	CalFire		Parks & Recreation
S	Caltrans District # 6		Pesticide Regulation, Department of
S	Caltrans Division of Aeronautics		Public Utilities Commission
	Caltrans Planning (Headquarters)	S	Regional WQCB # Central
	Central Valley Flood Protection Board	S	Resources Agency
	Coachella Valley Mountains Conservancy		S.F. Bay Conservation & Development Commission
	Coastal Commission		San Gabriel & Lower L.A. Rivers and Mtns Conservancy
	Colorado River Board		San Joaquin River Conservancy
S	Conservation, Department of		Santa Monica Mountains Conservancy
	Corrections, Department of		State Lands Commission
	Delta Protection Commission		SWRCB: Clean Water Grants
	Education, Department of	S	SWRCB: Water Quality
S	Energy Commission		SWRCB: Water Rights
S	Fish & Game Region # Fresno		Tahoe Regional Planning Agency
	Food & Agriculture, Department of	S	Toxic Substances Control, Department of
	General Services, Department of	S	Water Resources, Department of
	Health Services, Department of		
	Housing & Community Development		Other
	Integrated Waste Management Board		Other
S	Native American Heritage Commission		

Local Public Review Period (to be filled in by lead agency)

Starting Date June 28, 2024 Ending Date July 18, 2024

Lead Agency (Complete if applicable):

Consulting Firm:
Address:
City/State/Zip:
Contact:
Phone:

Applicant:
Address:
City/State/Zip:
Phone

Signature of Lead Agency Representative: **/s/** **Date:** 6/28/2024

Keith Alvidrez, Planner II

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

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Chapter 1
Executive Summary

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Chapter 1
Executive Summary

1.1 Introduction

The Aera CarbonFrontier Project (project) proposed by Aera Energy LLC (Aera Energy, or project proponent) would request the approval of a Zone Change Case (ZCC No. 4, Map No 51, ZCC No. 3, Map No. 74, and ZCC No. 4, Map No. 75) from A-1 (Limited Agriculture) to A (Exclusive Agriculture) on approximately 1,737 acres and from A/NR (Natural Resources – 20-acre minimum) to A (Exclusive Agriculture) on approximately 47 acres and the approval of a Conditional Use Permit (CUP) (CUP No. 9, Map No. 51, CUP No. 7, Map No. 74, CUP No. 7, Map No. 75, CUP No. 9, Map No. 96, CUP No. 10, Map No. 51, CUP No. 9, Map No. 74, CUP No. 11, Map No. 75) for the construction and operation of an approximately 12,362-acre carbon capture and storage (CCS) facility with related capture facilities and pipeline for carbon dioxide (CO2) captured from existing sources within the South Belridge oilfield. The facility would be composed of four carbon dioxide (CO_2) locations of collection: one pre-combustion (Pre-C) and three post-combustion (Post-C) sources; up to nine U.S. Environmental Protection Agency (EPA) Class VI Underground Injection Control (UIC) wells; up to eight monitoring wells; approximately 14 miles of underground facility pipeline; the CCS Surface Land Area associated with a Storage Space; and related infrastructure improvements for the capture, transfer, and storage of carbon dioxide (CO_2).

Kern County, as the Lead Agency under the California Environmental Quality Act (CEQA), has prepared this Draft Environmental Impact Report (EIR). The Draft EIR provides information about the environmental setting and impacts of the project and alternatives. It informs the public about the project and its impacts and provides information to meet the needs of local, State, and federal permitting agencies that are required to consider the project. The EIR will be used by Kern County to determine whether to approve the requested CUPs and associated changes in zoning designations.

This Chapter 1, *Executive Summary*, summarizes the CEQA Statute and Guidelines, provides an overview of the project alternatives, identifies the purpose of this Draft EIR, outlines the potential impacts of the project and the recommended mitigation measures, and discloses areas of controversy and issues to be resolved.

1.2 Project Summary

The process of CCS involves capturing carbon from the atmosphere or an emitting industrial facility and storing it underground (for example, in a depleted oil and gas field). Under high pressure, the captured gas reacts with other subterranean chemicals and water to mineralize, turning to rock.

The source of CO_2 for injection as part of this project would be the Pre-C produced field gas stream from South Belridge oilfield and Post-C flue gas. In addition to Aera internal sources of CO_2, the project would have the capacity to receive CO_2 from outside sources.

The proposed CCS project would capture CO_2 from an initial source of existing produced gas streams (Pre-C) and emissions from existing stationary sources (Post-C) within the South Belridge oilfield and transport the CO_2 through a facility pipeline to the North Belridge oilfield for injection at up to nine dedicated Class VI UIC wells. The proposed CO_2 underground Storage Space, which is approximately 2,290 acres in size (maximum modeled CO_2 plume area), would be in the North Belridge oilfield within the CCS Surface Land Area rights held by Aera Energy and other private owners. Oil and gas production activities would cease within the underground geologic formation where CO_2 would be stored, prior to commencement of the project.

1.2.1 Discretionary Entitlements Required

The Kern County Planning and Natural Resources Department as the Lead Agency (according to CEQA Guidelines Section 15052) for the proposed project has staff responsibility for the preparation of the EIR and recommendations to the decision makers on the proposed project. To implement this project, the project proponent may need to obtain discretionary and government permits/approvals including the following:

Federal

- EPA UIC – Class VI Permit
- U.S. Fish and Wildlife Service Section 10 Incidental Take Permit and Habitat Conservation Plan (if required)

State

- California Department of Fish and Wildlife
- Section 2081 Permit (State-listed endangered species) (if required)
- 401 Water Quality Certification Central Valley Regional Water Quality Control Board
- Waste Discharge Requirements
- National Pollution Discharge Elimination System Construction
- State Fire Marshal Approval of CO_2 Pipeline
- California Department of Conservation
- California Department of Conservation, Geologic Energy Management Division
- California Air Resources Board (CARB)
- Permit for Transport of Oversized Loads (if required)

Local

- Certification of Final EIR
- Adoption of 15091 Findings of Fact and 15093 Statement of Overriding Considerations
- Adoption of Mitigation Monitoring and Reporting Program
- Kern County Planning and Natural Resources Department - Certification of Final EIR, ZCC, CUP, Adoption of 15091 Findings of Fact and 15093 Statement of Overriding Considerations, Adoption of Mitigation Monitoring and Reporting Program
- Approval of Grading Permits
- Approval of Kern County Building Permits
- Approval of Kern County Encroachment Permits (if required)
- San Joaquin Valley Air Pollution Control District
  - Approval of Fugitive Dust Control Plan
  - Authority to Construct

Other applicable permits or approvals from responsible agencies may be required for the project.

1.3 Purpose And Use of the Draft EIR

An EIR is a public informational document used in the planning and decision-making process. This project-level EIR analyzes the environmental impacts of the proposed project. The Kern County Planning Commission and Board of Supervisors will consider the information in the EIR, including public comments and staff responses to those comments, during the public hearing process. The final decision is made by the Kern County Board of Supervisors, who may approve, conditionally approve, or deny the project. The purpose of an EIR is to identify the following:

- The significant potential impacts of the project on the environment and the manner in which those significant impacts can be avoided or mitigated
- Any unavoidable adverse impacts that cannot be mitigated
- Reasonable and feasible alternatives to the project that would eliminate any significant adverse environmental impacts or reduce the impacts to a less-than-significant level

An EIR also discloses growth-inducing impacts, impacts found not to be significant, and significant cumulative impacts of past, present, and reasonably anticipated future projects. CEQA requires preparation of an EIR that reflects the independent judgment of the Lead Agency regarding the impacts, the level of significance of the impacts both before and after mitigation, and mitigation measures proposed to reduce the impacts. A Draft EIR is circulated to Responsible Agencies, Trustee Agencies with resources affected by the project, and interested agencies and individuals.

The purposes of public and agency review of a Draft EIR include sharing expertise, disclosing agency analyses, checking for accuracy, detecting omissions, discovering public concerns, and soliciting counterproposals. Reviewers of a Draft EIR are requested to focus on the sufficiency of the document in identifying and analyzing the possible impacts on the environment and ways in which the significant impacts of the project might be avoided or mitigated. Comments are most helpful when they suggest additional specific alternatives or mitigation measures that would provide better ways to avoid or mitigate significant environmental effects.

This Draft EIR is being distributed directly to agencies, organizations, and interested groups and persons for comment during a 45-day formal review period (exclusive of the County Winter Recess) in accordance with Section 15087 of the CEQA Guidelines. The EIR process, including means by which members of the public can comment on the EIR, is discussed further in Chapter 2, *Introduction*.

1.4 Project Overview

This section describes the local and regional setting, surrounding land uses, project objectives, and project characteristics. The project is described in further detail in Chapter 3, *Project Description*.

1.4.1 Regional Setting

The project area encompasses land located in the western extent of the valley region of the unincorporated area of Kern County, California. The County's geography includes mountainous area, agricultural lands, and deserts. Kern County is California's third largest County in land area and encompasses 8,202 square miles with the current estimated population being 914,193 residents.

The project site is located within the unincorporated area of Kern County and within the administrative boundary of the Belridge oilfields. Combined, the two oilfields cover an area approximately 13 miles long and 3 miles wide (Figure 3-2: Project Location Map). The oilfields are predominantly developed with oil and gas production and accessory facilities and infrastructure. The primary operator within both oilfields is Aera Energy LLC. The proposed CO_2 capture facilities would be located within the developed portion of the South Belridge oilfield. The proposed injection wells, monitoring wells, and CO_2 Underground Storage Area would be located in the North Belridge oilfield. New aboveground facility pipelines would transect both oilfields.

The nearest urbanized areas to the boundary of the CCS Surface Land Area and Underground Storage Area for the project are Bakersfield city center (approximately 36 miles), the City of Wasco (approximately 22 miles), the City of Taft (approximately 29 miles), and the unincorporated communities of Buttonwillow (approximately 17 miles), McKittrick (approximately 15 miles), and Lost Hills (approximately 7 miles).

The project site is crossed by several public utilities, including several Pacific Gas and Electric (PG&E) electric transmission line corridors.

1.4.2 Surrounding Land Use and Project Site Conditions

The project site is located within the Belridge oilfields (Belridge oilfields) on approximately 12,362 acres of privately owned land used for oil and gas exploration and production. Table 3-2 identifies the existing Land Use designations, Adopted General Plan Map Code Designations, and Existing Zoning for the project site and for areas north, south, east, and west of the project site.

Existing land use in the vicinity of the project site generally includes oil and gas exploration and production, grazing, and agricultural lands. The closest property, at 17059 West Side Highway, Lost Hills, California, is located approximately 0.6 miles away from the booster station and approximately 400 feet east of the project boundary. The second closest residences to the project site are two small housing tracts (consisting of about 28 homes) on Lost Hills Road, north of Lerdo Highway, roughly 3.5 miles east of the project site, including one residence located at 17863 Lost Hills Road, McKittrick, California, which is 3.12 miles from the nearest CO_2 capture facility. The community of Lost Hills is located seven miles northeast of the project site. Lost Hills Wonderful Park, a local park, is located approximately seven miles northeast of the nearest injection well. Schools near the project site are listed in Table 3-3. See Section 4.11, Land Use and Planning, for mapping and additional information.

The nearest public airport to the CUP boundary is the Buttonwillow-Elk Hills Airport, which is approximately 14 miles southeast of the project site. The proposed project is not located within an Airport Sphere of Influence, per the Kern County Airport Land Use Compatibility Plan.

1.4.3 Applicant-Provided Project Objectives

Section 15124(b) of the CEQA Guidelines requires that a project description includes a statement of the objectives of a project that addresses the purpose. The following specific objectives have been identified by the project proponent for the proposed project:

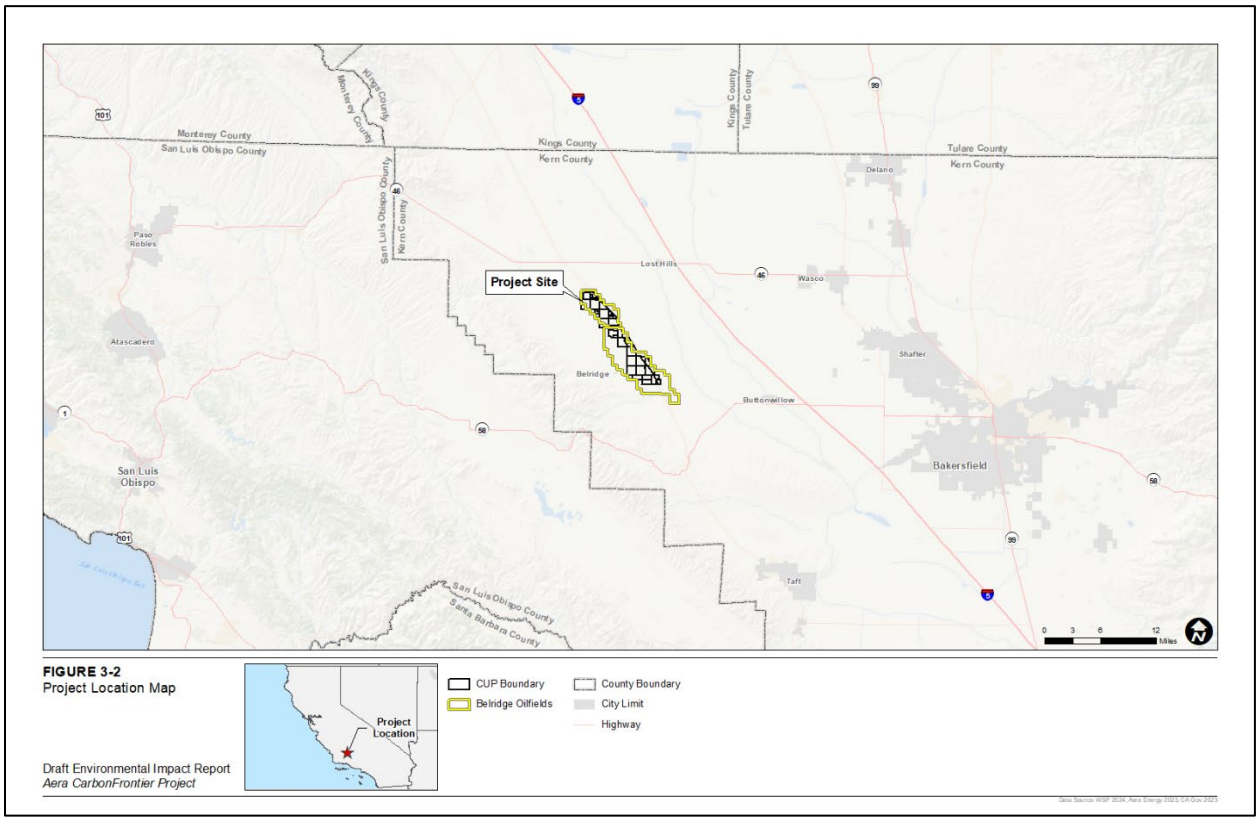
- Construct and operate facilities and infrastructure to capture, transport, inject, and permanently store up to 40 million metric tons of CO_2 in a safe, secure, and economically feasible manner for storage, not enhanced recovery
- Minimize new disturbance by siting and designing project facilities and infrastructure within the existing developed oilfield footprint that are consistent with current Kern County and California guidelines
- Reduce the carbon intensity of Aera Energy's produced oil and gas by capturing CO_2 from produced gas (Pre-C) and stationary sources (Post-C)
- Generate environmental, social, and economic benefits for Kern County and the State of California by implementing low carbon technologies, developing CCS infrastructure, and providing living-wage jobs in the region

- Contribute to California's goal to achieve carbon neutrality by 2045 (Executive Order B-55-18) by integrating carbon capture in existing operations as well as ending oil and gas production from select reservoirs and repurposing them for the permanent storage of CO_2

1.4.4 Project Characteristics

Project elements are shown on Figure 1-1 and include capture facilities, facility pipelines, and injection and monitoring wells (including seismic monitoring wells), which are described in detail in Chapter 3, *Project Description.*

Figure 1-1: Site Plan



Source of CO_2

The initial source of CO_2 for injection as part of this project includes Pre-C produced gas stream and Post-C flue gas. Proposed CO_2 capture facilities include the separation, dehydration, compression, and cooling of CO_2 from one facility for Pre-C produced gas stream and from three facilities for Post-C flue gas.

Proposed CO_2 capture and processing facilities include the separation, dehydration, compression, and cooling of CO_2 from flue gas emissions from existing stationary sources within South Belridge. A Post-C capture facility would be constructed at each of the three existing facilities: Cogen 32,

SGS 2972, and SGS 2868. The flue gas emissions from each Post-C source would be ducted to its own CO_2 capture and processing facility.

No additional sources of CO2 or new development are proposed for the CCS Surface Land Area at this time. Any possible future additional sources of CO2 are described in Chapter 3, *Project Description*.

Capture Technology

Pre-C Capture

A physical solvent or a traditional amine absorption or similar process would be used to remove the CO_2 from the Pre-C produced gas stream. In the CO2 capture facility, the produced gas stream would be passed through an absorber column where the absorbent would chemically react with and bind over 90 percent of the incoming CO_2. The rich absorbent carrying the CO_2 would be piped to a regenerator column, and through the combination of reduced pressure and applied heat, the CO_2 would be released from the absorbent and captured in nearly pure concentration. Following the CO_2 release, the reconstituted absorbent would be recycled back to the absorber column. The captured CO_2 would then be cooled, compressed, and pumped by pipeline to the permitted Class VI injection wells to be stored in the underground Approved Storage Space located within the North Belridge oilfield.

Post-C Capture

Post-C facilities would be constructed at three existing facilities within the South Belridge oilfield: COGEN 32, SGS 2868, and SGS 2972. Flue gas from each Post-C source would be ducted to its own CO_2 capture facility. CO_2 would be captured using an amine absorption process or similar process. The concentrated CO_2 would then be compressed, dehydrated, and stripped of oxygen.

Similar to the Pre-C facility, each Post-C facility will include three main towers of varying height, but none taller than 140 feet, and 16 to 37 feet in diameter. The towers may be split into parallel units of smaller diameters. Supporting this facility will be several heat exchangers, transfer pumps, compressors, and storage area for make-up chemicals.

Pump Stations

A new booster pump station or stations may be constructed adjacent to the existing Compressor Station 49, at each of the Post-C recovery sites, or within Gas Conditioning Facility 32. The pumps will be situated at (1) the point source for the CO2 (for example, Gas Conditioning Facility 32, COGEN 32, SGS 2972) or (2) adjacent to Compressor Station 49 where the CO2 Distribution Manifold will be placed. The design flow rate for the booster pump station is expected to be between 1.6 and 3.3 million metric tons per year.

Transport of CO_2: Facility Pipeline

After CO_2 is captured from the four source locations described above, the CO2 will be transported via facility pipeline to Class VI UIC injection wells. A new 10-mile, 6- to 12-inch facility pipeline would be constructed primarily aboveground on pipe supports to deliver CO_2 from the capture facilities to the proposed injection wells. The main CO_2 pipeline will be constructed aboveground to allow for ease of monitoring, inspection, and maintenance, including early detection of damage or corrosion. The new CO_2 facility pipeline would generally follow existing pipeline corridors and contained within the existing oilfield. The facility pipeline would be primarily installed aboveground, approximately 2 to 4 feet aboveground surface, except where the pipeline would cross main access roads within the oilfield properties.

Distribution piping, 4.7 miles long and approximately 4- to 8-inches in size, would extend from the main pipeline to the proposed injection wells. These distribution pipelines would be primarily aboveground on pipe supports, except where the pipelines cross main access roads within the oilfield, where it would be installed belowground. The pipelines would be installed belowground at the main access road crossings.

The aboveground pipeline sections would be placed on aboveground metal pipeline supports. Each support would have a concrete foundation approximately 6 to 8 feet deep. The pipe would rest on the pipe supports, which would be spaced at approximately 20-foot intervals along the pipeline length. Where pipelines are placed belowground at internal access road crossings, the proposed pipelines would be installed using conventional trenching techniques.

Geologic Formations/Storage Reservoir

In support of the EPA Class VI application, Aera Energy has fully characterized the EPA Area of Review, which will become the EPA-Approved Storage Area, for suitability by integrating static data that includes over 100 well logs, a static three-dimensional geologic model, as well as dynamic data capable of predicting the subsurface behavior of injected CO_2. The proposed injection zone is the “64 Zone” Sandstones of the Lower Temblor Formation. A 90-year record of production and injection data along with reservoir pressure measurements throughout this time provide evidence that the 64 Zone within North Belridge oilfield is an isolated compartment, bounded by sealing faults.

Injection Wells

A total of nine injection wells would be utilized for the proposed project, including four new injection wells and five existing repurposed wells, in compliance with EPA UIC regulations. Refer to Appendix E-2 for the Class VI UIC Application submitted to the EPA, including the attachment showing the Injection Well Design document. This document includes the well-specific construction details, procedures, design criteria, current and planned wellbore schematics, and well surveys for all planned Class VI CO_2 injection and monitoring wells.

Monitoring Wells

Five existing wells are proposed to monitor the CO_2 injection operations and ensure that the CO_2 injection remains within the 64 Zone reservoir. Monitoring wells neither produce nor inject fluids. Up to an additional three monitoring wells (locations to be determined) may be proposed, pending further evaluation. Monitoring wells would be used to monitor temperature, pressure, fluid levels, acoustic signals. The wells would also be used for the collection of fluid and gas samples throughout the project and for 10 years after cessation of injection, after which the site will be closed. Monitoring well construction details are described in the UIC Class VI permit application that was submitted to the EPA, included as Appendix E-2.

1.5 Environmental Impacts

CEQA Guidelines Section 15128 requires that an EIR contains a brief explanation of why any new and possibly significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR. The County has engaged the public to participate in the scoping of the environmental document.

The contents of this EIR are based on a notice of preparation (NOP) that was prepared in accordance with the CEQA Guidelines and on public and agency input that was received during the scoping process. Comments received on the NOP are located in Appendix A of this EIR.

1.5.1 Impacts Not Further Considered in this EIR

Based on the findings of the NOP and the results of scoping, a determination was made that this EIR must contain a comprehensive analysis of all environmental issues identified in CEQA Guidelines Appendix G. No resource areas were eliminated from discussion through the Initial Study.

1.5.2 Impacts of the Project

Sections 4.1 through Section 4.20 in Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures*, provide a detailed discussion of the environmental setting, impacts associated with the project, and mitigation measures designed to reduce significant impacts to less-than-significant levels when feasible. The impacts, mitigation measures, and residual impacts for the project are summarized in Table 1-3*,* located at the end of this chapter, and are discussed further in this subsection.

Impacts related to the following resource areas are evaluated in this EIR for their potential significance:

- Aesthetics and Visual Resources
- Agricultural and Forest Resources
- Air Quality
- Biological Resources
- Cultural Resources

- Energy
- Geology and Soils
- Greenhouse Gas (GHG) Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation
- Tribal Cultural Resources
- Utilities and Service Systems
- Wildfire

Environmental Effects Found to be Less Than Significant

After further study and environmental review in this EIR, direct and indirect impacts of the project would be less than significant or could be reduced to less-than-significant levels with mitigation measures for the following issue areas:

- Aesthetics and Visual Resources
- Agricultural Resources
- Biological Resources
- Cultural Resources
- Energy
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation and Traffic
- Tribal Cultural Resources
- Utilities and Service Systems
- Wildfire

Significant and Unavoidable Adverse Impacts

Section 15126.2(b) of the CEQA Guidelines requires that the EIR describe any significant impacts, including those that can be mitigated but not reduced to less-than-significant levels. Potential environmental effects of the proposed project and proposed mitigation measures are discussed in detail in Chapter 4 of this EIR.

As shown in Table1-1, impacts in the following areas would be significant and unavoidable, even with the incorporation of feasible mitigation measures.

Table 1-1: Summary of Significant and Unavoidable Impacts of the Project

Resources	Project Impacts	Cumulative Impacts
Aesthetics	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on aesthetic and visual resources. Even with mitigation, the project has the potential to contribute to cumulative impacts within the region with the additions of the injection wells, monitoring wells, and capture facilities equipment. The cumulative impacts of the project, when combined with other known and unknown projects, are **cumulatively significant and unavoidable**. All reasonable and feasible mitigation measures have been evaluated and included.
Agricultural Resources	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on agricultural resources. Based on the countywide loss of agricultural land due to the Groundwater Sustainability Act, reduction in water for agricultural use, drought conditions, and urban growth patterns, the loss is considered cumulatively considerable. The cumulative impacts of the project, when combined with other known and unknown projects, are **cumulatively significant and unavoidable**. All reasonable and feasible mitigation measures have been evaluated and included.
Air Quality	The project's total emissions would	The project, in combination with

Table 1-1: Summary of Significant and Unavoidable Impacts of the Project

Resources	Project Impacts	Cumulative Impacts
	exceed the San Joaquin Valley Air Pollution Control District thresholds for NO_X, PM_{10}, and $PM_{2.5}$, for which the project region is nonattainment under an applicable federal or State ambient air quality standard. The project would expose sensitive receptors to substantial pollutant concentrations. With the implementation of MM 4.3-1 through MM 4.3-9, the impact would remain **significant and unavoidable.**	other existing or reasonably foreseeable projects, could result in cumulative impacts on air quality resources. Because the project's specific emissions would contribute to Kern County's 2020 emissions inventory and to the 2025 projected emissions of Kern County, the project's incremental effects on air quality would be cumulatively considerable and, even with mitigation, this potentially significant cumulative impact would be **cumulatively significant and unavoidable**. All reasonable and feasible mitigation measures have been evaluated and included.
Biological Resources	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on biological resources. Although the cumulative impacts from CCS projects will be less due to the CCS Surface Land Use restrictions, other clean energy projects that are sited in the valley portion of Kern County have the potential to impact species and reduce habitats. The cumulative impacts of the project, when combined with other known and unknown projects, are **cumulatively significant and unavoidable**. All reasonable and feasible mitigation measures have been evaluated and included.
Cultural Resources	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on cultural resources. Given the depths needed for the Underground Injection Control Class IV injection wells, the potential for destruction of unknown cultural resources is possible. Given the size and scope of oil and gas activities in the unincorporated area, and the impacts of this project at depths where cultural resources cannot be

Table 1-1: Summary of Significant and Unavoidable Impacts of the Project

Resources	Project Impacts	Cumulative Impacts
		assessed, cumulative impacts to cultural resources are considered cumulatively considerable. The cumulative impacts of the project, when combined with other known and unknown projects, are **cumulatively significant and unavoidable**. All reasonable and feasible mitigation measures have been evaluated and included.
Energy	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on energy resources. The cumulative impacts on the regional grid, which have not been determined to meet the CARB 2045 goals for production, are **cumulatively significant and unavoidable** after all feasible and reasonable mitigation.
Geology and Soils	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on geologic resources. Due to the uncertainty of the implementation of multiple projects and the ability to simultaneously cease injection during a seismic event, the impacts from cumulative induced seismic activity from this project plus any future permitted CCS project are **cumulatively significant and unavoidable**. All reasonable and feasible mitigation measures have been evaluated and included.
Greenhouse Gases	The project has the potential to generate GHG emissions, either directly or indirectly, which may have a significant impact on the environment and conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. With the implementation of MM 4.8-1 and MM 4.8-2, the impact would remain **significant and unavoidable**.	The geographic scope for cumulative impacts for GHGs for the project is the San Joaquin Valley Air Basin. Climate change impacts are inherently global and cumulative, and not project specific. While implementation of MM 4.8-1 and MM 4.8-2 would encourage reduction in GHG emissions at a regional level, they do not provide a mechanism that guarantees GHG emission reductions on a cumulative basis.

Table 1-1: Summary of Significant and Unavoidable Impacts of the Project

Resources	Project Impacts	Cumulative Impacts
		The project's cumulative contribution to GHG emissions after implementation of the recommended mitigation measures would remain **cumulatively significant and unavoidable**.
Hydrology and Water Quality	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on groundwater supply. As the Kern County subbasin is currently over drafted and the West Kern Water District's Groundwater Sustainability Plan has been deemed inadequate, along with the other Kern subbasin plans where the other similar known and unknown projects could occur, the cumulative impacts of any use of groundwater in the area are considered **cumulatively significant and unavoidable** after all feasible and reasonable mitigation.
Mineral Resources	The project could result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State. The loss of oil reservoir in the project area is considered a significant loss of oil, which is considered a mineral of value to the State. No feasible mitigation measures are proposed, and impacts would remain **significant and unavoidable**.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on mineral resources. The loss of oil reservoir as part of the project is considered a significant loss of mineral resources. No feasible mitigation measures are proposed, and impacts would remain **significant and unavoidable**.
Noise	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on noise. Project activities would have to implement MM 4.13-1 if there are sensitive human noise receptors within 4,000 feet of a well to ensure that the noise levels do not exceed 65 dBA. Potentially significant cumulative noise impacts could occur, even if noise levels associated with project activities plus surrounding oil and gas activities are under 65 dBA,

Table 1-1: Summary of Significant and Unavoidable Impacts of the Project

Resources	Project Impacts	Cumulative Impacts
		depending on the location of another nearby project, its noise levels, and the distance to a sensitive noise receptor. The project's cumulative contribution to noise impacts after implementation of the recommended mitigation measures would remain cumulatively **significant and unavoidable**.
Utilities and Service Systems	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on utilities and service systems in regard to groundwater supply. As the Kern County subbasin is currently over drafted and the West Kern Water District's Groundwater Sustainability Plan has been deemed inadequate, along with the other Kern subbasin plans where the other similar known and unknown projects could occur, the cumulative impacts of any use of groundwater in the area are considered **cumulatively significant and unavoidable** after all feasible and reasonable mitigation.

Key:
CARB = California Air Resources Board
CCS = carbon capture and storage
GHG = greenhouse gas
MM = mitigation measure
NO_X = nitrogen oxides
PM = particulate matter
State = State of California

1.5.3 Significant Cumulative Impacts

According to Section 15355 of the CEQA Guidelines, the term cumulative impacts "refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." Individual effects that may contribute to a cumulative impact may result from a single project or a number of separate projects. Individually, the impacts of a project may be relatively minor, but when considered along with impacts of other closely related or nearby projects, including newly proposed projects, the effects could be cumulatively considerable.

This EIR considers the potential cumulative effects of the proposed project. Impacts for the following issue areas have been found to be cumulatively considerable:

- Aesthetics and Visual Resources
- Agricultural Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology and Soils (Seismic)
- Greenhouse Gases
- Hydrology and Water Quality (Groundwater Supply)
- Mineral Resources
- Noise
- Utilities and Service Systems (Groundwater Supply)

Each of these significant cumulative impacts is discussed in the applicable sections of Chapter 4, *Environmental Settings, Impacts, and Mitigation Measures.*

1.5.4 Growth Inducement

The Kern County General Plan (KCGP) recognizes that certain forms of growth are beneficial, both economically and socially. CEQA Guidelines Section 15126.2(d) identifies a project as growth-inducing if it "would foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment."

Growth inducement can be a result of new development that requires an increase in employment levels, removes barriers to development, or provides resources that lead to secondary growth. With respect to employment, the project would not induce substantial growth. Construction staff who are not local would likely be housed in existing communities. Project operations would include five regular full-time employees and an additional five full-time employees could be on site at any time if repairs or other maintenance work is required. It is expected that some of these individuals would already reside in the area and project operations would not result in a substantial influx of people —such as a new residential development, school, or other use that would result in large volumes of people residing near or traveling to the project site. Therefore, the project is not likely to induce any growth within Kern County.

1.5.5 Energy Conservation

To ensure that energy implications are considered in project decisions, CEQA requires that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy (see Public Resources Code Section 21100(b)(3)). According to Appendix F of the CEQA Guidelines, the goal of conserving energy implies the wise and efficient use of energy, including decreasing overall per capita energy consumption, decreasing reliance on natural gas and oil, and increasing reliance on renewable energy sources.

As discussed in Section 4.6, *Energy*, energy resources in the forms of diesel and gasoline fuel would be consumed by the use of off-road equipment and on-road vehicles during construction of the project. Temporary electricity may be required to provide as-necessary lighting and electric equipment. The amount of electricity used during construction would be minimal. Natural gas is not anticipated to be required during construction of the project. Overall, construction activities associated with the proposed project would result in the consumption of petroleum-based fuels. However, there are no unusual project characteristics that would necessitate the use of construction equipment or vehicles that would be less energy-efficient than those at comparable construction sites in other parts of the State of California (State). Therefore, it is expected that construction fuel consumption associated with the proposed project would not be any more inefficient, wasteful, or unnecessary than at other construction sites in the region.

During operation, most on-site equipment (for example, pumps, maintenance, monitoring, communications) for the Pre-C oilfield gas would be powered by electricity from the on-site co-generation facility and supplemented by PG&E, as needed. Although the project would result in increased demand for energy resources, the energy would be consumed efficiently and would be typical of the current state of industrial carbon capture projects. Projections of energy use described in Section 4.6, *Energy*, for the total electricity needed for the project are based on the current technology (amine) and do not represent the newer forms of carbon capture, which include conservation measures to reduce the electric demand. Therefore, the projections are conservative and will be lower when other sources are permitted for injection into the project. As the State phases out oil and gas extraction and replaces gas power plants and fossil fuel industry sources with newer carbon capture facilities and renewable energy sources, such as solar (required for many forms of financing), the project would meet the requirements of Appendix F of the CEQA Guidelines.

The project would consume energy resources during construction and operations. Implementation of the project would support industrial operations that use renewable energy, decrease reliance on fossil fuels, including natural gas, and become more efficient in the use of electricity. The State's policies outlined in Senate Bill (SB) 905 and the ban on enhanced oil recovery with CO_2 ensure that the goals of Appendix F in sources for the injection will be more efficient.

1.5.6 Irreversible Impacts

Section 15126.2(c) of the CEQA Guidelines defines an irreversible impact as an impact that uses nonrenewable resources during the initial and continued phases of the project. Irreversible impacts can also result from damage caused by environmental accidents associated with a project. Irretrievable commitments of resources should be evaluated to ensure that such consumption is justified.

Build-out of the project would commit nonrenewable resources during project construction. During project operations, oil, gas, and other fossil fuels and nonrenewable resources would be consumed, primarily in the form of transportation fuel for project employees. Therefore, an irreversible commitment of nonrenewable resources would occur as a result of long-term project operations. However, assuming that those commitments occur in accordance with the adopted goals, policies, and implementation measures of the KCGP as a matter of public policy, those commitments have been determined to be acceptable. The KCGP ensures that any irreversible environmental changes associated with those commitments will be minimized to the extent feasible.

1.6 Alternatives to the Proposed Project

Section 15126.6 of the CEQA Guidelines states that an EIR must address "a range of reasonable alternatives to the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." Based on the significant and unavoidable impacts of the project, the aforementioned objectives established for the project, and the feasibility of the alternatives considered, a range of alternatives is analyzed in the next subsection and discussed in detail in Chapter 6, *Alternatives*, of this Draft EIR.

1.6.1 Alternatives Considered and Rejected

Kern County considered several alternatives to reduce the project's significant and unavoidable impacts. According to CEQA, the Lead Agency may make an initial determination as to which alternatives are feasible and warrant further consideration, and which are infeasible. The following alternatives were initially considered but were eliminated from further consideration in this EIR because they do not meet project objectives or were infeasible.

Drilling Ban on All Lands "Leave It in the Ground" Alternative

A drilling ban on all land would implement a "leave it in the ground" alternative. This alternative extends beyond denying or modifying the project to a policy decision to amend Chapter 19.98 of the Zoning Ordinance to prohibit all oil and gas exploration, development, and production activities within the project area. Further, it would require that existing oil and gas wells and all facilities relying on that production and being considered for the CCS project would be required to cease, and all affected land would be required to be restored to its pre-exploration condition. This

alternative assumes that the ban extends to the UIC Class VI wells needed for injection as well. An alternative in which another source not related to fossil fuel production is used for the CCS project, such as initial source direct air capture (DAC), is analyzed in Section 6.8.2, *Alternative 2 – Initial Source Direct Air Capture Alternative*. This alternative is outside the scope of the privately funded project under consideration and does not meet three out of the five project objectives.

Further, the environmental impacts of construction activities to remove and restore land used for oil and gas exploration, extraction, and production by the industry in Kern County, encompassing over 596,199 acres for just the administrative oilfield, would exceed all the thresholds and project-specific impacts of this project in all categories. CEQA requires alternatives to reduce one or more impacts that are significant and unavoidable to less than significant. Although the production of various criteria pollutants and CO_2 from the use of the fuel would be reduced, the reduction would be offset from the remediation activities. In addition to failing to meet most of the project objectives, an alternative that completely bans all new oil and gas exploration, development, and production activities is infeasible because of existing legal restrictions on the County's authority to prohibit access to subsurface mineral interests without liability. Since the Drilling Ban on All Lands Alternative is legally infeasible and would not achieve most of the project's basic objectives, and it is beyond the scope of the project and this EIR, it is rejected for analysis in this EIR.

Off-site Alternative

The Off-site Alternative would carry out the project in a different location, outside of the San Joaquin Air Basin. The project site, however, was selected because of its proximity to the location of oil and gas resources and infrastructure within the County. As explained in Chapter 3, *Project Description*, the project area was selected because it encompasses the portion of the County in which oil and gas development has historically occurred, as the process of CCS involves capturing carbon from existing point sources within an existing oil and gas field and storing it underground (for example, in a depleted oil and gas reservoir).

Furthermore, the selection of the project site was predicated upon the capacity of the preexisting infrastructure to effectively fulfill the project's objectives while limiting the impact on surrounding land use. All new CCS facilities, including wells, pipelines, and ancillary infrastructure, would be operated in areas in which oil and gas activity is currently the primary land use and therefore a compatible land use. There are also no established residential communities within or adjacent to the project area.

The Alternative would place the CCS facility outside the San Joaquin Air Basin to reduce the determination of significant and unavoidable impacts on air quality based on higher thresholds. The Mojave Air Basin, though in attainment for a number of criteria pollutants and therefore with higher thresholds, has no oil and gas production and therefore has no underground pore space suitable for a CCS project. Thus, this alternative is technically infeasible, and it is therefore rejected for analysis.

It should also be noted that, although CEQA requires an EIR to identify project alternatives, it does not require the EIR to identify alternative project locations. According to the CEQA Guidelines, an

EIR must include a reasonable range of "alternatives to the project, *or* to the location of the project" (14 California Code of Regulations [CCR] Section 15126.6(a), emphasis added). Applicable case law recognizes that CEQA grants Lead Agencies flexibility to elect to analyze either onsite or off-site alternatives, or both (see *Mira Mar Mobile Community* v. *City of Oceanside*, 119 California Fourth District Court of Appeal 447, 491 [2004]). There is no requirement under CEQA that an EIR always explore an off-site alternative (see *California Native Plant Society* v. *City of Santa Cruz*, 177 California Fourth District Court of Appeal 957, 933 [2009]). Thus, CEQA does not require this EIR to analyze the Off-site Alternative.

1.6.2 Alternatives Selected for Analysis

Alternatives that would avoid or substantially lessen any of the significant effects of the project and feasibly attain most of the basic project objectives are evaluated below. The alternatives are discussed with respect to their relationship to the project's objectives. Kern County has considered the following three alternatives, which are also identified in Table 1-2 and discussed individually as follows:

- Alternative 1 – No Project Alternative
- Alternative 2 – Initial Source Direct Air Capture Alternative
- Alternative 3 – Nature-Based Carbon Storage Alternative

Alternative 1: No Project Alternative

As required by CEQA Guideline §15126.6, this chapter describes and analyzes a "no project" alternative for the purpose of comparing the impacts of approving the project with the impacts of not approving the project. Alternative 1, the No Project Alternative, thus assumes that the project's 12,362-acre CCS facility consisting of EPA Class VI UIC wells, 14.7 miles of underground facility pipelines, and related infrastructure improvements for the capture, transfer, and storage of CO_2 would not be approved or constructed. Accordingly, Alternative 1 assumes that the necessary approval of multiple CUPs to allow for the construction and operation of the CCS underground site installation of one Pre-C and three Post-C sources, up to nine Class VI injection wells, up to eight monitoring wells, and construction of accessory infrastructure with a CO_2 storage capacity of 40 million metric tons; and related changes in zoning from A-1 (Limited Agriculture) to A (Exclusive Agriculture) and from NR to A (Exclusive Agriculture) would not be approved for project construction and operation.

Moreover, the No Project Alternative would not result in up to 40 million metric tons of concentrated CO_2 storage capacity. The No Project Alternative also would not support California's Executive Order B-55-18 for California to achieve carbon neutrality by 2045 and net-negative emissions thereafter.

Finally, the No Project Alternative would maintain the current zoning, land use classifications, and existing land uses, which consist mostly of existing oil and gas exploration and production, including existing well pads, processing facilities, pipeline routes, and access roads, along with

undeveloped desert vegetation. The project site would continue to be used for oil and gas extraction. The identified wells on schedule for abandonment under the project would not be abandoned early and would instead be abandoned on the eight-year idle well plan regulations.

Alternative 2: Initial Source Direct Air Capture Alternative

Under Alternative 2, the project proponent would not capture the gas from the oilfield as the initial source but instead use a DAC system at an unknown location off site to capture atmospheric CO_2 emissions in place of a conventional amine-based capture system. DAC is a technology that captures CO_2 directly from the atmosphere, usually through a mechanical system, although some passive capture techniques are also being developed. In a mechanical system, fans or wind are used to drive ambient air through a contactor unit, in which the air passes across a chemical sorbent that selectively reacts with and traps CO_2, allowing the other components of the air to pass through and exit the system. Currently, the most developed adsorbent materials are in liquid or solid forms (Kern County Carbon Management Business Park – Report 2023, Appendix K-2).

DAC is an engineered equivalent to photosynthesizing plants, except that DAC captures CO_2 from the atmosphere at a faster rate and with a much smaller land footprint than biomass (a nature-based solution; refer to Alternative 3). Furthermore, DAC delivers CO_2 in a pure, compressed form. Captured atmospheric CO_2 can be permanently and safely stored in geologic reservoirs to deliver negative emissions or be used to produce low carbon intensity products, such as synthetic fuels that work in existing vehicles and infrastructure.

Current DAC technologies are primarily distinguished by using one of two types of sorbents: liquid solvents (L-DAC) and solid sorbents (S-DAC). In both techniques, DAC pulls air from the atmosphere and passes it over the sorbent material. The sorbent material captures the carbon dioxide, and the rest of the air passes through and exits the DAC unit. L-DAC typically uses hydroxide solutions (a liquid solvent) as the bonding sorbent, whereas S-DAC relies on a CO_2 "filter" or dry amine-based chemical sorbents. In both cases, the CO_2 from the air is chemically bound into a new compound, and then is subsequently broken down to release a high-purity stream of CO_2 for storage and the original sorbent components for reuse.

Both technologies require electricity and heat to operate; the electricity drives the fans and controls inlet systems, and the heat releases the trapped CO_2. However, S-DAC requires temperatures of only about 100 degrees Celsius (ºC) to break the chemical bonds linking the CO_2 to the sorbent material, whereas L-DAC requires temperatures around 900 ºC. Such temperatures are difficult to reach using renewable energy sources like wind or solar. If natural gas is used to attain the necessary heat, the associated CO_2 released from the use of L-DAC technology would need to be recaptured and stored to avoid counteracting the benefit of DAC.

Although the direct land footprint of DAC is smaller than that of alternative carbon removal processes, DAC requires renewable energy to operate, which results in large amounts of commercial scale solar. A DAC capable of generating 1 million tpy of CO_2 for injection would require over 1,600 acres of land (228 megawatts) of energy. This land use would be in addition to the 9,130 acres required for the carbon capture area.

DAC facilities are expected to produce zero or near-zero on-site emissions on site that could be hazardous to the environment or human health. Hazardous waste is not a significant concern for DAC facilities.

Wastewater is also not generated in significant amounts in DAC processes, as the only water used is contained within closed-loop systems. Some DAC operations actually produce water as part of the process. Solid waste buildup can occur in the CO_2 recovery equipment, as happens in traditional monoethanolamine scrubbers that are used for point source carbon capture. Similar environmental regulation and disposal guidelines would need to be followed. Chemicals used in sorbent plants would degrade over time as heat is applied to release captured CO_2, but those degradation products (for example, ammonia) are expected to be contained within the DAC plant and not released into the environment. Additionally, they have established regulation and disposal protocols.

L-DAC requires approximately 2.8 MWh (megawatt-hours) of energy for every metric ton of CO_2 captured (estimates range from 1.8 to 3.7 MWh per metric ton of CO_2). Each L-DAC contactor unit captures about 300 to 600 metric tpy, and units are modular and stackable. Thus, footprints vary depending on how high units are stacked or how they are spread out. To capture 1 million metric tons of CO_2 per year, a facility would require an estimated 200 acres of space. Reported estimates range from 50 to 1,730 acres, depending on how contactor units are arranged.

Like the project, Alternative 2 would amend Zoning Ordinance Chapter 19.98 to rezone from A-1 to A for the carbon capture project and seek approval of the CCS facility with the initial source of a DAC facility. The Alternative also would require construction of injection and facility pipelines and injection and monitoring wells, just as would be required under the proposed project.

Alternative 3: Nature-Based Carbon Storage Alternative

Alternative 3, the Nature-Based Carbon Storage Alternative, would replace the mechanical capture of CO_2 and storage in the underground oil and gas reservoir rock layer with the planting of trees or another type of appropriate crop in order to store atmospheric CO_2. Currently, the proposed project site is located within the Belridge oilfields, which are existing oil and gas fields characterized by extensive oil and gas exploration and production, including existing well pads, processing facilities, pipeline routes, and access roads. Under this alternative, the project proponent would have to cease and remove all oil and gas exploration and production equipment within the Belridge oilfields and then utilize the area for a nature-based carbon storage alternative. The most applicable nature-based carbon storage alternative for the area of the project site would be regenerative agriculture, as it coincides with the current zoning.

Tree planting would be one example of regenerative nature-based carbon storage for the highest ability to store atmospheric carbon. If approximately 12,000 acres of the project site were remediated of all oil and gas facilities and prepared for planting, an estimated 400 to 1,000 trees per acre could be planted, resulting in a new forest area of 4.8 million to 12 million trees. The type of tree and planting configuration will affect the species selected. Characteristics of the best trees for carbon removal, instead of cover crops, include the use of fast-growing trees, as they store the most carbon during the first decades of their lifespan and act as carbon sinks; trees with wide

crowns and large leaves that are best for efficient photosynthesis; and the selection of native tree species that are compatible with local soil and disease-resistant trees that require no fertilizers.

Environmentally Superior Alternative

Identification of an environmentally superior alternative is required under CEQA (CCR Section 15126.6[e][2]). Alternative 1, the No Project Alternative, would be environmentally superior to the project on the basis of minimizing or avoiding physical environmental impacts, but it would have greater impacts on GHG emissions than would the project. Section 15126.6(e)(2) of the CEQA Guidelines states that if the No Project Alternative is found to be environmentally superior, "the EIR shall also identify an environmentally superior alternative among the other alternatives." Although Alternative 1 is the environmentally superior alternative relative to certain issue areas, it is not capable of meeting any of the project objectives. Because of its substantial reduction of impacts on GHG emissions and its ability to meet most of the project objectives, Alternative 2, Initial Source DAC, is considered the environmentally superior alternative.

Alternative 2, the Initial Source Direct Air Capture Alternative, reduces the significant and unavoidable GHG emissions impacts of the project and would substantially reduce operational stationary source air emissions. Due to its larger footprint, this alternative would have greater impacts on aesthetics, biological resources, cultural resources, noise, and tribal cultural resources than the project would. Alternative 2 would continue to have significant and unavoidable impacts on mineral resources, and cumulative effects on agricultural and forest resources, air quality, geological resources, hydrology, and utilities, similar to the project. Although Alternative 1 would have fewer and less severe significant impacts than Alternative 2, Alternative 2 would achieve most of the project's objectives as described above.

Table 1-2: Summary Comparison of Alternative Impacts

Issue Area	**Project** Summary of Impacts	**Alternative 1** No Project Alternative	**Alternative 2** Initial Source Direct Air Capture Alternative	**Alternative 3** Nature-Based Carbon Storage Alternative
Aesthetics and Visual Resource	Less than significant	Less than project	Greater than project	Less than project
Agricultural and Forest Resources	Less than significant	Less than project	Greater than project	Same as project
Air Quality	Significant and Unavoidable	Less than project	Construction: Greater than project Operational: Less than project	Less than project
Biological Resources	Less than significant	Less than project	Greater than project	Same as project
Cultural Resources	Less than significant	Less than project	Greater than project	Same as project
Energy	Less than significant	Same as project	Same as project	Less than project
Geology and Soils	Less than significant	Less than project	Same as project	Less than project
Greenhouse Gas Emissions	Significant and Unavoidable	Greater than project	Less than project	Less than project
Hazards and Hazardous Materials	Less than significant	Same as project	Same as project	Same as project
Hydrology and Water Quality	Less than significant	Less than project	Same as project	Less than project
Land Use and Planning	Less than significant	Same as project	Same as project	Same as project
Mineral Resources	Significant and Unavoidable	Less than project	Same as the project	Same as the project
Noise	Less than significant	Same as project	Less than project	Less than project
Population and Housing	Less than significant	Same as project	Same as project	Less than project
Public Services	Less than significant	Less than project	Same as project	Less than project
Recreation	Less than significant	Same as project	Same as project	Less than project

Table 1-2: Summary Comparison of Alternative Impacts

Issue Area	Project Summary of Impacts	Alternative 1 No Project Alternative	Alternative 2 Initial Source Direct Air Capture Alternative	Alternative 3 Nature-Based Carbon Storage Alternative
Transportation and Traffic	Less than significant	Same as project	Same as project	Less than project
Tribal Cultural Resources	Less than significant	Less than project	Greater than project	Less than project
Utilities and Service Systems	Less than significant	Less than project	Same as project	Greater than the project (water supply)
Wildfire	Less than significant	Same as project	Same as project	Greater than the project

1.7 Areas of Known Controversy

Areas of controversy were identified through written agency and public comments received during the scoping period. Public comments received during the scoping period are summarized in Chapter 2, *Introduction*, and provided in Appendix A-2. In summary, the following issues were identified during scoping and are addressed in the appropriate sections of Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures*:

- Coordination and consultation with California Native tribes and compliance with Assembly Bill 52 and SB 18
- Special status species and rare biological resources present in the project area as well as federally listed species
- Evaluation of construction and operational emissions
- Air quality concerns for criteria pollutants and safety of operations
- Concerns about the use of CCS to capture GHG from fossil fuel sources

1.8 Issues to Be Resolved

Section 15123(b) (3) of the CEQA Guidelines requires that an EIR contain issues to be resolved, which include the choices among alternatives and whether or how to mitigate significant impacts. The major issues to be resolved regarding a project include decisions by the Lead Agency:

- Determine whether the Draft EIR adequately describes the environmental impacts of the project
- Select a preferred choice among alternatives
- Determine whether the recommended mitigation measures should be adopted or modified
- Determine whether additional mitigation measures need to be applied to the project

1.9 Summary of Environmental Impacts and Mitigation

Table 1-3, below, summarizes the environmental impacts of the project, mitigation measures, and unavoidable significant impacts identified and analyzed in Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures*, of this EIR.

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
• **Aesthetics**	•	•	•	•
Impact 4.1-1 Have a Substantial Adverse Effect on a Scenic Vista	Less than significant	No mitigation measures are proposed.	Less than significant	Less than significant
Impact 4.1-2 Substantially Damage Scenic Resources, including, but not limited to, Trees, Rock Outcroppings, and Historic Buildings within a State Scenic Highway	Less than significant	No mitigation measures are proposed.	Less than significant	Less than significant
Impact 4.1-3 Substantially Degrade the Existing Visual Character or Quality of the Site and its Surroundings	Potentially Significant	**MM 4.1-1** All derricks, boilers, and other drilling equipment used to drill, repair, clean out, deepen, or redrill any well shall be removed from the drill site within 90 days after completion or after abandonment of any well. Earthen sumps used in drilling shall be filled within 90 days after any well has been placed in production (unless such sumps are to be used within six months for the drilling of another well), and any sump used in productions shall be filled after its abandonment and restored to a uniform grade within ninety days. **MM 4.1-2** Sumps and ponds shall be permitted only to the extent authorized by the Central Valley Regional Water Quality Control Board (via waiver, Waste Discharge Requirements, or other form of authorized written documentation) and shall comply with all applicable legal requirements and mitigation measures for sumps serving as storage, percolation or evaporation ponds for produced water. **MM 4.1-3** Project signage is limited to directional, warning, safety, security, and identification signs in connection with oil, gas, or other hydrocarbon drilling and development operations in accordance with Chapter 19.84.135 of the Kern County Zoning Ordinance. **MM 4.1-4** Prior to issuance of a building, grading or implementation of a U.S. Environmental Protection Agency permit to construct, a Project Boundary Signage Plan for the CCS Surface Land Area shall be submitted. The plan shall include the size and wording on signs that create virtual access to a map that shows the CCS Surface Land Area and notes the existence of a CO_2 storage area underground. The sign shall also include a phone number and email. The plan shall include the spacing of the physical signage around the entire perimeter of the CCS Surface Land Area approved in the permit.	Less than significant	Significant and unavoidable
Impact 4.1-4 Create a New Source of Substantial Light or Glare that Would Adversely Affect Day or Nighttime Views in the Area	Potentially significant	**MM 4.1-5** All new lighting, including permanent nighttime lighting, safety, security, and operational lightening, shall comply with the standards in Kern County Zoning Chapter 19.81 – Outdoor Lighting "Dark Sky Ordinance."	Less than significant	Less than significant
Impact 4.1-5 Contribute to Cumulative Aesthetic Impacts	Potentially Cumulatively considerable	Implement **MM 4.1-1** through **4.1-5**, as described above.	Significant and unavoidable	Significant and unavoidable

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
• **Agricultural Resources**	•	•	•	•
Impact 4.2-1 Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) to Non-Agricultural Use	Potentially significant	**MM 4.2.-1** Prior to any use of any portion of the CCS Surface Land Area for agricultural cultivation, the CCS owner/operator shall provide the following for review and approval to the Kern County Planning and Natural Resources Department: a. A site plan showing the location of the agricultural operations within the CCS Surface Land Area that includes a written signed statement from the CCS owner/operator of the following requirements: 1. No activities are being authorized for the agricultural lease that would involve drilling of any water wells or other exploratory activities that would penetrate the confined cap layer to cause a leak. 2. No use of the buffer area around the injection well sites is included in any agricultural cultivation or related operations. 3. Acknowledgment that the farming operation has been informed and has a binding agreement to not conduct any activities near or in proximity to either the injection well sites or the capture facilities that would damage the fencing or equipment and a Worker Awareness Program for the farming employees of the use of the underground for CO_2 storage. 4. That any lease for agricultural cultivation is bound by all applicable requirements of the project CUP and EIR Mitigation Monitoring and Reporting Plan.	Less than Significant	Significant and unavoidable
Impact 4.2-2 Conflict with Existing Agricultural Zoning or Williamson Act Contracts	No impact	No mitigation measures are required.	No impact	Less than significant
Impact 4.2-3 Conflict with Existing Zoning for, or Cause Rezoning of, Forest Land or Timberland	No impact	No mitigation measures are required.	No impact	No impact
Impact 4.2-4 Result in the Loss of Forest Land or Conversion of Forest Land to Non-Forest Use	No impact	No mitigation measures are required.	No impact	No impact
Impact 4.2-5 Result in the Cancellation of an Open Space Contract Made Pursuant to the California Land Conservation Act of 1965 or Farmland Security Zone Contract for Any Parcel of 100 or More Acres	No impact	No mitigation measures are required.	No impact	No impact

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
Impact 4.2-6 Cumulative Impacts to Agricultural or Forest Resources	Potentially significant	Implement mitigation measure **MM 4.2-1**.	Significant and unavoidable	Significant and unavoidable
• **Air Quality**	•	•	•	•
Impact 4.3-1 Conflict With or Obstruct Implementation of the Applicable Air Quality Plan	Potentially significant	**MM 4.3-1** Consistent with the requirements of the SJVAPCD Regulation II-Permits, the owner/operator shall obtain an ATC permit and a PTO for any facility or equipment requiring a permit from the SJVAPCD, such as stationary sources required to obtain permits pursuant to District Rule 2010. All emissions increases from permitted equipment shall comply with District Rule 2201. **MM 4.3-2** The owner/operator shall develop and implement a Fugitive Dust Control Plan in compliance with SJVAPCD fugitive dust suppression regulations. The Fugitive Dust Control Plan shall include: a. Name(s), address(es), and phone number(s) of person(s) responsible for the preparation, submission, and implementation of the plan. Description and location of operation(s). Listing of all fugitive dust emissions sources included in the operation. The following dust control measures shall be implemented: 1. All on-site unpaved roads shall be effectively stabilized using water or chemical soil stabilizers that can be determined to be as efficient as or more efficient for fugitive dust control than CARB approved soil stabilizers, and that shall not increase any other environmental impacts including loss of vegetation. 2. All material excavated or graded will be watered to prevent excessive dust. Watering will occur as needed with complete coverage of disturbed areas. The excavated soil piles will be watered as needed to limit dust emissions to less than 20 percent opacity or covered with temporary coverings. 3. Construction activities that occur on unpaved surfaces will be discontinued during windy conditions when winds exceed 25 miles per hour and those activities cause visible dust plumes that exceed the SJVAPCD 20-percent opacity standard. 4. Track-out debris onto public paved roads shall not extend 50 feet or more from an active operation and track-out shall be removed or isolated such as behind a locked gate at the conclusion of each workday, except on agricultural fields where speeds are limited to 15 mph. 5. All hauling materials should be moist while being loaded into dump trucks. 6. All haul trucks hauling soil, sand, and other loose materials on public roads shall be covered (with tarps or other enclosures that would reduce fugitive dust emissions). 7. Soil loads should be kept below 6 inches or the freeboard of the truck. 8. Drop heights when loaders dump soil into trucks shall not exceed 5 feet above the truck. 9. Gate seals should be tight on dump trucks. 10. Traffic speeds on unpaved roads shall be limited to 25 miles per hour.	Less than significant	Significant and unavoidable

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		11. All grading activities shall be suspended when visible dust emissions exceed 20 percent. 12. Other fugitive dust control measures as necessary to comply with SJVAPCD Rules and Regulations. 13. Disturbed areas shall not exceed those shown on the Site Plan. 14. Disturbed areas should be re-vegetated as soon as possible after disturbance if area is no longer needed for oil and gas activities. **MM 4.3-3** All off-road construction diesel engines not registered under CARB's Statewide Portable Equipment Registration Program, which have a rating of 50 horsepower or more, shall meet, at a minimum, the Tier 3 California Emission Standards for Off-road Compression-Ignition Engines as specified in CCR, Title 13, section 2423(b)(1) unless that such engine is not available for a particular item of equipment. In the event a Tier 3 engine is not available for any off-road engine larger than 100 horsepower, that engine shall be equipped with retrofit controls that would provide nitrogen oxides and PM emissions that are equivalent to Tier 3 engine. a. All equipment shall be turned off when not in use. Engine idling of all equipment shall be limited to five minutes, except under exemptions specified in CCR Title 13 Section 2449(d)(2)(A). b. All equipment engines shall be maintained in good operating condition and in proper tune per manufacturers' specifications. **MM 4.3-4** To further reduce emissions of oxides of nitrogen from on-road heavy-duty diesel haul vehicles: a. 2007 engines or pre-2007 engines shall comply with CARB retrofit requirements set forth in CCR Title 13 Section 2025. b. All on-road construction vehicles, except those meeting the 2007/California Air Resources Board-certified Level 3 diesel emissions controls, shall meet all applicable California on-road emission standards and shall be licensed in the State of California. This does not apply to worker personal vehicles. c. All on-road construction vehicles shall be properly tuned and maintained in accordance with the manufacturers' specifications.		
Impact 4.3-2 Result in a Cumulatively Considerable Net Increase of Any Criteria Pollutant for Which the Project Region is Non-Attainment Under an Applicable Federal or State Ambient Air Quality Standard	Potentially significant	**MM 4.3-5** Prior to issuance of any grading or construction permits the owner/operator shall enter into a DMA with the SJVAPCD. The DMA is to mitigation criteria emissions of the CCS project implementation, not required to be offset under a District rule as described in MM 4.3-1, and for project vehicle and other mobile source emissions. The owner/operator shall pay fees to fully offset project emissions of NOx (oxides of nitrogen), ROG, PM10 (particulate matter of 10 microns or less in diameter), and PM2.5 (particulate matter of 2.5 microns or less in diameter) (including as applicable mitigating for reactive organic gases by additive reductions of particulate matter of 10 microns or less in diameter) (collectively, "designated criteria emissions") to avoid any net increase in these pollutants. The air quality mitigation fee shall further be paid prior to the approval of any construction or grading approval and shall be used to reduce designated criteria emissions to fully offset project emissions that are not otherwise required to be fully offset by District permit rules and regulations.	Significant and unavoidable.	Significant and unavoidable

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		a. Examples of feasible air emission reduction activities that may be funded by air quality fees paid by the owner/operator or proposed and implemented by the owner/operator under the emission reduction agreement include the following: 1. Replacing or retrofitting diesel-powered stationary equipment such as motors on generators, pumps and wells with electric or other lower-emission engines that are not subject to Title V reductions. 2. Replacing or retrofitting diesel-powered school, transit, municipal and other community mobile sources such as buses, car fleets, and maintenance equipment, with electric or other lower-emission engines. 3. Reducing emissions from public infrastructure sources such as water and wastewater treatment and conveyance facilities and reducing water-related emissions through water conservation and reclamation. 4. Funding lower-emission equipment and processes for local businesses, schools, non-profit and religious institutions, hospitals, city and county facilities, including electric vehicle charging facilities and electric vehicle transportation options for the selected communities. b. Under the legislative requirements of Section 39741.1 of the California Health and Safety Code all funding shall be used in disadvantaged communities near the CCS project. Unincorporated communities and incorporated cities within a 20-mile radius, measured from the corners of the CCS Surface Land Area are eligible for the use of the funding for qualified projects and shall be known as "Eligible CCS Air Funding Communities ". No funding shall be used outside those areas. c. The owner/operator shall provide an annual payment of $140,000 to the KCPNR Department for the creation of a county managed community liaison position to provide technical support to the Eligible CCS Air Funding Communities and coordination with the SJVAPCD to expedite use of the funding for air mitigation projects. The first payment shall be made 30 days after approval of the DMA by the SJVAPCD. Annual payments shall be made by January 31 in the following years until confirmation by the District that all funding has been expended. d. CARB shall review the Agreement for compliance with requirements of Section 39741.1 of the California Health and Safety Code before execution and adoption.		
Impact 4.3-3 Expose Sensitive Receptors to Substantial Pollutant Concentrations	Potentially significant	The project shall be required to implement **MM 4.7-1**, **MM 4.9-9** and **MM 4.9-10** relative to risks of exposure to CO2 from pipeline rupture. Furthermore, the project would be required to comply with the following mitigation measure for sensitive receptors. **MM 4.3-6** No Class VI or Class II injection well for use in this CCS project shall be located within 4000 feet of any sensitive receptor. **MM 4.3-7** The following measures shall be implemented to address Valley Fever and pandemics: a. Project shall include in the Worker Environmental Awareness Program information on how to recognize the symptoms of Valley Fever and to promptly report suspected symptoms of work-related Valley Fever to a supervisor. A Valley Fever informational handout shall be provided to all on-site construction personnel. The handout shall, at a minimum, provide information regarding the symptoms, health effects, preventative measures, and treatment. Additional information and handouts can be obtained by contacting the Kern County Public Health Services Department. On-site personnel shall be trained on the proper use of personal protective equipment, including respiratory equipment. National Institute for Occupational Safety and Health (NIOSH)-approved respirators shall be provided to on-site personal, upon request as part of the Worker Environmental Awareness Training Program.	Significant and unavoidable	Significant and unavoidable

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		b. A onetime payment of $3,500 shall be made to the Kern County Public Health Services Department for the specific purposes of continued Valley Fever education and outreach. c. Owner/operators shall implement all orders related to the COVID-19 pandemic or any other pandemic mandated by Kern County Public Health on well sites and related to worker safety. **MM 4.3-8** Prior to issuance of any construction or grading permits, the owner/operator shall consult with the SJVAPCD and develop a draft Air Monitoring program for fence line monitoring of all air constituents generated by the CCS project including criteria pollutants, CO_2, and H_2S. The plan shall be reviewed and approved by both the SJV Air District and the CARB, with a draft copy to the EPA UIC Program and the KCPNR Department and implemented before any construction on the CCS facilities can occur. The final approved plan shall be provided to the EPA UIC Program and the KCPNR Department. **MM 4.3-9** Prior to issuance of any grading or construction permits, the owner/operator shall comply with all requirements of the State of California requirements under Section 39741.1 of the California Health and Safety Code. Mitigation Measures that are more restrictive than the final adopted State Framework shall be implemented and cannot be waived by the State Carbon Framework determinations and must be implemented.		
Impact 4.3-4 Result in Other Emissions Such as Those Leading to Odors Adversely Affecting a Substantial Number of People	No impact	No mitigation measures are required.	No impact	No impact
Impact 4.3-5 Result in Other Cumulatively Considerable Air Quality Impacts	Potentially significant	Implement **MM 4.3-1** through **MM 4.3-9**, as described above.	Significant and unavoidable	Significant and unavoidable
• **Biological Resources**	•	•	•	•
Impact 4.4-1 Have a Substantial Adverse Effect, either Directly or through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special Status Species in Local or Regional Plans, Policies, or Regulations or by the California Department of Fish and Wildlife or the United States Fish and Wildlife Service	Potentially significant	The following are requirements for all grading and construction activities on all project components in the defined disturbance area, including all injection wells, abandonment of wells, capture facilities and pipelines. The remaining CCS Surface Land Area that is within the project boundary but has no construction or disturbance is not subject to this requirement. **MM 4.4-1** The following are requirements for all grading and construction activities on all project components in the defined disturbance area, including all injection wells, abandonment of wells, capture facilities and pipelines. The remaining carbon capture and storage (CCS) Surface Land Area that is within the project boundary but has no construction or disturbance is not subject to this requirement. a. **Qualifications:** The owner/operator shall use a qualified biologist for all work on reports submitted for any application for project permit. The qualified biologist must have a Bachelor of Science Degree or Bachelor of Arts Degree in biology or related environmental science, have demonstrated familiarity with the natural history, habitat affinities and identification of Covered Species of the San Joaquin Valley and have conducted work in California for at least one (1) year of field level reconnaissance survey work in the San Joaquin Valley. The resume of the biologist preparing any report submitted for permits shall be included in the report. Lack of these specific qualifications will result in immediate rejection of the report without further review.	Less than significant	Significant and unavoidable

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		b. **Protocol Surveys:** Based on the information gathered from the biological reconnaissance survey and any informal consultation with United States Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW), any required focused/protocol surveys shall be conducted by a qualified biologist consistent with protocol study timelines in advance of submittal of the permit application to determine the presence/absence of sensitive species protected by State and federal Endangered Species Acts and potential project impacts to those species. The survey shall be conducted in accordance with the most current standard protocol of the USFWS and California Department of Fish and Wildlife. The purpose of focused/protocol surveys is to confirm the presence or absence of any species listed as threatened or endangered under the federal Endangered Species Act. Threatened or endangered under the California Endangered Species Act, rare or endangered in the California Native Plant Protection Act or designated as fully protected in the California Fish and Game Code (collectively, "Protected Species"), and to confirm the presence or absence of any other species considered "sensitive" under California Environmental Quality Act ("Sensitive Species"), and to identify and implement avoidance and minimization measures for such species. The surveys shall be conducted in accordance with all currently applicable presence and absence survey and/or species protocols established by the USFWS and the CDFW ("Species Protocols"). In the absence of any approved protocols, the survey shall extend for a minimum of 250 feet from all areas where any ground disturbance activities would occur, provided that permission to access has been obtained. As an alternative to individual pre-disturbance surveys for each application, and after consultation with and concurrence by the CDFW and the USFWS, multiple parcels or areas of CCS activities (including lands which may have multiple surface or mineral ownership) may be consolidated for the purpose of more efficiently managing pre-disturbance surveys and determinations regarding the absence of protected species in areas of proposed new ground disturbance activities. c. **Monitoring:** A biological monitor with the same qualifications as a qualified biologist shall be present during ground-disturbing activities in project locations that have special-status species habitat or are adjacent to potential special-status species habitat. Within 30 days before any ground-disturbing activities in special-status species habitat, the qualified biologist shall conduct a pre-disturbance survey to record existing conditions of the site, determine if conditions have changed since the reconnaissance or focused/protocol surveys were conducted, and to determine where sensitive species avoidance buffers will be established. **MM 4.4-2** **Take Authorization**: No incidental take of any species listed as threatened or endangered under the federal Endangered Species Act, threatened or endangered under the California Endangered Species Act, rare or endangered in the California Native Plant Protection Act, or designated as fully protected in the California Fish and Game Code (Protected Species) may occur unless the incidental take is authorized by applicable State and federal wildlife agencies in the **form of a permit or other written authorization**, an approved State or federal conservation plan, or in accordance with an approved regional plan such as the Draft Valley Floor Habitat Conservation Plan and/or Natural Community Conservation Plan. **MM 4.4-3** **Buffers:** Protective buffers shall be used, where effective in the opinion of the qualified biologist, to avoid any unauthorized incidental take of Protected Species, and to minimize any incidental take of Sensitive Species, by separating the planned disturbance area from any locations where the qualified biologist has detected the presence of Protected Species or Sensitive Species. Protective buffers, as shown in Table 4.4-8, shall be delineated using brightly colored stakes and/or flagging or similar materials and remain until construction activities are complete, at which time of completion the buffers must be removed. Protective buffers shall be established around active dens and/or burrows of special-status animal species, or populations of special-status plant species to avoid unauthorized take of protected species as listed in Table 4.4-8. The protective buffer distance shall be increased if required to avoid unauthorized incidental take of any Protected Species as determined by a qualified biologist. Protective buffer distances and other avoidance measures that		

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

<table>
<tr><th>Impact</th><th>Level of Significance before Mitigation</th><th>Mitigation Measure(s)</th><th>Level of Significance (Project)</th><th>Level of Significance (Cumulative)</th></tr>
<tr><td></td><td></td><td>may be implemented to avoid impacts to Protected Species or Sensitive Species must be consistent with the USFWS and/or the CDFW and shall be implemented and overseen by the qualified biologist.

Table 4.4-1: Disturbance Buffers for Sensitive Resources
<table>
<tr><th>Sensitive Resource</th><th>Buffer Zone from Disturbance (feet)</th></tr>
<tr><td>Potential San Joaquin kit fox den</td><td>50</td></tr>
<tr><td>Known San Joaquin kit fox den</td><td>100</td></tr>
<tr><td>Natal San Joaquin kit fox den</td><td>500</td></tr>
<tr><td>Atypical San Joaquin kit fox den</td><td>50</td></tr>
<tr><td>Rodent burrows</td><td>50</td></tr>
<tr><td>Listed bird species active nests</td><td>0.5 miles</td></tr>
<tr><td>Burrowing owl burrow (breeding and nonbreeding season)</td><td>Pursuant to CDFW guideline</td></tr>
<tr><td>San Joaquin coachwhip, silvery legless lizard, coast horned lizard</td><td>30</td></tr>
<tr><td>American badger:
Non-maternity dens
Maternity dens</td><td>
50
200</td></tr>
<tr><td>Special-status plants</td><td>50</td></tr>
<tr><td>Crotch’s bumble bee</td><td>50</td></tr>
<tr><td>Swainson’s hawk</td><td>500 around nests</td></tr>
<tr><td>Blunt nose leopard lizard
Non-active burrows and clutch sites
Species observation within exclusion fencing</td><td>
50
250</td></tr>
<tr><td>Temblor legless lizard</td><td>30 around unearthed lizard</td></tr>
<tr><td>Northern California legless lizard, California glossy snake, San Joaquin coachwhip, coast horned lizard, and other reptiles</td><td>50</td></tr>
<tr><td>Giant Kangaroo Rat</td><td>50</td></tr>
</table></td><td></td><td></td></tr>
</table>

MM 4.4-4 Occupied burrowing owl burrows shall not be disturbed during the species nesting season (February 1 through August 31). The following distances shall be maintained between all disturbance areas and burrowing owl nesting sites (Table 4.4-9).

Table 4.4-2: Setback Distances for Burrowing Owl Nesting Sites by Level of Proposed Project Impacts

Location		
Nesting sites	Nesting sites	Nesting sites
Time of Year		
April 1–Aug 15	**Aug 16–Oct 15**	**Oct 16–Mar 31**
Project Impact Level		
Low		
656 feet (200 meters)	656 feet (200 meters)	164 feet (50 meters)
Medium		
1,640 feet (500 meters)	656 feet (200 meters)	328 feet (100 meters)
High		
1,640 feet (500 meters)	1,640 feet (500 meters)	1,640 feet (500 meters)

Burrowing owls present in proposed disturbance areas or within 500 feet or as specified under an approved Habitat Conservation Plan (as identified during pre-disturbance surveys) outside of the breeding season (between September 1 and January 31) may be moved away from the disturbance area using passive relocation techniques approved by the CDFW. Passive relocation techniques in the CDFW Staff Report on Burrowing Owl Mitigation Guidelines (California Department of Fish and Game 2012) include installing one-way doors in burrow entrances for 48 hours, to ensure the owl(s) have left the burrow, daily monitoring during the passive relocation period, and collapsing existing burrows to prevent reoccupation. A minimum of one or more weeks would be required to relocate the owl(s) and allow for acclimatization to alternate off-site burrows. Prior to burrow exclusion or eviction, a burrowing owl management plan shall be prepared and approved by the CDFW. Destruction of burrows shall occur only pursuant to a management plan for the species approved by the CDFW; burrow excavation shall be conducted by hand whenever possible.

As an alternative to passive relocation, occupied burrows identified off site within 500 feet of construction activities may be buffered with hay bales, fencing (e.g., sheltering in place), or as directed by the qualified biologist and the CDFW, to avoid disturbance of burrows.

MM 4.4-5 The following are requirements for any and all grading and construction activities on all project components, including all injection wells, abandonment of wells, capture facilities and pipelines:

a. The qualified biologist surveys shall determine whether active bat maternity roosts are located in or within 250 feet of any disturbance area. All active bat maternity roosts shall be avoided during breeding periods, including postponing disturbance activities. If an active Sensitive or Protected Species bat maternity roost location is proposed to be disturbed, the qualified biologist shall consult with, the USFWS and CDFW to identify any additional minimalization measures which the qualified biologist determines with the wildlife agencies can actually be implemented based on field conditions. All such measures must be implemented for project activities.

b. The qualified biologist surveys shall determine if there is any plants that would be disturbed that provide habitat for the Crouch Bumblebee. If such habitat is determined that appropriate surveys shall be required after consultation with CDFW.

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		MM 4.4-6 The following additional measures shall be implemented to avoid and minimize potential significant adverse impacts to Crotch's bumble bee: a. Protocol/focused surveys for Crotch's bumble bee and its requisite habitat features shall be conducted by a qualified biologist during the blooming period immediately prior to project construction following the methodology outlined in the Survey Considerations for California Endangered Species Act Candidate Bumble Bee Species (CDFW 2023). b. If Crotch's bumble bee is detected during biological monitoring or observed at any point, the CDFW and the USFWS shall be notified to determine what additional measures would be necessary to prevent take of the species. c. In the event that complete avoidance of Crotch's bumble bee is not feasible, MM 4.4-2 shall be implemented. **MM 4.4-7** The following additional measures shall be implemented to avoid and minimize potential significant adverse impacts to Temblor legless lizard: a. Protocol/focused and pre-disturbance surveys shall be conducted using a CDFW-approved methodology to determine the presence of Temblor legless lizard at and/or near the project area b. If Temblor legless lizards are detected during protocol/focused surveys, a Temblor legless lizard avoidance plan shall be prepared for the project that will result in avoidance of incidental take. At a minimum, the Temblor legless lizard avoidance plan shall be submitted for approval to the CDFW and the County. c. In the event that complete avoidance of the Temblor legless lizard is not feasible, MM 4.4-2 shall be implemented. **MM 4.4-8** The following avoidance and measures will be implemented to protect Northern California legless lizard, California glossy snake, San Joaquin coachwhip, coast horned lizard, and other reptile species that have potential to occur in the BSA: a. After installation of exclusion fencing, a qualified biologist shall conduct visual preconstruction surveys within the project footprint in areas of suitable habitat no more than 30 days prior to ground-disturbing activities. If any Northern California legless lizard, California gloss snake, San Joaquin coachwhip, coast horned lizard, or other reptiles are observed within exclusion fencing, they will be relocated to suitable habitat outside of the exclusion fencing by a qualified biologist. b. At minimum, a 50-foot avoidance buffer shall be maintained surrounding Northern California legless lizard, California gloss snake, San Joaquin coachwhip, coast horned lizard, or other special-status reptile species unless CDFW agrees to a reduced buffer. **MM 4.4-9** The project proponent shall utilize the measures below to avoid and minimize impacts on Giant Kangaroo Rats (GKR) during Project activities. USFWS/CDFW shall be consulted if the avoidance and minimization measures, including GKR trapping and relocation, vary from what is described below. The project proponent shall then be required to implement any additional measures required by USFWS/CDFW.		

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		a. A qualified biologist with required federal and State permits will conduct small mammal trapping in suitable habitat within the project area to determine presence/absence of GKR. Trapping efforts shall follow the USFWS Survey Protocol for Determining Presence of San Joaquin Kangaroo Rats (USFWS 2013). A survey proposal shall be submitted for review and approval by USFWS/CDFW. Survey results shall be submitted to USFWS/CDFW to determine if a federal biological opinion and State ITP will be required for GKR. b. No more than 14 days prior to construction, the qualified biologist will conduct surveys to identify all potential burrows used by GKR within the disturbance areas and within 50 feet of areas where ground disturbance will occur. c. The qualified biologist will establish a buffer of at least 50 feet around potential GKR burrows to avoid impacts on burrows. The buffer area will be delineated prior to construction activities and marked with brightly colored markers that will be visible to workers as well as signs, stakes, flags, and/or rope or cord. d. The project proponent will leave any undisturbed GKR food stores (e.g., haystacks, seed caches, or other stockpiled forage). If avoidance is not feasible, the qualified biologist will implement measures to keep the food stores intact, including temporarily relocating the food stores and covering seeds with plywood to allow temporary vehicle or on-foot access. e. GKR burrows within the fenced disturbance area will be live trapped prior to surface disturbance or vegetation grubbing activities within that specific temporary exclusion fencing area and relocated. The project proponent's live-trapping and relocation procedures will adhere to a relocation plan for GKR approved by USFWS/CDFW prior to ground disturbance occurring. f. After completion of live trapping, burrows would be fully excavated by hand. Any GKRs encountered will be allowed to escape out of harm's way into adjacent habitat (if present) or, at the discretion of the qualified biologist, will be collected and relocated. g. Trapped or collected GKRs will be relocated within the project area at least 50 feet from ground disturbance areas. Live-trapping and relocation procedures will adhere to a relocation plan for GKR approved by USFWS/CDFW prior to ground disturbance occurring. The qualified biologist will conduct reconnaissance surveys of a potential release site to determine suitability. Artificial burrows and temporary enclosure fencing, based on best available practices currently accepted by USFWS/CDFW, will be used to reduce risk of predation or mortality resulting from disoriented animals fleeing the release site. **MM 4.4-10** The project proponent will utilize the measures below to avoid and minimize impacts on San Joaquin Antelope Squirrels (SJAS) during Project activities. CDFW will be notified if the avoidance and minimization measures, including SJAS trapping and relocation, vary from what is described below. a. No more than 14 days prior to construction, a qualified biologist will conduct surveys to identify all potential burrows used by SJAS within the disturbance areas and within 50 feet of areas where ground disturbance will occur. b. A qualified biologist will establish a buffer of at least 50 feet around potential SJAS burrows to avoid impacts on burrows. The buffer area will be delineated prior to construction activities and marked with		

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		brightly colored markers that will be visible to workers as well as signs, stakes, flags, and/or rope or cord. c. Any potential SJAS burrows detected by the qualified biologist within the temporary exclusion fencing installed after preconstruction surveys that cannot be avoided will be live trapped prior to surface disturbance or vegetation grubbing activities within that specific temporary exclusion fencing area and relocated. Live-trapping and relocation procedures will adhere to a relocation plan for SJAS approved by CDFW prior to ground disturbance occurring. The qualified biologist will conduct live trapping over at least five consecutive days. If possible, trapping and the relocation of SJAS will avoid the breeding/mating season (January to May) in order to avoid disrupting family units. Ideally, this will take place during late summer and early fall. d. After completion of live trapping, burrows would be fully excavated by hand. Any SJAS encountered during the excavation will be allowed to escape to adjacent natural habitat (if present) or, at the discretion of the qualified biologist, collected and relocated. e. Trapped or collected SJASs would be relocated to an area of suitable habitat in the project area, at least 50 feet from any disturbance areas. The qualified biologist will conduct reconnaissance surveys of a potential release site to determine suitability. f. Only the qualified biologist is authorized to capture, handle, and relocate SJAS. **MM 4.4-11** Any potential San Joaquin kit fox dens (SJKF) (as defined in USFWS2011) detected during reconnaissance or focused/protocol surveys shall be reevaluated by the qualified biologist for species activity no more than 30 days prior to the commencement of ground disturbance in the required preconstruction survey. Potential kit fox dens shall be marked, and a 50-foot avoidance buffer shall be delineated using brightly colored stakes and flagging or similar materials to prevent inadvertent damage to the potential den. If the qualified biologist determines that an unoccupied potential den cannot be avoided, the den may be hand excavated in accordance with the USFWS Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance (USFWS 2011). If species activity is detected, the location shall be identified as a "known" kit fox den in accordance with the U.S. Fish and Wildlife Service species guidelines (USFWS 2011). A minimum 100-foot buffer from any disturbance area shall be maintained for known dens and a minimum 500-foot buffer from any disturbance area shall be maintained for natal dens. No excavation of a known or natal den shall occur without prior authorization from the USFWS and the CDFW. For activities occurring on land covered under an approved federal and/or State incidental take authorization, the requirements set forth in those documents shall be implemented. Other standard measures to protect San Joaquin kit fox, including capping pipes, covering trenches, adding exit ramps to excavated areas, shall be implemented in accordance with MM 4.4-15. **MM 4.4-12** Occupied American badger dens detected during pre-disturbance surveys shall be flagged and ground-disturbing activities avoided within 50 feet of the den. Maternity dens shall be avoided and a minimum 200-foot buffer from disturbance shall be maintained during pup-rearing season (February 15 through July 1). Maternity dens must be avoided to the maximum extent feasible in the opinion of the qualified biologist. If an active maternity den is proposed to be disturbed, the qualified biologist, shall consult with the CDFW to identify any appropriate additional minimization measures which the qualified biologist determines, with the wildlife agencies, can actually be implemented based on field conditions. All such measures must be implemented for project activities. **MM 4.4-13** The following measures will be implemented to avoid take of Swainson's Hawks and to ensure protection of these animals during project activities:		

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Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		a. At least one year prior to construction, a qualified biologist shall conduct a protocol survey within the project footprint and a 0.5 mile buffer zone following the Swainson's Hawk Advisory Committee *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Advisory Committee 2000). The Swainson's hawk protocol survey effort shall include: Phase I: Pre-breeding Season Nest Surveys (recommended optional); Schedule: one all day survey conducted from January to March; Phase II: Nesting Territory and Courtship Surveys; Schedule: three surveys conducted from sunrise to 10:00AM and/or 16:00PM to sunset; surveys conducted from March 20 to April 5; Phase III: Nesting Activity Surveys; Schedule: three surveys conducted from sunrise to noon and/or 16:30PM to sunset; surveys conducted from April 5 to April 20; Phase IV: Egg-laying and Incubation Monitoring (monitoring known nest sites only, if required); Schedule: monitoring conducted as needed per biologist discretion from April 21 to June 10; Phase V: Fledging and Post-fledging Monitoring (if required); Schedule: three monitoring days conducted from sunrise to noon and/or 16:00PM to sunset; monitoring conducted from June 10 to July 30. b. If active Swainson's hawk nest(s) are identified during protocol surveys, Aera Energy shall coordinate with CDFW to develop appropriate avoidance buffers and to determine if a State ITP for Swainson's hawk is required. c. At minimum, a 500-foot avoidance buffer shall be maintained surrounding active Swainson's hawk nests unless CDFW agrees to a reduced buffer. **MM 4.4-14** Pre-disturbance surveys for active bird nests must be conducted no more than 10 days prior to the commencement of disturbance. Surveys shall follow United States Fish and Wildlife and CDFW guidance and/or protocols, as applicable. If no active nests or nesting birds are identified, then project construction activities may proceed and no further mitigation measures for nesting birds are required. If active nest(s) are identified, the active nest(s) should be continuously surveyed for the first 24 hours after detection, to establish a behavioral baseline prior to any construction-related activities. Once construction commences, all nests shall be continuously monitored to detect any behavioral changes as a result of the project (i.e., nest avoidance or abandonment). If behavioral changes are observed, the work causing that change shall cease until the owner/operator qualified biologist consults with the CDFW and the United States Fish and Wildlife and the qualified biologist used by the owner/operator implements the recommended measures. During such times as the qualified biological monitor is not on site while construction workers are on site, a minimum non-disturbance buffer of 250 feet shall be established around active nests and a 500-foot no-disturbance buffer around the nests of raptors until the breeding season has ended, or until a qualified biologist has determined that the birds have fledged and are no longer reliant upon the nest or parental care for survival, and any adult birds are no longer occupying the nest. Deviations from these no disturbance buffers may be implemented if the qualified biologist concludes that work within the buffer area would not cause nest avoidance or abandonment (e.g., when the disturbance area would be concealed from a nest site by		

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Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		topography) provided that notification of this determination of a deviation in the no-disturbance buffer is provided by the qualified biologist no less than 15 days in advance to the CDFW and the United States Fish and Wildlife. **MM 4.4-15** The following measures will be implemented to avoid take of blunt-nosed leopard lizard and to ensure protection of these animals during project activities: a. Project activities will avoid all potential burrows that may be occupied by blunt-nosed leopard lizards. Suitable burrows within and adjacent to potential habitat for the species should be avoided by a minimum distance of 50-feet in all areas where ground-disturbing project activities will occur. b. No more than one year prior to ground-disturbing activities, focused surveys following current CDFW and United States Fish and Wildlife protocols for detection of this species, or other methods approved by both agencies shall be conducted in all potential blunt-nosed leopard lizard habitat within the work site and a 250-foot buffer area. If no individual blunt-nosed leopard lizards are observed during focused surveys, and surveys are current (e.g., completed in the same calendar year), then project activities may proceed. c. If blunt-nosed leopard lizards are detected during focused surveys, a blunt-nosed leopard lizard avoidance plan shall be prepared for the project that will result in avoidance of incidental take of this species unless take is separately authorized under a Natural Communities Conservation Plan and appropriate federal authorization is obtained. At a minimum, the blunt-nosed leopard lizard avoidance plan shall be provided to the CDFW and the County, and shall contain the following elements: 1. A Worker Environmental Awareness Program shall be implemented for all construction personnel before construction begins. 2. During periods that are optimal for blunt-nosed leopard lizard activity (early spring through late fall), a qualified biologist will be present during all ground-disturbing activities. The qualified biologist will check the project site(s) and access route(s) daily during the blunt-nosed leopard lizard active season to determine presence or absence of lizards in or near the work areas. Monitoring by a qualified biologist is not required during periods of inactivity (the winter season). 3. All open trenches or excavations shall be covered at the end of each workday or protected with the use of exclusion fencing to prevent wildlife entrapment. If an excavation is too large to cover, escape ramps shall be installed at an incline ratio of no greater than 2:1. All trenches and pipes shall be inspected for the presence of wildlife each day prior to the commencement of work. If blunt-nosed leopard lizards are observed at the work site during construction, construction shall cease within a 250-foot radius and the USFWS, and the CDFW shall be consulted to determine what additional measures would be necessary to prevent take of this species. 4. Off-site locations where blunt-nosed leopard lizards have been observed or are likely to occur shall be clearly marked to prevent workers from driving off the road and to prevent inadvertent destruction of burrows. Barriers, such as exclusionary fencing may be installed. All construction equipment and construction personnel vehicles will be checked prior to moving to ensure no blunt-nosed leopard lizard are under equipment/vehicles. 5. A speed limit of 10 miles per hour shall be posted and observed within 0.25 miles of any reported blunt-nosed leopard lizard observation.		

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6. Construction activities shall avoid burrows that may be used by blunt-nosed leopard lizards. Any location of proposed construction activity with potential to collapse or block burrows (i.e., stockpile storage, parking areas, staging areas, trenches) will be identified prior to construction in the blunt-nosed leopard lizard avoidance plan and approved by the qualified biologist. The qualified biologist may allow certain activities in burrow areas if the combination of soil hardness and activity impact is not expected to collapse burrows and no blunt-nosed leopard lizards have been found during pre-project surveys in the impact area.
7. All individual blunt-nosed leopard lizards observed above-ground will be avoided. Any individual blunt-nosed leopard lizard that may enter the project site(s) would be allowed to leave unobstructed, and on its own accord. If a blunt-nosed leopard lizard is detected during biological monitoring or observed at any other point, the CDFW and the USFWS shall be notified to determine what additional measures would be necessary to prevent take of the species.
8. If blunt-nosed leopard lizards are observed within the exclusionary fencing during construction, a 250-foot avoidance buffer will be erected on the north and south side of the buffer while the eastern and/or western edges of the fencing will be dis-assembled and lain on the ground to allow the blunt-nosed leopard lizard to leave on its own volition. Once the blunt-nosed leopard lizard is observed leaving the work area the fencing will be installed back to its previous condition and the 250-foot buffer removed. If the blunt-nosed leopard lizard does not leave the work area of its own volition within 24 hours, USFWS/CDFW will be consulted for further guidance.

MM 4.4-16 The owner/operator shall comply with the following for any and all grading and construction activities on all project components, including all injection wells, abandonment of wells, capture facilities and pipelines.

a. Prior to ground disturbance plant surveys for Protected Species and Sensitive Species must be completed by a qualified biologist during the appropriate blooming periods for species identification and detection (as shown in Table 4.4-10). Plant surveys shall be conducted in accordance with all applicable protocols established by the USFWS and the CDFW for particular plant species (Plant Survey Protocol) and shall extend 50 feet from areas where any new disturbance would occur unless a greater survey distance is specified in the Plant Survey Protocol.

Table 4.4-3: Blooming Period of Special-Status Plants with Potential to Occur

Special-Status Plant Species	Optimal Blooming Period
Heart scale *(Atriplex cordulata* var. *cordulata)*	April – October
Lost Hills crownscale *(Atriplex coronata S. Watson var. vallicola)*	April – September
California jewelflower *(Caulanthus californicus)*	February – May
Recurved larkspur *(Delphinium recurvatum)*	March – June

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Kern mallow *(Eremalche kernensis)*	January/February/March – May
Tejon poppy *(Eschscholzia lemmonii* ssp. *kernensis)*	February/March – May
Showy golden madia *(Madia radiata)*	March – May
San Joaquin woollythreds (*Monolopia congdonii*)	February – May
Forked Fiddleneck (*Amsinckia furcata)*	February – May
Coronata (*Atriplex coronata var. coronata)*	March – October
Carrizo Plain Corwnscale *(Atriplex flavida)*	March – July
Lemon's jewelflower *(Caulanthus lemmonii)*	February – May
Hoover's eriastrum (*Eriastrum hooveri*)	February/March – July
Cottony buckwheat (*Eriogonum gossypinum)*	March – September
Diamond-petaled California poppy (*Eschscholzia rhombipetala)*	March – April
Pale-yellow layia (*Layia heterotricha)*	March – June
California alkali grass (*Puccinellia simplex)*	March – May
San Joaquin bluecurls (*Trichostema ovatum)*	April/June/July – October
King's gold (*Tropidocarpum californicum)*	February – March

All detected plant populations of Protected Species and Sensitive Species shall be identified in the field during the surveys with temporary flags or other visible materials to avoid and minimize impacts to the plant populations from any disturbance activities.

b. No incidental take or relocation of any plant listed under the federal Endangered Species Act, the California Endangered Species Act, or the California Native Plant Protection Act may occur unless the incidental take is authorized by the USFWS and/or the CDFW in a permit or other authorization, or in an approved Habitat Conservation Plan or Natural Communities Conservation Plan. If focused plan surveys detect the presence of any listed plant, the plant populations shall be buffered from disturbance activities by implementing applicable impact

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		avoidance protocols established by the USFWS and/or the CDFW unless incidental take authority is obtained. Projects covered under incidental take authority shall conduct activities in accordance with the take authorization. The qualified biologist may consult with the CDFW to determine the recommended buffer distances required to prevent incidental take of a listed plant if avoidance protocols have not been established for the species. The qualified biologist shall confirm that all applicable listed plant buffers have been implemented prior to the commencement of any disturbance activity. All compensation for habitat loss shall be as determined through consultation with the wildlife agencies. c. Sensitive species plant populations which are not Protected Species that may be impacted by new ground-disturbing activities must be avoided by a 50-foot buffer, as delineated and implemented by a qualified biologist used by the owner/operator. **MM 4.4-17** A Worker Environmental Awareness Program shall be developed and implemented for all personnel that could access the site prior to commencing any disturbance activities. The program shall consist of an on-site or center presentation that will describe the locations and types of sensitive plant, wildlife, and sensitive natural communities (collectively, "Biological Resources") on and near the site, an overview of the laws and regulations governing the protection of Biological Resources, the reasons for protecting the Biological Resources, the specific protection and avoidance measures that are applicable to the site, and the identity of designated points of contact should questions or issues arise, including the qualified biologist. The program shall provide training to recognize, avoid and report to applicable qualified biologists any Biological Resources on the site. a. The Worker Environmental Awareness Program shall emphasize the need to avoid contact with on-site wildlife and avoid entry into areas where Biological Resources have been identified based on pre-disturbance field surveys and to implement the buffer avoidance or other protection measures established by the USFWS shall be identified CDFW or required by the Biological Resource mitigation measures. The training shall emphasize the importance of not feeding or domesticating wildlife and the need to avoid any trash, micro trash, or potential food disposal on site except in animal-proof containers emptied daily to avoid attracting or causing adverse impacts to special status wildlife. b. All on-site personnel must sign a statement verifying that they have completed the Worker Environmental Awareness Program, and that they understand and agree to implement the biological requirements for the worksite. If signed employee statements are not available, documentation may be provided by Worker Environmental Awareness Program training records, which shall be kept by the owner/operator for a minimum of 5 years. Each owner/operator shall maintain a list of all persons who have completed the training program and shall provide the list to the County or to State and federal wildlife agency representatives upon request. **MM 4.4-18** After construction, but before operation of any Class VI Injection well for the CCS project, a 500-foot wildlife protection buffer setback from the edge of the well pad shall be established and fenced to prevent wildlife from accessing the site. The qualified biologist shall conduct full clearance surveys before any fencing installation and monitor the installation. Reasonable measures shall be used by the owner/operator when servicing the well		

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		to control the site to ensure that gates are not left open such that wildlife are permitted to enter. The qualified biologist shall create a protocol for the workers to implement to review the site before closing the gate to ensure not wildlife are trapped inside and for allowing for the escape of any wildlife that does inadvertently enter the fenced buffer area. Any wildlife found that might have been affected by exposure to CO_2 shall immediately cause a shutdown of all injection operations, compliance with all requirements of the EPA Class VI UIC permit and on-site consultant with California Fish and Game and USFWS. **MM 4.4-19** The following additional measures shall be implemented to avoid and minimize potential significant adverse impacts to Protected and Sensitive Species: a. All vehicles shall observe a 20-mile-per-hour speed limit in all areas of disturbance and on unpaved roads unless otherwise posted. Off-road traffic outside of designated access routes is prohibited. Speed limit signs shall be posted in visible locations at the point of site entry and at regular intervals on all unpaved access roads. b. All disturbance activities, except emergency situations or drilling that may require continuous operations, shall only occur during daylight hours. Nighttime disturbance activity for drilling purposes shall use directed lighting, shielding methods, and comply with applicable lighting mitigation measures. c. The project will limit nighttime activity to essential personnel only, including emergency response or security personnel, to ensure that vehicle traffic necessary during nighttime hours will minimize effects on Giant Kangaroo Rat and San Joaquin Antilope Squirrel. c. The project will initiate a trash abatement program before starting project activities and will continue the program for the duration of the project. All food-related trash items and all forms of micro trash, such as wrappers, cans, bottles, bottle tops, and food scraps shall be disposed of in closed, animal-proof containers and removed daily from the site. d. The project will minimize new disturbance and habitat fragmentation by consolidating infrastructure and confining all project-related parking, storage, laydown, and temporary equipment storage areas to previously disturbed areas to the greatest extent practicable. d. Excavations, spoils piles, access roadways, and parking and staging areas shall subject to dust control as set forth in the dust control mitigation measures. e. The use of herbicides for vegetation control shall be restricted to those approved by the USFWS and the CDFW. No rodenticides shall be used on any site unless approved by the USFWS, and the CDFW, and shall observe label and other restrictions mandated by the United States Environmental Protection Agency, California Department of Food and Agriculture, and State and federal laws and regulations. For split estates, no herbicides for vegetation control may occur in Tier 2 areas without surface owner approval. f. No plants or wildlife shall be collected, taken, or removed from the site or any adjacent locations except as necessary for project-related vegetation removal or wildlife relocation by a qualified biologist and subject to all applicable permits and authorizations.		

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Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		g. All open trenches or excavations shall be covered at the end of each workday to prevent wildlife entrapment. The agency-approved biologist will inspect all such materials for special-status wildlife before they are moved, buried or capped. If an excavation is too large to cover, escape ramps shall be installed at an incline ratio of no greater than 2:1. All trenches and pipes shall be inspected for the presence of wildlife each day prior to the commencement of work. h. To enable San Joaquin kit foxes and other wildlife to pass through the project site, any perimeter fencing shall include a 4- to 8-inch opening between the fence mesh and the ground, or the fence shall be raised 4 inches above the ground except blunt-nosed leopard lizard exclusion fencing. The bottom of the fence fabric shall be knuckled (wrapped back to form a smooth edge) to protect wildlife. i. All vertical tubes used in project construction and chain link fencing poles, shall be temporarily or permanently capped to avoid the entrapment and death of special-status wildlife and birds. All pipes 1.5 inches or greater in diameter stored overnight on a project location must have end caps or other physical barriers that prevent wildlife from entering the pipe. j. All dead or injured special status wildlife shall be left in place and reported to the USFWS and the CDFW within 48 hours of discovery for rescue or salvage. Discovery of State or federal listed species that are injured, or dead shall also be managed consistent with regulatory requirements, including being reported immediately via telephone and within 24 hours in writing, and with a copy to Kern County Planning and Natural Resources. k. All drilling installations and operations will comply at all times with the applicable federal, State, County, and local law ordinances and regulations. 1. During preconstruction surveys, the qualified biologist shall delineate previously disturbed areas to be used by the owner/operator to minimize the amount of new disturbance. m. All concrete and asphalt debris should be removed from the site for recycling or disposal at an authorized, permitted facility. n. No vehicles or construction equipment shall be parked within a wetland or waterbody/dry wash. o. No vehicles shall park within 50 feet of known special-status species dens, burrows, or precincts. o. To the greatest extent feasible, vehicles left overnight will not be located within 50 feet of small mammal burrows. o. Tracked vehicles and other construction equipment must be washed or maintained to be weed-free prior to entering and working within areas of new disturbance. p. All washing of trucks, paint, equipment, or similar activities should occur in areas where runoff is fully contained for collection and off-site disposal. Wash water may not be discharged from the site and shall be located at least 100 feet from any water body, or sensitive Biological Resources.		

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Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		q. Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland boundaries or waterbody, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land. r. In the event that oil, produced water, or drilling mud containing oil are accidentally conveyed to an excavated area, the project proponent will implement measures to preclude Blunt Nose Leopard Lizard, Giant Kangaroo Rat, and San Joaquin Kit Fox access to the excavated area until oil and oil residues have been removed and no longer pose exposure risk to wildlife. Measures will include installation of temporary netting or covering to preclude species access. r. All areas that must be avoided as result of the pre-disturbance surveys, and areas where new disturbance will occur, shall be clearly delineated by fencing or staking and flagging and/or rope or cord. s. No firearms shall be allowed on any site. t. No pets shall be allowed on any site. u. No smoking may occur except in designated areas. **MM 4.4-20** Post-construction, the applicant shall restore temporarily impacted Allscale Shrubland and Red Brome or Mediterranean Grass Grasslands. A qualified habitat restoration specialist shall prepare a Habitat Mitigation and Monitoring Plan that outlines the following at minimum: a. Mitigation work plan, including species palette, planting and irrigation schedule, hydroseeding, and erosion control; b. Maintenance plan/schedule; c. Success criteria; d. Monitoring methods; e. Monitoring and reporting schedule; and f. Provisions for long-term and adaptive management. **MM 4.4-21:** For permanent impacts to Allscale Scrubland and Red Brome or Mediterranean Grass Grasslands habitat, the Applicant shall either: a. Purchase conservation bank credits at a minimum 2:1 replacement ratio; or b. Obtain suitable mitigation lands to preserve Allscale Scrub shrubland habitat at a minimum 2:1 replacement ratio:		

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		a. All land that is protected for the purpose of mitigation will be placed under a permanent conservation easement and managed in perpetuity; b. Mitigation lands shall be monitored, with a monitoring and reporting schedule to be negotiated with the involved regulatory agencies (e.g., CDFW).		
Impact 4.4-2 Have a Substantial Adverse Effect on Any Riparian Habitat or Other Sensitive Natural Community Identified in Local or Regional Plans, Policies, Regulations, or by the California Department of Fish and Wildlife or the United States Fish and Wildlife Service	No Impact	No mitigation measures are required.	No Impact	Significant and unavoidable
Impact 4.4-3 Have a Substantial Adverse Effect on Federally Protected Wetlands as Defined by Section 404 of the Clean Water Act (Including, but Not Limited to, Marsh, Vernal Pool, Coastal, etc.) through Direct Removal, Filling, Hydrological Interruption, or Other Means	Potentially significant	**MM 4.4-22** Pre-disturbance surveys shall be conducted by a qualified biologist during the appropriate periods for detecting Sensitive Natural Communities that could occur within the project area. The surveys shall be completed consistent with applicable protocols approved by the USFWS and/or the CDFW, including the Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFW 2009). The qualified person shall map and identify all sensitive natural communities, including riparian communities that occur in or within 100 feet of any new disturbance area. The site plan for the proposed activity shall identify waters, wetlands, resources subject to Section 1600 of the CFGC, and other riparian habitats that occur in and within 100 feet of the disturbance area. **MM 4.4-23** No land disturbance activity in any Sensitive Natural Community that requires a State or federal permit, including State or federally regulated wetlands and waters, shall occur unless the activity is specifically authorized by the issuance of permits or approvals as required by State and federal law. This provision is not intended to restrict survey activities or restrict permit approvals for such disturbance activities. However, no new wells, tanks, sumps or ponds shall be constructed within 50 feet of federal or State waters or wetlands.	Less than significant	Significant and unavoidable
Impact 4.4-4 Interfere Substantially with the Movement of any Native Resident or Migratory Fish or Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites	Potentially significant	Implement **MM 4.4-1**, **MM 4.4-3**, **MM 4.4-14**, **MM 4.4-17**, and **MM 4.4-19**	Less than significant	Significant and unavoidable
Impact 4.4-5 Conflict with Any Local Policies or Ordinances Protecting Biological Resources, Such as a Tree Preservation Policy or Ordinance	No impact	No mitigation measures are required.	No impact	No impact
Impact 4.4-6 Conflict with the Provisions of an Adopted Habitat Conservation Plan, Natural Community Conservation Plan, or Other Approved Local, Regional, or State Habitat Conservation Plan	Potentially significant	No mitigation measures are required.	Less than significant	Significant and unavoidable

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
Impact 4.4-7 Cumulative Impact to Biological Resources	Potentially significant	Implement **MM 4.4-1** through **MM 4.4-23**, as described above.	Significant and unavoidable	Significant and unavoidable
• **Cultural Resources**	•	•	•	•
Impact 4.5-1 Cause a Substantial Adverse Change in the Significance of a Historical Resource as Defined in Section 15064.5	Potentially significant	**MM 4.5-1** The following are requirements for any and all grading and construction activities on all project components with defined ground disturbance, including all injection wells, abandonment of wells, capture facilities and pipelines. The remaining carbon capture and storage (CCS) Surface Land Area that is within the project boundary but has no construction or disturbance is not subject to this requirement. a. The owner/operator shall demonstrate whether the project site has been previously surveyed for cultural resources. The owner/operator may rely on a previously performed ground surface survey for subsequent ground disturbing activities. If the project site has not been previously surveyed based on the records search information, an intensive (100%) pedestrian ground surface survey (Phase I survey/Class III inventory) by qualified archaeologists shall be required. If no cultural resources have been recorded, then no further cultural resources studies shall be required. b. All prehistoric/Native American archaeological sites, whether identified during the records searches or during the intensive survey, shall be demarcated by a qualified archaeologist, fenced by the owner/operator, and preserved in place. c. Should it be determined that preservation in place is not achievable, then historical (Euro-American) archaeological sites that are potentially eligible for listing in the National Register of Historic Places and/or California Register of Historical Resources shall be evaluated by a qualified archaeologist or historian and must meet the requirements of the National Historic Preservation Act of 1966 and/or California Public Resources Code (PRC) 5024.1; 14 CCR Section 15064.5[a][3] in order to qualify. Qualifying sites, structures and equipment that are identified during the records search or field survey shall be fenced and preserved in open space, removed and curated, or treated using data recovery procedures that follow the guidelines of the Secretary of the Interiors Standards for Architectural and Engineering Documentation. d. Historical (Euro-American) archaeological site types relating to oil and gas activities that have been determined Not Significant/Unique shall require no archaeological study or treatment. e. All employees conducting work in the area identified on the CCS final design plans shall complete Worker Environmental Awareness Program training including training dedicated to cultural resources protection. f. Qualified Native American Tribal monitors shall be retained from a Kern County Federally recognized tribe for all construction activities. The Tribe may elect to delegate this employment to other Tribes in the area. All monitors must have completed safety training for oilfield worker as well as the Worker Environmental Awareness Program. Written documentation from the Tribe on the monitors and completed training shall be provided to the Kern County Planning and Natural Resources Department.	Less than significant	Significant and unavoidable
Impact 4.5-2 Cause a Substantial Adverse Change in the Significance of an Archaeological Resource as Defined in Section 15064.5	Potentially significant	**In addition to MM 4.5-1 previously identified, MM 4.5-2 would be incorporated.**	Less than significant	Significant and unavoidable

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		MM 4.5-2 In the event archaeological materials are encountered during the course of ground disturbance or construction, the project operator/contractor shall cease any ground disturbing activities within 500 feet of the find or as needed to preserve the site. The qualified archaeologist shall evaluate the significance of the resources and recommend treatment measures. Per California Environmental Quality Act (CEQA) Guidelines Section 15126.4(b)(3), project redesign and preservation in place shall be the preferred means to avoid impacts to significant historical resources. Consistent with CEQA Guidelines Section 15126.4(b)(3)(C), if it is demonstrated that resources cannot be avoided, the qualified archaeologist shall develop additional treatment measures in consultation with the County, which may include data recover or other measures. The Planning and Natural Resources Department shall consult with Native American representatives in determining treatment for unearthed cultural resources if the resources are prehistoric or Native American in nature. If after consultation it is determined that archaeological materials are to be recovered, then they shall be curated at an accredited curation facility. The qualified archaeologist shall prepare a report documenting evaluation and/or additional treatment of the resource. A copy of the report shall be provided to the Kern County Planning and Natural Resources Department and to the southern SJV Information Center.		
Impact 4.5-3 Disturb any Human Remains, including those Interred outside of Formal Cemeteries	Potentially significant	**MM 4.5-3** If human remains are uncovered during project construction, the owner/operator shall immediately halt all work on the site, contact the Kern County Coroner to evaluate the remains, and follow the procedures and protocols set forth in Section 15064.5 (e)(1) of the CEQA Guidelines. The Kern County Planning and Natural Resources Department shall be notified concurrently. If the County Coroner determines that the remains are Native American, the project proponent shall contact the NAHC, in accordance with Health and Safety Code Section 7050.5, subdivision (c), and Public Resources Code 5097.98 (as amended by Assembly Bill 2641). The NAHC shall designate a Most Likely Descendant for the remains per Public Resources Code 5097.98. Per Public Resources Code 5097.98, the owner/operator, in coordination with the landowner, shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located, is not damaged or disturbed by further development activity until the discussion and conference with the Most Likely Descendant has occurred, if applicable, taking into account the possibility of multiple human remains. If the remains are determined to be neither of forensic value to the Coroner, nor of Native American origin, provisions of the California Health and Safety Code (7100 et. seq.) directing identification of the next-of-kin will apply. In the event human remains are uncovered, the surface owner shall be notified immediately.	Less than significant	Significant and unavoidable
Impact 4.5-4 Contribute to Cumulative Cultural Resources Impacts	Potentially significant	Implement **MM 4.5-1** through **MM 4.5-3**.	Significant and unavoidable	Significant and unavoidable
Energy				
Impact 4.6-1 Project would result in potentially significant environmental impact due to wasteful, inefficient or unnecessary consumption of energy resources during project construction or operation	• ess than significant	No mitigation measures are required.	• ess than significant	• ignificant and unavoidable
Impact 4.6-2 The project would conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	• ess than significant	• No mitigation measures are required.	• ess than significant	• ess than significant

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
•				
• **Impact 4.6-3** • Cumulative Energy Impacts Contribute to	• otentially significant	**MM 4.6-1** The operator shall provide an annual report on the total amount of electricity consumed by the carbon capture facilities associated with sources that send CO2 for injection into the project storage site. The report shall detail the facility the source of the power and the annual amount. The report shall include a discussion of modifications that are being considered by each source to reduce electricity use. The first report is due the 13th month after the first month injection commences. The report shall be provided to the Kern County Planning and Natural Resources Agency, U.S. Environmental Protection Agency Underground Injection Control Permit Division, California Air Resources Board, California Public Utilities Commission, California Energy Commission, and California Independent System Operators.	• ignificant and unavoidable	• ignificant and unavoidable
• **Geology and Soils**	•	•	•	•
Impact 4.7-1 Directly or Indirectly Cause Substantial Adverse Effects, Including the Risk of Loss, Injury, or Death Involving the Rupture of a Known Earthquake Fault, as delineated on the most recent Alquist-Priolo earthquake fault zoning map issued by the state geologist for the area based on other substantial evidence of a known fault	Potentially significant	**MM 4.7-1** The owner/operator shall prepare a comprehensive seismic activity monitoring plan that includes connection to the Statewide seismic monitoring program California Integrated Seismic Network (CISN) The draft plan shall be submitted concurrently to all the following agencies: U.S. Environmental Protection Agency, Region 9, CISN, California Air Resources Board (CARB), Kern County Public Works and Kern County Planning and Natural Resources. The final plan shall be approved by CARB and include all requirements of State law including but not limited to: appropriate subsurface monitoring to ensure geologic sequestration of injected carbon dioxide; identification of hazards and conditions that may require the suspension of carbon dioxide injections; notification protocols for all applicable agencies and emergency procedures. All requirements for seismic monitoring adopted by CARB – "Carbon Capture, Removal, Utilization and Storage Program" shall be implemented.	Less than significant	Significant and unavoidable
Impact 4.7-2 Directly or Indirectly Cause Substantial Adverse Effects, Including the Risk of Loss, Injury, or Death Involving Strong Seismic Ground Shaking	Potentially significant	Implement **MM 4.7-1.**	Less than significant	Significant and unavoidable
Impact 4.7-3 Directly or Indirectly Cause to Substantial Adverse Effects, Including the Risk of Loss, Injury, or Death Involving Seismic-Related Ground Failure, Including Liquefaction	Potentially significant	Implement **MM 4.7-1.**	Less than significant	Significant and unavoidable
Impact 4.7-4 Directly or Indirectly Cause Substantial Adverse Effects, Including the Risk of Loss, Injury, or Death Involving Landslides	Potentially significant	**MM 4.7-2** Operators shall not site wells or accessory equipment and facilities on slopes greater than 30%.	Less than significant	Less than significant
Impact 4.7-5 Result in Substantial Soil Erosion or the Loss of Topsoil	Potentially significant	Implement stormwater mitigation measures, as described in Section 4.10, Hydrology and Water Quality.	Less than significant	Less than significant
Impact 4.7-6 Be Located on a Geologic Unit or Soil That is Unstable, or That Would Become Unstable as a Result of the Project, and Potentially	Potentially significant	**MM 4.7-3** The owner/operator shall implement all requirements of a site-specific geotechnical report.	Less than significant	Less than significant

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
Result in On- or Off-site Landslide, Lateral Spreading, Subsidence, Liquefaction, or Collapse				
Impact 4.7-7 Be Located on Expansive Soil, as Defined in Table 18-1-B of the Uniform Building Code (1994), Creating Substantial Risks to Life or Property	Potentially significant	**MM 4.7-4** The owner/operators shall avoid building infrastructure on expansive soil, unless the owner/operator determines that CCS injection facilities are infeasible from a different location, and site-specific Professional Engineering certification is submitted concluding that the new equipment will not cause substantial risks to life or property. The site-specific professional engineering certification must be submitted and reviewed by the Kern County Public Works Department and a memo provided that agrees that construction and operation of new equipment will not cause substantial risks to life or property as determined through established engineering standards. All recommendations required by the approved engineering certification from Kern County Public Works shall be implemented.	Less than significant	Less than significant
Impact 4.7-8 Have Soils Incapable of Adequately Supporting the Use of Septic Tanks or Alternative Wastewater Disposal Systems Where Sewers Are Not Available for the Disposal of Wastewater	No impact	Implement **MM 4.7-3**.	Less than significant	Less than significant
Impact 4.7-9 Directly or Indirectly Destroy a Unique Paleontological Resource or Site or Unique Geologic Feature, as defined in CEQA Guidelines Section 15064	Potentially significant	**MM 4.7-5** As part of any Worker Environmental Awareness Program training, all construction personnel shall be trained regarding the recognition of possible uncovered paleontological resources and protection of paleontological resources during construction, prior to the initiation of construction or ground-disturbing activities. Training shall inform construction personnel of the procedures to be followed upon the discovery of paleontological materials. All personnel shall be instructed that unauthorized collection or disturbance of fossils is unlawful. **MM 4.7-6** Prior to commencement of any work on project wells, capture facilities or facility pipeline a mitigation fee of $10,000 shall be paid to the Buena Vista Museum to fund the continued education and curation of paleontological resources and provide educational support regarding the paleontological history of the region.	Less than significant	Less than significant
Impact 4.7-10 Contribute to Cumulative Geologic and Soils Impacts	Potentially significant	Implement **MM 4.7-1** through **MM 4.7-6.**	Significant and unavoidable	Significant and unavoidable
• **Greenhouse Gas Emissions**	•	•	•	•
Impact 4.8-1 Generate Greenhouse Gas Emissions, Either Directly Or Indirectly, that may have a Significant Impact on the Environment	Potentially significant	**MM 4.8-1** Prior to any injection of CO_2 the owner/operator shall submit a monitoring plan that complies with all requirements of the U.S. Environmental Protection Agency (EPA) Underground Injection Control permit issued for the project to demonstrate the retention of CO_2 in the injection/hydrocarbon reservoir zone. The plan shall be submitted to the Kern County Planning and Natural Resources Department concurrent with submittal to the EPA for review. A copy of the final approved plan from the EPA shall be provided to the Kern County Planning and Natural Resources Department. **MM 4.8-2** The owner/operator shall submit to the Kern County Planning and Natural Resources Department a quarterly report on the amount of CO_2 injected into the carbon capture and storage (CCS) project, and the source of the CO_2. The reports shall be filed no later than the following dates of each year: a. First quarter – March 31 b. Second Quarter – June 30	Significant and unavoidable	Significant and unavoidable

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		c. Third Quarter – September 30 d. Fourth Quarter – December 18 (early deadline) **MM 4.8-3** All new permitted stationary sources associated with the CCS project shall comply with the Cap-and-Trade regulation (e.g., by reducing greenhouse gas emissions within their facilities or by surrendering greenhouse gas allowances, offset credits, or other compliance instruments to offset the greenhouse gas increases), and implement Best Performance Standards applicable to greenhouse gas reduction for Components at Light Crude Oil and Natural Gas Production, Natural Gas Processing Facilities. **MM 4.8-4** The CCS project shall implement methods to recover for reuse or destroy methane existing in associated gas and casinghead gas, as follows: a. Recover all associated gas produced from the reservoir via new wells, regardless of the well type, except for gas produced from wildcat and delineation wells or as a result of start-up, shutdown and maintenance activities (whether planned or unplanned), system failures, and emergencies in accordance with San Joaquin Valley Air Pollution Control District (SJVAPCD) regulations (Rule 4401 and 4409), as this may be amended over time. **MM 4.8-5** The CCS project shall implement any regulations adopted or amended for methane. **MM 4.8-6** The project shall offset all greenhouse gas emissions associated with the capture facility, and construction equipment not covered by the Cap and-Trade program or other mandatory greenhouse gas emission reduction measures through owner/operator reductions of greenhouse gas emissions as verified by the SJVAPCD, through acquisition of offset credits from the California Air Pollution Control Officers Association Exchange Register or other third party greenhouse gas reductions as verified by the SJVAPCD, or through inclusion in an Emission Reduction Agreement, to offset project-related greenhouse gas emissions that are not included in the Cap-and-Trade program to assure that no net increase in greenhouse gas emissions from the project construction or operation occur. All sources providing CO_2 for injection must certify that any additional CO_2 generated from the source capture facility has been mitigated to "no net increase" before injection at the Aera CarbonFrontier Project (Kern County).		
Impact 4.8-2 Conflict with any Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing the Emissions of Greenhouse Gases	Potentially significant	Implement **MM 4.8-1** and **MM 4.8-2.**	Significant and unavoidable	Significant and unavoidable
Impact 4.8-3 Cumulative Greenhouse Gas Emissions Impacts	Potentially significant	Implement **MM 4.8-1** through **MM 4.8-6**	Significant and unavoidable	Significant and unavoidable
• **Hazards and Hazardous Materials**	•	•	•	•
Impact 4.9-1 Create a Significant Hazard to the Public or the Environment through the Routine Transport, Use, or Disposal of Hazardous Materials	Potentially significant	**MM 4.9-1** The owner/operator shall provide a comprehensive Worker Environmental Awareness Program to Kern County with its first carbon capture and storage (CCS) project-related permit application in each calendar year. The program shall include all training requirements identified in owner/operator Best Management Practices and mitigation measures and include training for all field personnel (including owner/operator employees, agents, and contractors). The Worker Environmental Awareness Program shall include protocols and training for responding to and handling of hazardous materials and hazardous waste management, and emergency	Less than significant	Less than significant

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		preparedness, release reporting, and response requirements. The Worker Environmental Awareness Program shall be provided to the surface owner at the time of the application pathway process so the surface owner may educate employees as well. **MM 4.9-2** The owner/operator shall arrange for transportation, storage, and disposal of all hazardous materials in compliance with the Hazardous Materials Transportation Act. Drivers transporting hazardous materials or wastes should follow the measures recommended by the Federal Motor Carrier Safety Administration for avoiding roll-over accidents which include the following standards for cargo tank trucks: a. Avoid sudden movements that may lead to roll-overs. b. Maintain control of the load in turns and on straight roadways. c. Identify in advance of transport high risk areas on designated roads. d. Follow driver mandates for being alert and attentive behind the wheel. e. Control speed and maintain proper "speed cushions" described by the Federal Motor Carrier Safety Administration. **MM 4.9-3** The owner/operator shall implement the following practices based on practices and standards established by the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) safety standards and as amended or modified by the State of California Department of Industrial Relations, Division of Occupational Safety and Health (DOSH – Cal/OSHA) and the Kern County Fire Department. a. Construction activities shall be conducted to allow for easy clean up of spills. Construction crews shall have the appropriate number of tools, supplies, and absorbent and barrier materials to contain and recover spilled materials. b. Fuels and lubricants shall be stored only at designated staging areas. Fuel and lubricant tanks shall have secondary spill containment (e.g., curbs). Compliance with laws and regulations is required, including compliance with hazardous materials and hazardous waste storage laws, as applicable. c. Storage of fuel and lubricants in the staging area shall be at least 100 feet away from the edge of water bodies. Refueling and lubrication of equipment shall be restricted to upland areas at least 100 feet away from stream channels and wetlands. d. Any fuel truck shall carry an oil spill response kit and spill response equipment at all times. e. Owner/operator shall be required to perform all routine equipment maintenance at the well pad or other suitable locations (i.e., maintenance yards), and promptly collect and lawfully dispose of wastes in compliance with existing regulatory requirements. f. Berms and/or dikes (secondary containment) shall be constructed around the permanent above-ground bulk tanks and the foundations shall be installed with a passive leak detection system, so that potential spill materials shall be contained and collected in specified areas isolated from any water bodies. Tanks shall not be placed in areas subject to periodic flooding or washout. Compliance with laws and regulations is required, including compliance with		

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		hazardous materials and hazardous waste storage laws as applicable, including for secondary containment, such as Geologic Energy Management Division regulation (Title 14, C.C.R. § 1773.1), which requires secondary containment in "an engineered impoundment such as a catch basin, which can include natural topographic features, that is designed to capture fluid released from a production facility." g. The appropriate amount and supply of sorbent and barrier materials shall be maintained on construction sites consistent with the type and level of construction activities. Sorbent and barrier materials shall also be utilized to contain runoff from contaminated areas consistent with Cal/OSHA regulations. h. Shovels and drums shall be stored at each well pad or be readily available. If small quantities of soil become contaminated, hand tools shall be used to collect the soil and the material shall be stored in storage drums. Large quantities of contaminated soil may be bio-remediated on-site or at a designated remediation facility, subject to government approval, or collected utilizing heavy equipment, and stored in drums or other suitable containers prior to disposal. Should contamination occur adjacent to staging areas as a result of runoff, shovels and/or heavy equipment shall be utilized to collect the contaminated material. Contaminated soil shall be disposed of in accordance with State and federal regulations. i. Above-ground tanks, valves and other equipment shall be visually inspected monthly and when the tank is refilled. Inspection records shall be maintained. Owner/operator s shall periodically check tanks for leaks or spills. j. Drain valves on all tanks shall be locked to prevent accidental or unauthorized discharges from the tank. k. Equipment maintenance shall be conducted in staging areas or other suitable locations (i.e., maintenance shops or yards). l. The owner/operator shall maintain equipment in operating condition to reduce the likelihood of fuel or oil line breaks and leakage. Any vehicles with chronic or continuous leaks shall be removed from the site and repaired before being returned to operation. **MM 4.9-4** All CCS related CO_2 facility pipelines shall require construction permit site plan review by the Kern County Planning and Natural Resources Department. With the exception of minor deviations of up to 10 feet on either side, the pipeline shall be constructed in the location shown in the construction permit site plan. The site plan shall include the full location of the facility pipeline, width of easement for the pipeline, location and spacing of automatic shut off values, location of infra-red cameras for monitoring, construction and coatings used for the pipeline and all other requirements of federal and State regulations. Safety fencing shall be provided at specific locations along the pipeline to protect critical components such as valves, controls, and safety devices. General reference to “compliance with regulations” will not be considered sufficient. The site plan package shall concurrently be submitted to the Kern County Planning and Natural Resources Department, Kern County Fire Marshall and California State Fire Marshall for review and approval.		

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Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		The plan shall include all details and features to show compliance with 49 CFR Part 195. The U.S. Department of Transportation (U.S. DOT) and the Pipeline and Hazardous Materials Safety Administration (PHMSA) has delegated CO_2 pipeline oversight to the State Fire Marshall, who will evaluate pipelines for compliance with PHMSA. All costs for review by all parties shall be borne by the owner/operator. The owner/operator shall notify the Kern County Public Health Services Environmental Health Division, the Certified Unified Program Agency (CUPA), surface landowner, and sensitive receptors located within 300 feet, of any hazardous materials/waste release, other than CO_2, immediately upon discovery, and to other applicable agencies as required by other laws. The owner/operator shall immediately contain the leak (e.g., by isolating or shutting down the leaking equipment), clean up contaminated media (e.g., soils), and repair the leak prior to recommencing operations. The owner/operator shall report the status and progress of the leak repair and remediation work to the County and the CUPA on monthly intervals or predetermined intervals until the repair has been completed. Contaminated media shall be analyzed according to 22 C.C.R. §§ 66261.21-66261.24 for determination of hazardous waste disposal subject to the Hazardous Waste Determination procedures provided in 22 C.C.R. §66262.11. **MM 4.9-5** Prior to initiation of ground disturbing activities, the owner/operator shall complete Phase II Environmental Site Assessment activities within areas of ground disturbance. Develop a Soil Management Plan for implementation during Project construction activities to properly manage affected soils/wastes that are encountered during ground disturbing activities. **MM 4.9-6** If, during grading or excavation work, the owner/operator observes evidence of contamination or if soil contamination is suspected, work near the excavation site shall be terminated, the work area cordoned off and required health and safety procedures implemented for the location by the contractor's Health and Safety Officer. Samples shall be collected by a trained and qualified individual. Analytical data from suspected contaminated material shall be reviewed by the contractor's Health and Safety Officer. If the sample testing determines that contamination is not present, work may proceed at the site; however, if contamination is detected above regulatory limits, the Kern County Public Health Services Department shall be notified. All actions related to encountering unanticipated hazardous materials at the site shall be documented and submitted to the Kern County Public Health Services Department for legal direction from the regulatory agency. **MM 4.9-7** The owner/operator shall implement measures to prevent the release or accidental spillage of solid waste, garbage, construction debris, sanitary waste, industrial waste, naturally occurring radioactive materials, oil and other petroleum products, and other wastes into water bodies or water sources, including all applicable practices listed below. Other standards may also be utilized, provided that a professional engineer, certified industrial hygienist or certified safety professional certifies to Kern County that such standards are as or more protective of human health and the environment, as compared to the standards in the referenced U.S. Environmental Protection Agency (EPA) Onsite Wastewater Treatment Systems Manual (manual). The following are practices and standards that shall be implemented. a. Classify the various wastes for disposal as described in the EPA manual, and in accordance with applicable California laws and regulations. b. Size reserve pits to avoid overflows.		

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Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		c. Use closed loop mud systems with oil-based muds except in compliance with State Water Resources Board or Regional Water Quality Control Board requirements as provided in Mitigation Measure 4.9-3. d. Review safety data sheets of materials used and use the less toxic material for the operation. e. Design systems with the smallest volumes possible (e.g., drilling mud systems). f. Reduce the amount of excess fluids entering reserve and production pits. g. Keep non-exempt wastes out of reserve or production pits. h. Design the drilling pad to contain stormwater and rigwash. i. Recycle and reuse oil-based muds and high-density brines when such recycling and reuse complies with hazardous waste laws and recycling laws. j. Perform routine equipment inspections and maintenance to prevent leaks or emissions. k. Reclaim oily debris and tank bottoms when such reclamation complies with hazardous waste laws and recycling laws. l. Store only the volume of materials at facilities necessary for permitted work. m. Construct berms around materials and waste storage areas that meet engineering standards to contain spills. n. Perform routine inspections of materials and waste storage areas to locate damaged or leaking containers. o. Train personnel in all waste management practices required by the mitigation measures, all legal standards and the permits issued by Kern County, CalGEM and all regulatory agencies. **MM 4.9-8** The following specific measures should be implemented at a minimum when conducting CCS development activities, as applicable: a. Impervious secondary containment, such as containment dikes, containment walls, and drip pans shall be constructed and maintained around all qualifying petroleum facilities, including tank batteries and separation, and treating areas consistent with the Environmental Protection Agency's Spill Prevention, Control, and Countermeasures regulation (40 Code of Federal Regulations 112). The containment structure must have sufficient volume to contain, at a minimum, the content of the largest storage tank containing liquid hydrocarbons within the facility/battery and engineered freeboard to contain precipitation. Drip pans shall be routinely checked and cleaned of petroleum or chemical discharges and designed to prevent access by wildlife and livestock.as determined by the qualified biologist. b. Chemical containers shall not be stored on bare ground and shall be maintained in good condition and shall be placed within secondary containment in case of a spill or high velocity puncture.		

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		c. Containment dikes are not to be constructed with topsoil or coarse, insufficiently impervious spoil material that is insufficiently impervious to meet requirements. Containment is strongly suggested for produced water tanks. Chemicals shall be placed within secondary containment and stored so that the containers are not in contact with soil or standing water and product and hazard labels are not exposed to weathering. d. Maintain a clean well location. Remove trash, junk, and other materials not in current use. **MM. 4.9-9** Prior to commencement of any construction or grading, the owner/operator is required to provide written evidence of all of the following requirements: 1. Issuance of an EPA UIC Program Construction permit 2. Compliance with all applicable conditions of the approved Conditional Use Permit 3. Compliance with all applicable requirements of the adopted Mitigation Measure and Reporting Program. **MM 4.9-10** Prior to commencement of any testing or full operation to inject CO_2, the owner/operator is required to provide written evidence of all of the following requirements: 1. Written correspondence from the Environmental Protection Agency (Region 9) UIC program to the Kern County Planning and Natural Resources Department that the owner/operator has fully complied with all requirements of the EPA-issued UIC CCS Program permit and EPA is authorizing commencement of injection, for testing or commencement of injection for full operations. 2. Compliance with all applicable conditions of the approved Conditional Use Permit 3. Compliance with all applicable requirements of the adopted Mitigation Measure and Reporting Program. **MM 4.9-11** All sources that provide CO_2 for injection to the CarbonFrontier (Kern County) project must have been disclosed to the Kern County Planning and Natural Resources Department and EPA in writing and be legally permitted to operate by the county or city where they are located. **MM 4.9-12** No confidential information or sources may be used in the operation of this facility. All information provided to the federal government or State of California regarding construction or operation of the facility or incidents at the facility shall be reported concurrently to the Kern County Planning and Natural Resources Department. In the case of emergencies or releases, the information shall be communicated immediately upon discovery to the Kern County Fire Marshall and Public Health with reports to the Kern County Planning and Natural Resources Department within 24 hours after.		
Impact 4.9-2	Potentially significant	Implement **MM 4.9-1** through **4.9-3** and **MM 4.9-5** through **MM 4.9-7,** as described above**,** and	Less than significant	Less than significant

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
Create a Significant Hazard to the Public or the Environment through Reasonably Foreseeable Upset and Accident Conditions Involving the Release of Hazardous Materials into the Environment		**MM 4.9-13** As part of the Hazardous Materials Business Plan and the spill prevention, control, and Countermeasures Plan, the owner/operator shall require annual worker training requirements to: increase awareness of the most common types of failures and methods to avoid mistakes, shall maintain records of employee training, and shall make such records available to the County for review upon request. **MM 4.9-14** The owner/operator shall comply with the California Geologic Energy Management Division requirements for assuring safe drilling and drill casing practices, well design, construction and well management requirements, blowout requirements, and all other provisions of 14 California Code of Regulations 1744 and other applicable Geologic Energy Management Division regulations to any wells being abandoned as a result of the CCS project. The owner/operator shall also reduce the incidence of well control loss by following the practices described in Recommended Practice for Well Control Operations. **MM 4.9-15** The owner/operator shall report project-related contamination, including previously unknown injection wells, of a reportable quantity of hazardous substances, as specified in the Code of Federal Regulations Title 40 and/or the California Code of Regulations Titles 22 and 23, which is discovered during Project construction activities and operations. Notification must be made within 24 hours of discovery to Kern County Public Health Environmental Health Division, Kern County Planning and Natural Resources Department and all State and Federal implementing regulatory agencies that have responsibility or oversight of the specific contamination conditions and activity. The owner/operator shall remediate such contamination as required by the Kern County Environmental Health Division and the appropriate implementing regulatory agency.		
Impact 4.9-3 Emit Hazardous Emissions or Handle Hazardous or Acutely Hazardous Materials, Substances, or Waste within One-Quarter Mile of an Existing or Proposed School	Potentially significant	**MM 4.9-16** The owner/operator shall provide a written notice of the specific location of the approved CCS project Surface Land Area using a map along with Assessor Parcel Numbers (APN) and sections with a link to the Kern County Planning and Natural Resources website all of the following agencies: a. All local school districts within 20 miles b. California Division of State Architect c. California Department of Education. The notice shall be sent within 60 days of the date of the approval of the project and annually by January 31. A final letter shall be sent when the project is decommissioned with information on the responsible party managing the closed facility.	Less than significant	Less than significant
Impact 4.9-4 Be located on a site which is included on a list of Hazardous Materials Sites Compiled Pursuant to Government Code Section 65962.5, and as a result, would create a significant hazard to the public or the environment.	Potentially significant	Implement **MM 4.9-5** and **MM 4.9-6.**	Less than significant	Less than significant

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Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
Impact 4.9-5 For a project located within the Adopted Kern County Airport Land Use Compatibility Plan, would the project result in a Safety Hazard or excessive noise for People Residing or Working in Project Area	Potentially significant	**MM 4.9-17** The owner/operator shall determine whether any proposed construction or alteration meets requirements for notification of the Federal Aviation Administration. If a proposed construction or alteration is found to require notification, the owner/operator shall notify the Federal Aviation Administration and request that the Federal Aviation Administration issue a Determination of No Hazard to Air Navigation. If the Federal Aviation Administration determines that the construction or alteration would result in a potential hazard to air navigation, the owner/operator would be required to work with the Federal Aviation Administration to resolve any adverse effects or airport operations. The owner/operator shall notify the Federal Aviation Administration and the nearest Airport, by completing and submitting Federal Aviation Administration Form 7460-1 if CCS project components or associated development activities are planned that meet one or more of the following criteria: a. Any construction or alteration exceeding 200 feet above ground level. b. Any construction or alteration within 20,000 feet of all public use airports except Poso-kern Airport which exceeds a 100:1 surface from any point on the runway. c. Any construction or alteration within 10,000 feet of the Poso-Kern Airport which exceeds a 50:1 surface from any point on the runway. d. Any construction or alteration within 5,000 feet of a public use heliport which exceeds a 25:1 surface. e. When requested by the Federal Aviation Administration. f. Any construction or alteration located on a public use airport or heliport regardless of height or location.	Less than significant	Less than significant
Impact 4.9-6 Impair Implementation of, or Physically Interfere with, an Adopted Emergency Response Plan or Emergency Evacuation Plan	Potentially significant	Implement **MM 4.17-1** (see Section 4.17, Transportation), and **MM 4.9-18** Prior to commencement of any injection of CO2, and in addition to the emergency response plan required by the EPA UIC permit, the owner/operator shall prepare an emergency incident response plan that addresses, advance leak detection methods and communication with fire responders, emergency medical response, Kern County Fire and Kern County Sheriff notification and protocols for incident management. The plan shall be reviewed and approved by the Kern County Fire Department in consultation with EPA UIC Program, State of California Fire Marshall, Kern County Sheriff and all other State agencies identified by the California Air Resources Board.	Less than significant	Less than significant
Impact 4.9-7 Expose People or Structures either directly or indirectly, to a Significant Risk of Loss, Injury, or Death Involving Wildland	Potentially significant	**MM 4.9-19** The owner/operator is required to implement the following measures: a. Comply with Kern County Fire Codes. b. Maintain firefighting apparatus and supplies required by the Kern County Fire Department. c. Maintain of a list of all relevant firefighting authorities for each work site. d. Have available equipment to extinguish incipient fires and or construction of a fire break, such as: chemical fire extinguishers, shovels, axes, chain saws, etc.	Less than significant	Less than significant

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		e. Carry water or fire extinguishers and shovels in non-passenger vehicles in the field. f. Have and maintain a supply of fire extinguishers for welding, grinding, and brushing crews in compliance with Cal/OSHA regulations. g. Use available resources to protect individual safety and to contain any fire that occurs and notify local emergency response personnel. h. Remove any flammable wastes generated during oil and gas activities regularly. i. Store all flammable materials used in oil and gas activities away from ignition sources and in approved containers. j. Allow smoking only in designated smoking areas. k. Prohibit smoking where flammable products are present and when the fire hazard is high. Train personnel regarding potential fire hazards and their prevention. l. All internal combustion engines, stationary and mobile, shall be equipped with spark arresters. Spark arresters shall be in good working order. m. Light trucks and cars with factory-installed (type) mufflers shall be used only on roads where the roadway is cleared of vegetation. Said vehicle types shall maintain their factory-installed (type) muffler in good condition. n. Fire rules shall be posted on the Project bulletin board at the contractor's field office and areas visible to employees. o. Equipment parking areas and small stationary engine sites shall be cleared of all extraneous flammable materials. p. Personnel shall be trained in the practices of the Fire Safety Plan relevant to their duties. Construction and maintenance personnel shall be trained and equipped to extinguish small fires in order to prevent them from growing into more serious threats. **MM 4.9-20** The owner/operator should restrict the use of chainsaws, chippers, vegetation masticators, grinders, tractors, torches, and explosives at its locations, and ensure the sites where this equipment is used are equipped with portable or fixed fire extinguishers and/or a water tank, with hoses, fire rakes, and other tools to extinguish and or control incipient stage fires. The Worker Environmental Awareness Program shall include fire prevention and response training for workers using these tools.		

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Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
Impact 4.9-8 c. Would implementation of the project generate vectors (flies, mosquitoes, rodents, etc.) or have a component that includes agricultural waste. Specifically, would the project exceed the following qualitative threshold: The presence of domestic flies, mosquitoes, cockroaches, rodents, and/or any other vectors associated with the project is significant when the applicable enforcement agency determines that any of the vectors: i. Occur as immature stages and adults in numbers considerably in excess of those found in the surrounding environment; and ii. Are associated with design, layout, and management of project operations; and iii. Disseminate widely from the property; and iv. Cause detrimental effects on the public health or well-being of the majority of the surrounding population.	Potentially significant	**MM 4.9-21** Owner/operator shall ensure that trash is stored in closed containers and removed from the site at regular intervals. Open containers shall be inverted, and construction ditches shall not be allowed to accumulate water. Construction and maintenance operations shall not generate standing water. Naturally occurring depressions, drainages, or pools at the site shall not be drained or filled without a permit from any regulatory agency having jurisdiction over the resource location.	Less than significant	Less than significant
Impacts 4.9-9 Contribute to Cumulative Hazards and Hazardous Materials Impacts	Potentially significant	Implement **MM 4.9-1** through **MM 4.9-21**, as described above, risk reduction measures, as described in Section 4.6, *Geology and Soils*, and mitigation measures to maintain water quality, as described in Section 4.9, *Hydrology and Water Quality*.	Less than significant	Less than significant
• **Hydrology and Water Quality**	•	•	•	•
Impact 4.10-1 The project would violate water quality standards or waste discharge requirements, or otherwise substantially degrade surface or ground water quality.	Potentially significant	**MM 4.10-1** The owner/operator shall comply with all applicable federal, state, regional and local agency water quality protection laws and regulations, and commonly utilized industry standards, including (where applicable) obtaining coverage under the stormwater construction general permit and industrial general permit issued by the State Water Resources Control Board (SWRCB) and complying with industry stormwater management standards for construction and operational activities. The owner/operator shall obtain Class VI Underground Injection Control (UIC) permit(s) for all new or converted CO_2 wells from the EPA UIC program and fully comply with all requirements. **MM 4.10-2** The project shall comply with the following: 1. In areas subject to National Pollutant Discharge Elimination System stormwater permitting requirements, project owner/operators shall file a Notice of Intent to the State Water Resources Control Board to comply with the statewide General Permit for Discharges of Stormwater Associated with Construction Activities (Construction General Permit State Water Resources Quality Control Board Order No 2009-009-DWO) (as such permit may be amended, revised or superseded) prior to undertaking all ground-disturbing activities greater than one acre and shall	Less than significant	Less than significant

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		prepare and implement a Stormwater Pollution Prevention Plan for construction activities on the Project site in accordance with the Construction General Permit. For facilities requiring coverage under the Construction General Permit, the site-specific Stormwater Pollution Prevention Plan shall include measures to achieve the following objectives: (1) all pollutants and their sources, including sources of sediment associated with construction activity are controlled; (2) all non-stormwater discharges are identified and either eliminated, controlled and treated, (3) site Best Management Practices are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges from construction activity and (4) stabilization Best Management Practices to reduce or eliminate pollutants after construction are completed. The Stormwater Pollution Prevention Plan shall be prepared by a qualified preparer and shall include the minimum Best Management Practices required for the identified risk level. The Stormwater Pollution Prevention Plan shall include a construction site monitoring program that identified requirements for dry weather visual observations of pollutants at all discharge locations and, as applicable, depending on the project risk level, sampling of site effluent and receiving waters. A qualified Stormwater Pollution Prevention Plan practitioner shall be responsible for implementing and all monitoring for the Best Management Practices as well as all inspection, maintenance and repair activities at the project site. If applicable, each project shall also implement and fully comply with the Industrial Storm Water Permit (Order No 97-03-DWO) and Kern County Municipal Stormwater Permit (Order No 5-01-120). All plans under these requirements shall be submitted to Kern County Public Works for review and approval. Any change to this State Water Regional Control Board determination will require full compliance with National Pollutant Discharge Elimination System requirements. 2. Any operator not subject to National Pollutant Discharge Elimination System stormwater permitting requirements shall implement Best Management Practices during construction and operation. All selected practices shall be shown on a drainage implementation plan and self-certified as complete by a licensed professional qualified in drainage and flood control issues. The plan shall be submitted to the Kern County Planning and Natural Resources Department. The following Best Management Practices shall be implemented and shown on the drainage implementation plan: a. Utilizing established facilities design and construction standards as applicable (e.g., American Society for the Testing and Materials (ASTM) American Petroleum Institute (API). b. Implementing good housekeeping and maintenance practices: i. Preventing trash, waste materials and equipment from construction stormwater. ii. Maintaining wellheads, compressors, tanks and pipelines in good condition without leaks or spills. iii. Designing and maintaining graded pads to not actively erode and discharge sediment. iv. Maintaining vehicles in good working order. v. Providing secondary containment for all aboveground storage tanks and maintaining such containment features in good operating condition. c. Implementing spill prevention and response measures:		

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Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		i. Utilizing preventative operating practices such as tank level monitoring, safe chemical handling and conducting regular inspections. ii. Developing and maintaining a spill response plan. iii. Conducting spill response training for employees and have a process to ensure contractors have the necessary training. iv. Maintaining spill response equipment on-site. d. Implementing material storage and management practices: i. Preventing unauthorized access ii. Utilizing "run-on" and "run-off" control berms and swales. iii. Stabilizing exposed slopes through vegetation and other standard slope stability methods. b. The CCS project shall comply with all applicable state, federal and local stormwater management laws. Prior to construction or grading, the owner/operator shall submit a drainage and flood study plan to the Kern County Public Works -Floodplain division for review and approval. The owner/operator shall prepare a drainage plan that complies with requirements to address runoff and the potential for impeding or redirecting 100-year flood flows. The drainage plan shall be prepared in accordance with the Kern County Grading Ordinance, Kern County Green Code, Development Standards and approved by the Kern County Department of Public Works, Floodplain Management Section. The drainage plan shall specify best management practices to prevent all construction pollutants from contacting stormwater, with the intent of keeping sedimentation or any other pollutants from moving off site and into receiving waters. The requirements of the Plan shall be incorporated into design specifications. Recommended best management practices for the construction phase must be shown on a drainage plan, and shall include the following: 1. Erosion Control - Scheduling of construction activities to avoid rain events. 2. Implementing runoff erosion control methods consistent with the drainage plan when vegetation has been removed. 2. Sediment Control - i. Secure stockpiling of soil. ii. Installation of a stabilized construction entrance/exit and stabilization of disturbed areas. 3. Non-stormwater Control - i. Fueling and maintenance of equipment and vehicles shall be managed so as to prevent contamination of runoff from the site. ii. Concrete handling techniques shall be consistent with the drainage plan and shall comply with Mitigation Measure 4.14-15 (m). 4. Waste and Material Management - i. Managing construction materials, consistent with the drainage plan and designating construction staging areas in or around the Project site.		

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Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		ii. Stockpiling and disposing of demolition debris, concrete, and soil in compliance with regulatory requirements and consistent with the drainage plan. iii. Prompt removal and disposal of litter. iv. Disposal of demolition debris, concrete and soil in compliance with regulatory requirements for solid waste. v. Provide and maintain secondary containment to prevent or eliminate pollutants from moving off-site and into receiving waters in compliance with Mitigation Measure 4.8-3. 5. Post-Construction Stabilization - i. Ensuring the stabilization of all disturbed soils per revegetation or application of a soil binder. c. If construction activities will alter federal jurisdictional waters, project owner/operators shall comply with the federal Clean Water Act Section 404 and Section 401 permitting and certification requirements. If construction activities will alter state waters, project owner/operators shall comply with California Department of Fish and Wildlife Streambed Alteration requirements. **MM 4.10-3** All drilling operations must either use a closed-loop system to avoid discharges of drilling muds and fluids, or obtain coverage under the SWRCB low-threat discharge General Order (Waste Discharge Requirements General Order 2003-0003-DWQ), obtain individual Waste Discharge Requirements issued by the Central Valley Regional Water Quality Control Board for the unit, or obtain coverage under a general order issued by the Central Valley Regional Water Quality Control Board applicable to drilling ponds. Any surface ponds or sumps must be cleared of fluids and muds in accordance with the State Water Resources Control Board general order, applicable Water Discharge Requirements and Division of Oil Gas and Geothermal Resources regulations. Compliance with the State Water Resources Control Board or Central Valley Regional Water Quality Control Board low-threat discharge orders or Water Discharge Requirements, if closed-loop systems are not used, and applicable laws, regulations and standards will reduce potential surface water quality impacts from contact with drilling muds or fluids during drilling and construction to less than significant levels. **MM 4.10-4** The owner/operator shall not conduct any Class VI injection activity regulated by the UIC program that discharge into any underground source of current or future beneficial use groundwater, including drinking water. The owner/operator must demonstrate compliance with EPA Class VI UIC permit conditions. **MM 4.10-5** The owner/operator shall not discharge produced water into any surface disposal facility unless the facility has received the Waste Discharge Requirements from the Central Valley Regional Water Quality Control Board, or the need for Water Discharge Requirements has been waived by the Central Valley Regional Water Quality Control Board. As required by the SB 4 regulations, well stimulation treatment fluids and produced fluids from wells that have been stimulated cannot be stored, discharged, or disposed into surface ponds or pits.		
Impact 4.10-2 The project would substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.	Less than significant	Implement **MM 4.19-1** (see Section 4.19, *Utilities and Service Systems*).	Less than significant	Significant and unavoidable

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Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
Impact 4.10-3 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which would: (i) result in a substantial erosion or siltation on- or offsite; (ii) substantially increase the rate of amount of surface runoff in a manner which would result in flooding on-or offsite; (iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or (iv) impede or redirect flood flows.	Potentially significant	Implement **MM 4.10-1** and **MM 4.10-2**.	Less than significant	Less than significant
Impact 4.10-4 The project would, in a flood hazard, tsunami, or seiche zone, risk release of pollutants due to project inundation.	Less than significant	Implement **MM 4.10-1** and **MM 4.10-2**.	Less than significant	Less than
Impact 4.10-5 The project would conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	Less than significant	No mitigation measures are required.	Less than significant	Less than significant
Impact 4.10-6 Contribute to Cumulative Hydrologic Resources Impacts	Potentially significant	Implement of Mitigation Measures **MM 4.9-1, MM 4.10-1, MM 4.10-2, MM 4.10-3, MM 4.10-4, MM 4.10-5**, and **4.19-1** would be required (see Section 4.9, *Hazards and Hazardous Materials*, and Section 4.19, *Utilities and Service Systems*, for full mitigation measure text).	Significant and unavoidable	Significant and unavoidable

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
• **Land Use and Planning**	•	•	•	•
Impact 4.11-1 Physically Divide an Established Community	No impacts	No mitigation measures are required.	No impact	No impact
Impact 4.11-2 Conflict with Any Applicable Land Use Plan, Policy, or Regulation adopted for the purpose of avoiding or mitigating an environmental effect	Less than significant	**MM 4.11 -1** Any proposed use of any portion of the carbon capture and storage (CCS) Surface Land Area for solar or energy storage for electricity for any use on site or off site will require a Conditional Use Permit (CUP) and evaluation of the project under the California Environmental Quality Act (CEQA). Any application submitted to the Kern County Planning and Natural Resources Department for any type of solar or energy storage shall include a written acknowledgement that the solar or energy storage owner/operator is aware that if approved, the CUP will have site specific restrictions and conditions for operation related to the location as part of the CCS Surface Land Area. Any such project would include, but not be limited to, the following mitigation measures: a. No activities are being authorized for use of the area that would involve drilling of any water wells or other exploratory activities that would penetrate the confined cap layer as restricted by the approved CCS CUP. b. No use of the buffer area around the injection well sites is included in any construction activity. c. Written acknowledgement that solar owner, contractor and/or operator has been informed and has a binding agreement to not conduct any activities near or in proximity to either the injection well sites or the capture facilities that would damage the fencing or equipment. d. The solar or energy storage project shall include a Worker Awareness Program for all contractors and employees of the use that the project is within the area for the underground storage of CO_2. e. That the project is bound by all applicable requirements of the Aera CarbonFrontier CCS Project and EIR Mitigation Monitoring and Reporting Plan. **MM 4.11-2** Use of the CCS Surface Land Area is restricted to Agricultural Cultivation (MM 4.10-1), Solar and Energy Storage (MM 4.10-1), and oil and gas exploration and production with appropriate permits. All other uses are prohibited. **MM 4.11-3** The Kern County Building Department Permitting Portal (Accela) shall have a notation in each individual Assessor Parcel Numbers (APN) that is included in the CCS Surface Land Area of the following: **"***This Parcel is included in the approved Carbon Capture and Storage Conditional Use Permit (*CarbonFrontier Project [Kern County] by Aera Energy LLC). *Uses are specifically limited to only the approved Carbon Capture and Storage project, agricultural cultivation, conservation and permitted oilfield activities. No building permits can be issued without specific review and approval from the Kern County Planning and Natural Resources Department for any use."* **MM 4.11-4** No Lot Line Adjustment may be made that adds land to any parcels included in the CCS Surface Land Area without a formal modification of the CUP at a hearing and review under CEQA. Any recorded Lot Line Adjustment to reduce the size of the CCS Surface Land Area to conform to the Approved Area of Review or reduce the parcel used for monitoring or seismic wells may be done administratively by submitting a CUP site plan map with the reduced CCS Surface Land Area shown and notation of the new parcels that are included in the CUP boundary but will be outside	Less than significant	Less than significant

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Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		the CCS Surface Land Area. **MM 4.11-5** Prior to any grading or building or construction, a deed restriction notification document shall be recorded by the applicant with language as approved by the Kern County Planning and Natural Resources Department that gives constructive notice that the CCS Surface Land Area, described by both APNs and legal description, is an approved CCS project subject to a CUP and related Environmental Impact Report (EIR). The document shall be recordable and provide information for access to the following information that shall be updated quarterly, or as applicable: a. Names of operator of CCS facility and physical address of headquarters and email, dates of injection, quantity of injections, and specific injection zone or zones. b. Sixty (60) days before commencing the first injection of CO_2, the applicant shall provide written notice to all owners (surface and mineral) within the CUP boundary and all adjacent property owners (surface and mineral) by certified mail. The notice shall be reviewed and approved, before mailing by the applicant, by the Kern County Planning and Natural Resources Department. **MM 4.11-6** The following APNS are provisionally included in the Aera CarbonFrontier CCS Project Draft EIR for analysis based on pore space characteristics: a. APN 068-200-41 Section 22/T27S/R 20E (66.84 acres) b. APN 068-220-39 Section 36/T27S/R20E (26.17 acres) 1. Written authorization from the legal property owners for both pore space and surface land to be included in the Aera CarbonFrontier CCS Project CUPs must be provided to the Kern County Planning and Natural Resources Department. With written concurrence from the EPA the parcels may be excluded from the project and no authorization is required. 2. If the EPA reports, based on the monitoring evidence, that the approved Area of Review for the underground CCS storage has expanded outside the boundaries of the CCS Surface Land Area, a formal modification of the CUP boundary shall be made at a noticed public hearing at the Kern County Board of Supervisors and all applicable mitigation measures implemented. **MM 4.11-7** All CO2 injected into CarbonFrontier Project must comply with the following criteria. Written evidence of such compliance shall be submitted to the Kern County Planning and Natural Resources Department for review and approval. a. Source of CO_2 must be from an industry within Kern County. b. Only the following industries may send captured CO_2 for injection to the Aera CarbonFrontier CCS Project. 1. Hydrogen – Green		

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Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		2. Hydrogen – Blue 3. Biomass Carbon Removal and Storage 4. Cement production 5. Green Steel production 6. Oilfield field gas streams 7. Power Plants 8. Direct Air Capture 9. Alternative Fuel production B. The source of the captured CO_2 must comply with the following conditions: 1. Projects within unincorporated Kern County: the listed use is approved in an appropriately zoned parcel with CO_2 capture and transport requiring an additional CUP and EIR for compliance with CEQA. 2. Projects within an incorporated City in Kern County: the listed use has capture technology for CO_2 that shows compliance with the preparation of an environmental document, with Kern County as a Responsible Agency and not the use of an exemption from CEQA review. 3. All CO_2 pipelines for transport from offsite sources that traverse unincorporated Kern County land require a CUP and EIR for compliance with CEQA. Any CO_2 pipelines that are permitted by the California Public Utilities Commission (CPUC) for a common carrier company that requests to connect to the Aera CarbonFrontier CCS Project for injection are not covered by this EIR and either (a) must comply with a CUP and EIR by Kern County before injection can commence into the Aera CarbonFrontier CCS Project, or (b) Kern County has participated in the CPUC process and reasonable and feasible mitigation for protection of Kern County communities has been included. 4. The injected CO_2 from an approved source is in full compliance with all requirements of State law and the federal EPA permit.		
Impact 4.11-3 Contribute to Cumulative Land Use and Planning Resource Impacts	Potentially significant	Implement **MM 4.11-1** through **MM 4.11-7**, as described above, and **MM 4.15-1** and **MM 4.15-2,** as described in Section 4.15, *Public Services*.	Less than significant	Less than significant
• **Minerals**	•	•	•	•

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Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
Impact 4.12-1 Result in the Loss of Availability of a Known Mineral Resource that Would be of Value to the Region and the Residents of the State	Potentially significant	No feasible or reasonable mitigation measures.	Significant and unavoidable.	Significant and unavoidable
Impact 4.11-2 Result in the Loss of Availability of a Locally Important Mineral Resource Recovery Site Delineated on a Local General Plan, Specific Plan, or Other Land Use Plan	Potentially Significant	No feasible or reasonable mitigation measures.	Significant and Unavoidable	Significant and unavoidable
Impact 4.11-3 Contribute to Cumulative Mineral Resources Impacts	Potentially Significant	No feasible or reasonable mitigation measures.	Significant and unavoidable	Significant and unavoidable
• **Noise**	•	•	•	•
Impact 4.13-1 Generation of a Substantial Temporary or Permanent Increase in Ambient Noise Levels in the Vicinity of the Project in Excess of Standards Established in the Local General Plan or Noise Ordinance, or Applicable Standards of Other Agencies	Potentially significant	**MM 4.13-1** **CONSTRUCTION** Prior to issuance of any grading or construction permits, the owner/operator shall comply with the following noise information regarding both construction and operations phase of the project. **1.** Noise Site Map A map showing the location of any sensitive receptors within 4,000 feet of the construction activity. A sensitive receptor is defined as a single or multi-family dwelling unit, place of public assembly (a legally permitted place where 100 or more people gather together in a building or structure for the purpose of amusement, entertainment, or retail sales), church, institution, school, or hospital. If there are no sensitive receptors within the 4,000-foot potential impact area, then no construction or operational noise measures shall be required. **2. Noise Standards** 1. For locations where the ambient level is below 65 dB, noise levels from operation of the well may not increase the existing ambient level at the property line of the sensitive receptor by more than 5dB and may not exceed 65 dB at the property line of the sensitive receptor. 2. For locations where the ambient level is at or in excess of 65 dB, noise levels from operation of the well may not increase the existing ambient level at the property line of the sensitive receptor by more than 1 dB. **3. Acoustic Noise Reduction Report** 1. An Acoustic Noise Reduction Report completed by a qualified professional shall be provided if there are sensitive receptors within 4,000 feet. The report and submitted site vicinity map shall include all dimensions and detailed notes, based on the Acoustic Noise Reduction Report detailed in this measure. 2. Clearly marked distances in feet and with coordinates from the construction location on the well site to the nearest sensitive receptors both exterior wall of the receptor and the property line within the potential impact area.	Less than significant	Significant and unavoidable

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		3. Notes showing the average day-night level (DNL or Ldn) of ambient outdoor noise level at the proposed well location and at the property line of the nearest identified sensitive receptors that face the drill site over a 24-hour period. 4. Specific details from the Acoustic Noise Reduction Report specifying the level of project activity noise at the property line of the sensitive receptor allowed under the noise standard and the projected level of noise from the project. 5. The report shall identify and include the specific noise reduction method or methods that will be implemented and shall not include options for compliance. Any changes to the selected method or methods of compliance after approval will require submission of an amended Acoustic Noise Reduction Report reflecting the new selection. **4. Construction** 1. Placement of a temporary sound attenuation wall(s) on property controlled by the applicant or with written permission from the property owner. 2. Construction of a temporary berm on property controlled by the applicant or with written permission from the property owner/ 3. Specific orientation of the drilling equipment on the well site and modification of equipment to reduce noise impacts. 4. Implementation of other detailed sound reduction technologies or practices with evidence from the qualified professional of the reductions achieved. 5. Written confirmation from the occupants of the sensitive receptor(s) of their voluntary, temporary relocation or business restrictions during a defined construction period. **5. Operation** 1. A permanent barrier wall or combination wall and berm that will reduce the noise level from operations to meet the standard. Installation to be completed before commencement of operation of capture equipment and first injection of CO_2. 2. Changes in operational equipment or tempo of operations that will reduce the noise level from operations to meet the standard. **6. Monitoring** **Construction** 1. For the duration of the construction the following measurements shall be submitted to the Kern County Planning and Natural Resources Department at the required intervals. The measurements shall show achievement of the stated average day and night noise level stated on the Site Plan. If the measurement does not show the level is achieved, additional measures must be proposed and installed to prevent a stop		

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		work notice. Failure to submit within one business day after taking the required measurements will result in a stop work notice. 2. 24 hours after completion of all noise attenuation measures and commencement of drilling or rework activities, the applicant shall take a measurement at the ambient level at the property line of the identified, nearest sensitive receptor. 3. Every 14 days after commencement of activities, the applicant shall take a measurement at the ambient level at the property line of the identified, nearest sensitive receptor until completion of construction activities. 4. All installed noise attenuation measures shall be maintained throughout all construction phase activities. **7. Operations** a. Concurrent with the commencement of capture activities and injection of CO_2, agreements with the sensitive receptor property owners shall be completed for 24-hour noise monitoring. An operational noise monitoring report shall include 7 days of 24-hour monitoring at the sensitive receptor property line during normal operations of the CCS project. If the noise standard is not achieved, then additional mitigation for operations is required to be submitted and implemented after review and approval by Kern County Planning and Natural Resources.		
Impact 4.13-2 Exposure of Persons to, or Generate, Excessive Groundborne Vibration or Groundborne Noise Levels	Less than significant	No mitigation measures are required.	Less than significant	Less than significant
Impact 4.13-3 For a Project Located Within the Vicinity of a Private Airstrip or an Airport Land Use Plan or, Where Such a Plan Has Not Been Adopted, Within Two Miles of a Public Airport or Public Use Airport, Would the Project Expose People Residing or Working in the Project Area to Excessive Noise Levels	No impact	No mitigation measures are required.	No impact.	No impact.
Impact 4.13-4 Contribute to Cumulative Noise Impacts	Potentially significant	Implement **MM 4.13-1.**	Significant and unavoidable	Significant and unavoidable
• **Population and Housing**	•		•	•
Impact 4.14-1 Induce Substantial Population Growth in an Area, Either Directly (for example, by proposing new homes and businesses) or	Less than significant	No mitigation measures are required.	Less than significant	Less than significant

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
Indirectly (for example, through extension of roads or other infrastructure).				
Impact 4.14-2 Displace Substantial Numbers of Existing Housing or People, Necessitating the Construction of Replacement Housing Elsewhere	No impact	No mitigation measures are required.	No impact	No impact
Impact 4.14-3 Contribute to Cumulative Population and Housing Impacts	Less than significant	No mitigation measures are required.	Less than significant	Less than significant
• **Public Services**	•	•	•	•
Impact 4.15-1 The project would result in the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection services or police protection services.	Potentially significant	**MM 4.15-1** The project proponent/operator shall work with Kern County to determine how the use of sales and use taxes from construction of the project can be maximized. This process shall include, but is not necessarily limited to, the project proponent/operator obtaining a street address within the unincorporated portion of Kern County for acquisition, purchasing and billing purposes, and registering this address with the State Board of Equalization. As an alternative to the aforementioned process, the project proponent/operator may make arrangements with Kern County for a guaranteed single payment that is equivalent to the number of sales and use taxes that would have otherwise been received (less any sales and use taxes actually paid); with the amount of the single payment to be determined via a formula approved by Kern County. The project proponent/operator shall allow Kern County to use this sales tax information publicly for reporting purposes. **MM 4.15-2** Prior to the issuance of any building permits on the project, the project operator shall submit a letter detailing the hiring efforts prior to commencement of construction, which encourages all contractors of the project site to hire at least 50 percent of their workers from local Kern County communities. The project operator shall provide the contractors a list of training programs that provide skilled workers and shall require the contractor to advertise locally for available jobs, notifying the training programs of job availability, all in conjunction with normal hiring practices of the contractor. **MM 4.15.-3** The following Cumulative Impact Oil and Gas Reservoir Pore Space Charge (CIC-ORPS) shall be implemented as an annual payment due every year for the life of the project or as a lump sum payment for multiple years until the project is decommissioned under MM 4.15-5 or the Conditional Use Permit (CUP) is modified. 1. Prior to grading or construction, a CIC-ORPS site plan shall be submitted by the applicant. The map shall calculate the CIC-ORPS net acreage as follows: 1. Total gross acreage of the approved CUP CCS Surface Land Area. 2. Total acres for the “net” calculation may exclude existing unpaved oilfield roads, public access easements, conservation easements and pipelines utilizing a 50 feet total width easement. All such exclusions are to be mapped and shown as to location on the CIC-ORPS site plan. 3. Calculation for payment of the CIC-ORPS. 2. A payment of from $0 up to $400 per net acre shall be paid annually for all acres in the approved CUP regardless of phased implementation of facilities or the project injection schedule. The payment schedule shall be as follows:	Less than significant	Less than significant

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		1. First 12 months of operation after first injection made, regardless of amount injected or months without injection activity. – no payment 2. Year 2 – Year 6 - $200 per net acre 3. Year 7 – Year 10 - $300 per net acre 4. Year 11 – end of injection - $ 400 per net acre i. The first payment is due on the 13th month after the first date of injection of any CO_2, including any test injection. Annual payments are due every year after based on the date of the first-year payment. ii. d Payments shall be made to the Planning and Natural Resources Department for transfer directly to the County Administrative Office (CAO) Fiscal Division and labeled CIC-ORPS with the project name, location, and Assessor Parcel Numbers. iii. An advance payment option for a lump sum of future payment years, 5 or more years at once, or a reduction in each year's payment for 5 or more years with a lump sum payment at the end of the reduction period, may be requested by submittal of a written request to the Kern County Planning and Natural Resources Department with details of the offer no later than 90 days before the yearly payment is due. The offer shall be reviewed and approved by the CAO. iv. A 10% reduction in the per net acre annual payment shall be granted by the CAO for 3. To qualified injection sources, after submittal of a request, if they meet all of the following criteria. 1. A Qualified Injection Source is a new legally permitted operating facility, that pays local property taxes, located in unincorporated Kern County on land owned by Energy that sends CO_2 to Aera CarbonFrontier (Kern County) for injection. 2. All components of a facility, including onsite accessory electricity production or energy storage count as one facility. Only one 10% reduction will be applied on each facility that qualifies even if phased. 3. The facility must be operating at the time of the first payment that is made that includes the reduction. The reduction will be reviewed annually by the CAO for applicability. 4. Projects on land not owned by Aera Energy or in incorporated cities or other counties or pipelines on Aera Energy land do not qualify. 5. The final determination on meeting the criteria and implementation of the reduction shall be made by the CAO after review of the applicant submittal. Requests for a reduction may be made no earlier than 90 days before the next scheduled payment by written letter to the Kern County Planning and Natural Resources Department who shall verify the location and facility permitting before transmitting to the CAO. 4. If at any time, the Kern County Tax Assessor verifies that the Franchise Tax Board has determined that pore space utilized for storage of CO_2 may be assessed for local property tax and a method for valuation has been established, then the CAO may request the CIC-ORPS amount be adjusted. Reduction for pore space property tax assessment or deletion of the entire CIC-ORPS may only be made by the Kern County Board of Supervisors at a noticed public hearing for the amendment of MM 4.15-3 with appropriate findings of facts. **MM 4.15-4** An annual payment of $250,000 shall be made to the Kern County Planning and Natural Resources Department for transfer to the KCFD for equipment and training specific to the detection and control of emergency situations caused by CO_2. The first payment is due 60 days after the issuance by the U.S. Environmental Protection Agency (EPA) Class VI Underground Injection Control (UIC) permit for construction of any well. Annual payments are due every year on the date of the first-year payment.		

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
		MM 4.15-5 The owner/operator shall provide written notification that the facility is being prepared for closure and the permanent end of injection activities. The following are Kern County requirements for closure and long-term management of the CCS Surface Land Area. A. Within 30 days of the final and last injection of CO_2 and evidence notice has been given to the EPA UIC Director of the end of all injection activities, the first payment of $100,000 (Completion Funding) shall be made, and on that annual date thereafter, to the Kern County Planning and Natural Resources Department for transfer to the CAO. The funding shall be used as determined by the Kern County Board of Supervisors for any budget item as long as consultation with all State and Federal agencies for the 50 years of required monitoring is accomplished. No bond or other instrument of credit may substitute for the required cash Completion Funding payment. Any emergency incident response and related coordination by County departments shall be billed to the owner/operator for full reimbursement at no net cost to Kern County. The Completion Funding shall **not** be reduced or offset by any potential contributions from the State or federal government to Kern County for monitoring and maintenance responsibilities. B. Upon receipt of the one-time Completion Funding, the Kern County Planning and Natural Resources Department shall prepare a modification of the CUP for consideration at a noticed public hearing of the Kern County Board of Supervisors. The modification of the CUP shall include, but not be limited to, the necessary findings and actions to modify CUP conditions to address the carbon capture and storage project is now in long term closure and monitoring, and ending of the annual payments for the CIC-ORPS (MM 4.15-3) and the Fire Department CO_2 mitigation (MM 4.15-4).		
Impact 4.15-2 Contribute to Cumulative Public Service Impacts	Potentially significant	Implement **MM 4.15-1** through **MM 4.15-5**, as described above.	Less than significant	Less than significant
• **Recreation**	•		•	•
Impact 4.16-1 Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities Such That Substantial Physical Deterioration Would Occur or Be Accelerated	Less than significant	No mitigation measures are required.	Less than significant	Less than significant
Impact 4.16-2 Include Recreational Facilities or Require Construction or Expansion of Recreational Facilities That Might Have an Adverse Physical Effect on the Environment	Less than significant	No mitigation measures are required.	Less than significant	Less than significant
Impact 4.16-3 Cumulative Impact on Recreational Facilities	Less than significant	No mitigation measures are required.	Less than significant	Less than significant

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
• **Transportation and Traffic**	•	•	•	•
Impact 4.17-1 The Project would conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.	Less than significant	No mitigation measures are required.	Less than significant	Less than significant
Impact 4.17-2 The Project would Conflict or be Inconsistent With CEQA Guidelines § 15064.3 (b)	Less than significant	No mitigation measures are required.	Less than significant	Less than significant
Impact 4.17-3 The Project would substantially increase hazards due to a design feature (e.g., Sharp Curves or Dangerous intersections) or Incompatible Uses (e.g., farm equipment)	Potentially significant	**MM 4.17-1** Prior to the issuance of construction or building permits, the project proponent/operator shall provide a written statement of any movement of oversized/ overweight vehicles that would require transport over publicly maintained State or County roads. The following shall be implemented for any such transport: a. Obtain all necessary encroachment permits for work within the road right-of-way, or use of oversized/overweight vehicles that will utilize County-maintained roads, which may require California Highway Patrol or a pilot car escort. Copies of the approved traffic plan and issued permits shall be submitted to the Kern County Planning and Natural Resources Department and the Kern County Public Works Department-Development Review. b. Prepare and submit a Construction Traffic Control Plan to Kern County Public Works Department-Development Review and the California Department of Transportation (DOT) offices for District 9, as appropriate, for approval. The Construction Traffic Control Plan must be prepared in accordance with both the California DOT Manual on Uniform Traffic Control Devices and Work Area Traffic Control Handbook and must include, but not be limited to, the following issues: 1. Timing of deliveries of heavy equipment and building materials. 2. Directing construction traffic with a flag person. 3. Placing temporary signing, lighting, and traffic control devices if required, including, but not limited to, appropriate signage along access routes to indicate the presence of heavy vehicles and construction traffic. 4. Ensuring access for emergency vehicles to the project site. 5. Temporarily closing travel lanes or delaying traffic during materials delivery, transmission line stringing ACTIVITIES, or any other utility connections. 6. Maintaining access to adjacent property. 7. Specifying both construction-related vehicle travel and oversize load haul routes, minimizing construction traffic during the AM and PM peak hour, distributing construction traffic flow across alternative routes to access the project sites, and avoiding residential neighborhoods to the maximum extent feasible. 8. Institute construction work hours as necessary, such that the arrival and/or departure times of workers would be staggered, as necessary. 9. Identifying vehicle safety procedures for entering and exiting site access roads.	Less than significant	Less than significant

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
Impact 4.17-4 The Project would Result in Inadequate Emergency Access	Potentially significant	Implement **MM 4.17-1**.	Less than significant	Less than significant
Impact 4.17-5 Contribute to Cumulative Transportation Impacts	Potentially significant	Implement **MM 4.17-1.**	Less than significant	Less than significant
• **Tribal Cultural Resources**				
• **Impact 4.18-1a** • The project would cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k).	• otentially significant	**MM 4.18-1** Prior to issuance of grading or building permit, the owner/operator shall send individual notification letters to all Native American Tribes listed by the California Native American Heritage Commission for the area covered by the Conditional Use Permit (CUP). The notification letter shall include a site plan, list of Assessor Parcel Numbers included in the CUP and contact information for the owner/operator. After operation, the notification letter shall be sent annually by January 31 of each year. A final letter shall be sent as part of the closure plan with contacts for the managing entity for long-term managing and monitoring. The owner/operator shall provide reasonable access and consultation for any tribal representative with concerns or questions about tribal resources that may be within the CCS Surface Land Area or facilities within the CUP.	• ess than significant	• ess than significant
• **Impact 4.18-1b** • The project would cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	• otentially significant	Implement **MM 4.5-1** and **MM 4.18-1**.	• ess than significant	• ess than significant
• **Impact 4.18-2** • Contribute to Cumulative Tribal Cultural Resource Impacts	• otentially significant	• **Implement MM 4.5-1, MM 4.5-3, and MM 4.18-1** (see Chapter 4.5, *Cultural Resources*).	• ess than significant	• ess than significant

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
• **Utilities and Service Systems**	•	•	•	•
Impact 4.19-1 Require or Result in the Relocation or Construction of New or Expanded Water, Wastewater Treatment or Storm Water Drainage, Electric Power, Natural Gas, or Telecommunications Facilities, the Construction or Relocation of Which Could Cause Significant Environmental Effects.	• ess than significant	The improvements are analyzed as part of the construction and operation of the proposed project and analyzed and mitigated in Section 4.10, *Hydrology*.	Less than significant	Less than significant
Impact 4.19-2 Have Sufficient Water Supplies Available to Serve the Project and Reasonably Foreseeable Future Development During Normal, Dry and Multiple Dry Years.	Potentially significant	**MM 4.19-1** Prior to issuance of a construction permit for any carbon capture and storage project applicant, the owner/operator shall provide information on any groundwater or reclaimed water that will be used. Unmetered water wells cannot be used as a source of groundwater for the permit activity. Groundwater may only be used in a permitted activity from a water well equipped with a water meter. The Planning and Natural Resources Department shall compile the water use information in a report that shall be posted on the Kern County Planning and Natural Resources website for public use by December 31 of each calendar year. A copy shall be sent to all Groundwater Sustainability Agencies and the Kern County Water Agency after being posted on the website. The information submitted on the permit shall include the following data: a. The source and estimated amount of any groundwater being used in the permit activity. b. Confirmation that any water well used in permit activity is metered. c. The source and estimated amount of any reclaimed water used in the permit activity.	Less than significant	Significant and unavoidable
Impact 4.19-3 Result in a Determination by the Wastewater Treatment Provider Which Serves or May Serve the Project That it Has Adequate Capacity to Serve the Project's Projected Demand in Addition to the Provider's Existing Commitments.	Less than significant	No mitigation measures are required.	Less than significant	Less than significant
Impact 4.19-4 Generate Solid Waste in Excess of State or Local Standards, or in Excess of the Capacity of Local Infrastructure, or Otherwise Impair the Attainment of Solid Waste Reduction Goals.	Potentially significant	**MM 4.19-2** During construction activities for project facilities, the applicant shall not store construction waste onsite for longer than the duration of the construction activity or transport any waste to any unpermitted facilities. The applicant shall also reduce construction waste transported to landfills by recycling solid waste construction materials, such as taking materials to recycling and reuse locations listed in the brochure on recycling construction and demolition materials available on the Kern County Public Works Department, website.	Less than significant	Less than significant
Impact 4.19-5 Comply with Federal, State, and Local Management and Reduction Statutes and Regulations Related to Solid Waste	Potentially significant	Implement **MM 4.19-2.**	Less than significant	Less than significant

Table 1-3: Aera CarbonFrontier EIR Mitigation Monitoring and Reporting Plan (MMRP)

Impact	Level of Significance before Mitigation	Mitigation Measure(s)	Level of Significance (Project)	Level of Significance (Cumulative)
Impact 4.19-6 Cumulative Impacts on Utilities and Service Systems	Potentially significant	Implement **MM 4.19-1** and **MM 4.19-2**	Significant and unavoidable	Significant and unavoidable
Wildfire				
Impact 4.20-1 Substantially Impair an Adopted Emergency Response Plan or Emergency Evacuation Plan	Less than significant	No mitigation measures are required.	Less than significant	Less than significant
Impact 4.20-2 Due to Slope, Prevailing Winds, and Other Factors, Exacerbate Wildfire Risks, and Thereby Expose Project Occupants to Pollutant Concentrations from a Wildfire or the Uncontrolled Spread of a Wildfire	Less than significant	No mitigation measures are proposed.	Less than significant	Less than significant
Impact 4.20-3 Require the Installation or Maintenance of Associated Infrastructure (Such as Roads, Fuel Breaks, Emergency Water Sources, Power Lines, or Other Utilities) That May Exacerbate Fire Risk or That May Result in Temporary or Ongoing Impacts to the Environment	Less than significant	Implement **MM 4.9-18** through **MM 4.9-20**, found in Section 4.9, *Hazards and Hazardous Materials*.	Less than significant	Less than significant
Impact 4.20-4 Expose People or Structures to Significant Risks Including Downslope or Downstream Flooding or Landslides, as a Result of Runoff, Post-Fire Slope Instability, or Drainage Changes	Less than significant	Implement **MM 4.10-1**, found in Section 4.10, *Hydrology and Water Quality.*	Less than significant	Less than significant
Impact 4.20-5 Contribute to Cumulative Wildfire Impacts	Less than significant	Implement **MM 4.9-18**, **MM 4.9-19**, **MM 4.9-20**, and **MM 4.10-1.**	Less than significant	Less than significant

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Chapter 2

Introduction

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Chapter 2
Introduction

2.1 Intent of California Environmental Quality Act

The Kern County Planning and Natural Resources Department (KCPNR), as Lead Agency, has determined that an Environmental Impact Report (EIR) must be prepared for the proposed Aera CarbonFrontier Project (project) by Aera Energy LLC (Aera Energy). The proposed project requires approval of a Zone Change Case (ZCC No. 4, Map No 51, ZCC No. 3, Map No. 74, ZCC No. 4, Map No. 75) from A-1 (Limited Agriculture) to A (Exclusive Agriculture) on approximately 1,737 acres and from A/NR (Natural Resources – 20-acre minimum) to A (Exclusive Agriculture) on approximately 47 acres and approval of Conditional Use Permits (CUP) (CUP No. 9, Map No. 51, CUP No. 7, Map No. 74, CUP No. 7, Map No. 75, CUP No. 9, Map No. 96, CUP No. 10, Map No. 51, CUP No. 9, Map No. 74, CUP No. 11, Map No. 75) for the construction and operation of an approximately 12,362-acre carbon capture and storage (CCS) facility with related capture facilities and pipeline for carbon dioxide (CO_2) captured from existing sources within the South Belridge oilfield. CCS facilities would be composed of four CO_2 locations of collection: one pre-combustion and three post-combustion sources; up to nine Class VI underground injection control (UIC) wells; up to eight monitoring wells; approximately 14.7 miles of CO_2 facility pipelines; and the CCS Surface Land Area associated with a Storage Space capable of storing up to 40 million metric tons (MMT) of CO_2. None of the CO_2 captured will be used for enhanced oil recovery (EOR).

The project site is located within the Central Valley portion of unincorporated Kern County and is comprised of 45 parcels within the administrative boundaries of the South and North Belridge oilfields (Belridge oilfields). The Belridge oilfields are contiguous and located west of State Route (SR) 33, approximately 7 miles southwest of the community of Lost Hills (population 2,370). Together, the two Belridge oilfields cover an area of approximately 13 miles long and 3 miles wide. Aera Energy is the primary operator within both oilfields.

The main entrance to the South Belridge oilfield is at the private Oasis Road. Primary access to the project site would be from Oasis Road, accessed from Seventh Standard Road, west of SR 33.

The proposed CCS project would capture CO_2 from an initial source of existing produced gas streams (pre-combustion) and emissions from existing stationary sources (post-combustion) within the South Belridge oilfield and transport the CO_2 through a facility pipeline to the North Belridge oilfield for injection at up to nine dedicated Class VI UIC wells. The proposed CO_2 underground Storage Space, which is approximately 2,290 acres in size (maximum modeled CO_2 plume area), would be located within the North Belridge oilfield within the CCS Surface Land Area rights held by Aera Energy and other private owners. Oil and gas production activities would cease within the underground geologic formation where CO_2 would be stored, prior to commencement of the project.

The proposed project at full operation would be designed to store up to roughly 3.3 MMT per year of concentrated CO_2 in the Storage Space (referred to as the 64 Zone reservoir) in the North Belridge oilfield, beginning in 2027 for approximately 20 years, with a total storage capacity of up to 40 MMT of CO_2. In addition to internal sources of CO_2, the project would have capacity to import CO_2 from outside sources, which are discussed in the Source Identification section of this chapter. The project is proposed to be permitted to store up to 3.3 MMT per year. The project would support California's goal of carbon neutrality by 2045 and net negative emissions thereafter (Governor's Executive Order B-55-18) by reducing industrial CO_2 emissions. The proposed CCS facilities, pipelines, Class VI UIC wells, and monitoring wells would be located within the CUP boundary. This EIR has been prepared pursuant to the following:

- The California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000 et seq.)
- CEQA Guidelines (California Code of Regulations, Title 14, Chapter 3, Section 15000 et seq.)
- The Kern County CEQA Implementation Document

The overall purposes of the CEQA process are to:

- Ensure that the environment and public health and safety are protected in the face of discretionary projects initiated by public agencies or private concerns.
- Provide for full disclosure of the project's environmental effects to the public, the agency decision makers who will approve or deny the project, and responsible and trustee agencies charged with managing resources (for example, wildlife, air quality) that may be affected by the project.
- Provide a forum for public participation in the decision-making process with respect to environmental effects.

2.2 Purpose of Environmental Impact Report

An EIR is a public informational document used in the planning and decision-making process. This project-level EIR analyzes the environmental impacts of the project. The Kern County Planning Commission and Board of Supervisors will consider the information in the EIR, including the public comments and staff response to those comments, during the public hearing process. The final decision is made by the Board of Supervisors, who may approve, conditionally approve, or deny the project. The purpose of an EIR is to identify the following:

- The significant potential impacts of the project on the environment and the manner in which those significant impacts can be avoided or mitigated
- Any unavoidable adverse impacts that cannot be mitigated

- Reasonable and feasible alternatives to the project that would eliminate any significant adverse environmental impacts or reduce the impacts to a less than significant level

An EIR also discloses growth-inducing impacts; impacts found not to be significant; and significant cumulative impacts of the project when taken into consideration with past, present, and reasonably anticipated future projects.

CEQA requires that an EIR reflect the independent judgment of the lead agency regarding the impacts, the level of significance of the impacts both before and after mitigation, and mitigation measures proposed to reduce the impacts. A Draft EIR is circulated to responsible agencies, trustee agencies with resources affected by the project, and interested agencies and individuals. The purposes of public and agency review of a Draft EIR include sharing expertise, disclosing agency analyses, checking for accuracy, detecting omissions, discovering public concerns, and soliciting mitigation measures and alternatives capable of avoiding or reducing the significant effects of the project, while still attaining most of the basic objectives of the project.

Issues to Be Resolved

Section 15123(b) (3) of the *CEQA Guidelines* requires that an EIR contain issues to be resolved, which include the choices among alternatives and whether or how to mitigate significant impacts. The major issues to be resolved regarding a project include the following decisions by the lead agency:

- Determine whether the Draft EIR adequately describes the environmental impacts of the project
- Identify a preferred choice among alternatives
- Determine whether the recommended mitigation measures should be adopted or modified
- Determine whether additional mitigation measures need to be applied to the project

2.3 Terminology

To assist readers in understanding this EIR, terms used are defined in the following manner:

- ***Project*** means the whole of an action that has the potential for resulting in a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment.
- ***Environment*** means the physical conditions that exist within the area that will be affected by the proposed project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance. The area involved is the locale in which significant direct or indirect impacts would occur as a result of the project. The environment includes both natural and human-created conditions.

- ***Impacts*** analyzed under CEQA must be related to a physical change. Impacts are as follows:
  - Direct or primary - Impacts that would be caused by the proposed project and would occur at the same time and place of project implementation; or
  - Indirect or secondary - Impacts that are caused by the proposed project at a later time or farther removed in distance but are still reasonably foreseeable. Indirect or secondary impacts may include growth-inducing impacts and other effects related to induced changes in the pattern of land use, population density or growth rate, or related effects on air, water, and other natural systems, including ecosystems.
- ***Significant impact on the environment*** means a substantial, or potentially substantial, adverse change in any of the physical conditions in the project vicinity affected by the proposed project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance. An economic or social change resulting from a project by itself is not considered a significant impact on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant.
- ***Mitigation*** consists of measures to avoid or substantially reduce the proposed project's significant environmental impacts by doing the following:
  - Avoiding the impacts altogether by not taking a certain action or parts of an action
  - Minimizing impacts by limiting the degree or magnitude of the action and its implementation
  - Rectifying the impact by repairing, rehabilitating, or restoring the affected environment
  - Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the actions
  - Compensating for the impacts by replacing or providing substitute resources or environments
- ***Cumulative Impacts*** are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The following statements also apply when considering cumulative impacts:
  - The individual impacts may be changes resulting from a single project or separate projects.
  - The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over time.

This EIR uses a variety of terms to describe the level of significance of adverse impacts. These terms are defined as follows:

- ***Less than significant***: An impact that is adverse but that does not exceed the defined thresholds of significance. Less than significant impacts do not require mitigation.
- ***Significant***: An impact that exceeds the defined thresholds of significance and would or could cause a substantial adverse change in the environment. Mitigation measures are recommended to eliminate the impact or reduce it to a less than significant level.
- ***Significant and unavoidable***: An impact that exceeds the defined thresholds of significance and cannot be eliminated or reduced to a less than significant level through the implementation of mitigation measures.

2.4 Decision-Making Process

CEQA requires lead agencies, in this case Kern County, to solicit and consider input from other interested agencies, citizen groups, and individual members of the public. CEQA also requires the project to be monitored after it has been permitted to ensure that mitigation measures are carried out.

CEQA requires the lead agency to provide the public with a full disclosure of the expected environmental consequences of the project and with an opportunity to provide comments. In accordance with CEQA, the following is the process for public participation in the decision-making process:

- **Notice of Preparation (NOP).** Kern County prepared and circulated an NOP to the State Clearinghouse, public agencies, special districts, responsible and trustee agencies, and other interested parties for review and comment on June 9, 2023. In conjunction with this public notice, a scoping meeting was held by Kern County on June 23, 2023. The purpose of the meeting was to introduce the project and to solicit input from agencies, organizations, and other interested parties regarding the proposed project, alternatives, mitigation measures, and environmental impacts to be analyzed in the EIR. The NOP, scoping meeting materials, comment letters received, and a complete summary of all questions received during the scoping meeting are included in Appendix A of this EIR.
- **Draft EIR Preparation/Notice of Completion.** A Draft EIR is prepared, incorporating public and agency responses to the NOP and the scoping process. The Draft EIR is circulated for review and comment to appropriate agencies and additional individuals and interest groups who have requested to be notified of EIR projects. Per Section 15105 of the *CEQA Guidelines*, Kern County will provide for a 45-day public review period on the Draft EIR. Kern County will subsequently respond to each comment on the Draft EIR received in writing through a Response to Comments chapter in the Final EIR. The Response to Comments will be provided to each agency or person who provided written comments on

the EIR a minimum of 10 business days before the scheduled Planning Commission hearing on the Final EIR and project.

- **Preparation and Certification of Final EIR**. The Kern County Planning Commission will consider the Final EIR and the project, acting in an advisory capacity to the Kern County Board of Supervisors. Upon receipt of the Planning Commission's recommendation, the Board of Supervisors will also consider the Final EIR, all public comments, and the project, and take final action on the project. Both the Planning Commission and the Board of Supervisors will hold at least one public meeting to consider the Final EIR, take public testimony, and then approve, conditionally approve, or deny the project.

2.4.1 Notice of Preparation

In accordance with CEQA Guidelines Section 15082 (a) (Notice of Preparation) and the County's Guidelines, the KCPNR circulated an NOP for a 30-day public review. The NOP was sent to the State Clearinghouse, public agencies, special districts, responsible and trustee agencies, and other interested parties for a public review period that began on June 11, 2023, and ended on July 10, 2023.

The purpose of the NOP is to formally covey that KCPNR, as the Lead Agency, solicited input regarding the scope and proposed content of the Draft EIR. The NOP, scoping meeting, and community workshop materials, comment letters received, and a complete summary of all scoping comments are included as Appendix A.

2.4.2 Scoping Meeting

Pursuant to Section 15082 (c)(1) of the CEQA Guidelines, for projects of statewide, regional, or area-wide significance, the Lead Agency is required to conduct at least one scoping meeting. The scoping meeting is for jurisdictional agencies and interested persons or groups to provide comments on topics including the range of actions, alternatives, mitigation measures, and environmental effects to be analyzed. Kern County hosted a scoping meeting on June 23, 2023, at the KCPNR, located at 2700 "M" Street, Suite 100, Bakersfield, California. During the June 23, 2023, scoping meeting, no members of the public were present, and no testimony was given.

NOP and Scoping Meeting Results

Specific environmental concerns raised in written comments received during the NOP public review period are summarized below. The NOP and all comments received are included in Appendix A.

NOP Written Comments

The County received nine letters with potentially substantive comments in response to the NOP. The comments are summarized in Table 2-1.

Table 2-1: Summary of Comments on the NOP for the EIR

Commenter	Summary of Comment
State	
Native American Heritage Commission Letter June 13, 2023	Recommends consultation with Native American tribes in geographic area. Compliance with AB 52 and SB 18 and provides recommendations for cultural resource assessment.
State of California – Natural Resources Agency Department of Fish and Wildlife Letter July 6, 2023	Indicates special status species are known to exist in the vicinity of the project size. Recommends that a habitat assessment be conducted at and in the vicinity of the project site for: San Joaquin kit fox, blunt-nosed leopard lizard, California jewel flower, giant kangaroo rat, Tipton kangaroo rat, San Joaquin antelope squirrel, tricolored blackbird, Swainson's hawk, Buena Vista Lake ornate shrew, San Joaquin woolly threads, Kern mallow, Temblor legless lizards, Crotch's bumble bee, burrowing owl, short-nosed kangaroo rat, Tulare grasshopper mouse, western spadefoot, American badger, San Joaquin coachwhip, Le Conte's thrasher, California alkali grass, Coulter's goldfields, heartscale, Lost Hills crownscale, recurved larkspur, showy golden madia, and Hoover's eriastrum. Suggests the EIR should include either measures to avoid take of species found to occur at or near the project site, or the project proponent's commitment to obtaining incidental take authorization under Section 2081 of Fish and Game Code, as appropriate, if avoidance would be infeasible.
CalGEM Email July 10, 2023	Indicates that the applicant shall obtain permits/approvals from the respective agencies as required and shall file proper permitting with CalGEM for any required oil and gas operations.
Caltrans Email July 25, 2023	Recommends a transportation impact study scoping meeting with Caltrans. District 6 staff to discuss the most appropriate methodology for the analysis. Suggests that Vicinity maps, regional location maps, and a site plan clearly showing project access in relation to nearby roadways and key destinations, ingress, and egress for all project components should be clearly identified. Indicates that the EIR should identify, evaluate, and propose mitigation for potential impacts to the SHS, including the entire width of the State right-of-way. Indicates that any work completed in the State's right-of-way will require a Caltrans encroachment permit. Indicates that prior to an encroachment permit application submittal, the project proponent is required to schedule a "Pre-Submittal" meeting with District 6 Encroachment Permit Office.
Local Agencies	
Public Works Department Floodplain Management Section Email June 14, 2023	Indicates the subject property is subject to flooding. Recommends associated flood hazard requirements will need to be incorporated into the design of the project per Kern County Floodplain Management Ordinance.
Kern County Public Works Letter July 10, 2023	Recommends that, prior to issuance of a building or grading permit, all survey monuments shall be tied out by a Licensed Land Surveyor. Recommends that, prior to final inspection, all survey monuments that were destroyed during construction shall be reset or have a suitable witness corner set. Recommends that, upon completion of the project, all survey monuments shall be accessible by a Licensed Land Surveyor or their representative with prior notice.
San Joaquin Valley	Recommends that a more detailed preliminary review of the project be conducted for the project's construction and operational emissions.

Table 2-1: Summary of Comments on the NOP for the EIR

Commenter	Summary of Comment
Air Pollution Control District Letter July 20, 2023	Recommends project utilize the cleanest available off-road construction equipment. Recommends incorporation of design elements such as the use of cleaner Heavy Heavy-Duty (HHD) trucks and vehicles, measures that reduce Vehicle Miles Traveled (VMTs), and measures that increase energy efficiency. Recommends the environmental review include a discussion characterizing an appropriate trip length distance for HHD truck travel. Indicates that the additional environmental review should consider using California Emission Estimator Model (CalEEMod). Recommends that the County evaluate the risk associated for sensitive receptors in the area and mitigate any potentially significant risk. Suggests that a Prioritization and/or a Health Risk Assessment (HRA) should be performed. Recommends an Ambient Air Quality Analysis (AAQA) be performed if emissions exceed 100 pounds per day of any pollutant. Recommends the EIR include a discussion on the implementation of a Voluntary Emission Reduction Agreement (VERA), which provides pound-for-pound mitigation of emissions increases through a process that develops, funds, and implements emission reduction projects, with the District serving a role of administrator of the emissions reduction projects and verifier of the successful mitigation effort. Indicates the project should comply with applicable District rules and regulations.
Interested Parties	
Center for Biological Diversity & Central California Environmental Justice Network Letter July 3, 2023	Indicates disagreement with the premise that the project should play a role in achieving California's goal of reaching near-zero emissions. Suggests that the County phase out fossil fuel development. Expresses that underground storage of carbon can contaminate drinking water, trigger earthquakes, and result in carbon leaks. Emphasizes that the County must adequately define the project and analyze the potential impacts to the environment in detail.
Yuhaaviatam of San Manuel Nation Email June 29, 2023	Indicates the project is outside of Serrano ancestral territory. Indicates that YSMN will not be requesting to receive consulting party status with the lead agency or to participate in the scoping, development, or review of documents created pursuant to legal and regulatory mandates.

Key:
AAQA = Ambient Air Quality Analysis
CalEEMod = California Emission Estimator Model
Caltrans = California Department of Transportation
CalGEM = California Geologic Energy Management Division
EIR = Environmental Impact Report
HHD = Heavy Heavy-Duty
HRA = Health Risk Assessment
NOP = Notice of Preparation
VMT = Vehicle Miles Traveled
YSMN = Yuhaaviatam of San Manuel Nation

2.4.3 Availability of the Draft EIR

This Draft EIR is being distributed directly to agencies, organizations, and interested groups and persons for comment during a 45-day formal review period in accordance with Section 15087 of

the CEQA Guidelines. This Draft EIR and the full administrative record for the project, including all studies, is available for review during normal business hours Monday through Friday at the Kern County Planning Department:

Kern County Planning and Natural Resources Department
2700 "M" Street, Suite 100
Bakersfield, CA 93301-2370
Contact: Keith Alvidrez, Lead Planner
Phone: (661) 862-5015, Fax: (661) 862-8601
Alvidrezk@kerncounty.com

2.5 Format and Content

This EIR addresses the potential environmental effects of the project and was prepared following input from the public and responsible and affected agencies, and through the EIR scoping process, as discussed previously. The contents of this EIR were based on the findings in the NOP, and public and agency input. Based on the findings of the NOP, a determination was made that an EIR was required to evaluate potentially significant environmental effects on the following resources:

- Aesthetics and Visual Resources
- Agricultural and Forest Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation
- Tribal Cultural Resources
- Utilities and Service Systems
- Wildfire

2.5.1 Required EIR Content and Organization

Table 2-2 contains a list of sections required under CEQA, along with a reference to the chapter in which they can be found in this document.

Table 2-2: Required EIR Contents

Requirement (CEQA Section)	Location in EIR
Table of Contents (Section 15122)	Table of Contents
Summary (Section 15123)	Chapter 1
Project Description (Section 15124)	Chapter 3
Environmental Setting (Section 15125)	Chapter 4
Significant Environmental Impacts (Section 15126.2)	Chapter 4
Environmental Setting	Chapter 4
Mitigation Measures (Section 15126.4)	Chapter 4
Cumulative Impacts (Section 15130)	Chapter 4
Effects Found not to be Significant (Section 15128)	Chapters 1, 4, and 5
Unavoidable Significant Environmental Impacts (Section 15126.2(c))	Chapters 4 and 5
Significant Irreversible Changes (Section 15126.2(d))	Chapter 5
Growth-Inducing Impacts (Section 15126.2(c))	Chapter 5
Alternatives to the Proposed Project (Section 15126.6)	Chapter 6
Organizations and Persons Consulted (Section 15129)	Chapter 8
List of Preparers (Section 15129)	Chapter 9
References (Section 15148)	Chapter 10

Key:
CEQA = California Environmental Quality Act
EIR = Environmental Impact Report

The content and organization of this EIR are designed to meet the requirements of CEQA and the CEQA Guidelines, as well as to present issues, analysis, mitigation, and other information in a logical and understandable way. This EIR is organized into the following sections:

- Chapter 1, *Executive Summary*, provides a summary of the project description and a summary of the environmental impacts and mitigation measures.
- Chapter 2, *Introduction*, provides CEQA compliance information, an overview of the decision-making process, organization of the EIR, and a responsible and trustee agency list.

- Chapter 3, *Project Description*, provides a description of the location, characteristics, and objectives of the projects, and the relationship of the projects to other plans and policies associated with the project.
- Chapter 4, *Environmental Setting*, *Impacts, and Mitigation Measures*, contains a detailed environmental analysis of the existing conditions, projects impacts, mitigation measures, and cumulative impacts.
- Chapter 5, *Consequences of Project Implementation*, presents an analysis of the project's cumulative and growth-inducing impacts and other CEQA requirements, including significant and unavoidable impacts and irreversible commitment of resources.
- Chapter 6, *Alternatives*, describes a reasonable range of alternatives to the projects that could reduce the significant environmental effects that cannot be avoided.
- Chapter 7, *Responses to Comments*, is reserved for responses to comments on the EIR.
- Chapter 8, *Organizations and Persons Consulted*, lists the organizations and persons contacted during preparation of this EIR.
- Chapter 9, *Preparers*, identifies persons involved in the preparation of the EIR.
- Chapter 10, *Bibliography*, identifies reference sources for the EIR.
- Appendices provide information and technical studies that support the environmental analysis contained within the EIR.

The analysis of each environmental category in Chapter 4 is organized as follows:

- "Introduction" provides a brief overview on the purpose of the section being analyzed with regards to the project.
- "Environmental Setting" describes the physical conditions that exist at this time and that may influence or affect the topic being analyzed.
- "Regulatory Setting" provides State and federal laws and the Kern County General Plan (KCGP) goals, policies, and implementation measures that apply to the topic being analyzed.
- "Impacts and Mitigation Measures" discusses the impacts of the projects in each category, presents the determination of the level of significance, and provides a discussion of feasible mitigation measures to reduce any impacts.
- "Cumulative Setting, Impacts, and Mitigation Measures" provides a discussion of the cumulative geographic area for each resource area, and analysis of whether the project would contribute to a significant cumulative impact, and if so, identifies cumulative mitigation measures.

2.6 Responsible and Trustee Agencies

Projects or actions undertaken by the lead agency, in this case, the KCPNR, may require subsequent oversight, approvals, or permits from other public agencies in order to be implemented. Other such agencies are referred to as "responsible agencies" and "trustee agencies." Pursuant to Sections 15381 (Responsible Agency) and 15386 (Trustee Agency) of the State *CEQA Guidelines*, as amended, responsible agencies and trustee agencies are defined as follows:

- A "responsible agency" is a public agency that proposes to carry out or approve a project, for which a lead agency is preparing or has prepared an EIR or Negative Declaration. For the purposes of CEQA, the term "responsible agency" includes all public agencies other than the lead agency that have discretionary approval power over the project (Section 15381).
- A "trustee agency" is a state agency having jurisdiction by law over natural resources affected by a project that are held in trust for the people of the State of California (Section 15386).

The various public, private, and political agencies and jurisdictions with a particular interest in the project include the following:

Federal Agencies

- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency

State Agencies

- California Air Resources Board
- California Department of Conservation, Geologic Energy Management Division
- California Department of Fish and Wildlife
- California Department of Public Health
- California Department of Toxic Substances Control
- California Energy Commission
- California Highway Patrol
- California Native American Heritage Commission
- California Office of Historic Preservation
- California State Lands Commission

- Governor's Office of Planning and Research
- Office of the State Fire Marshall
- Regional Water Quality Control Board, Central Valley District
- State Water Resources Control Board

Local Agencies

- San Joaquin Air Pollution Control District
- Kern Council of Governments
- Kern County Public Works Department, Operations Division
- Kern County Public Works Department, Engineering and Surveying Services Division
- Kern County Fire Department
- Kern County Planning and Natural Resources Department
- Kern County Public Health Services Department, Environmental Health Division
- Kern County Public Services Department, Development Review Division
- Kern County Planning Commission
- Kern County Board of Supervisors

2.7 Incorporation by Reference

In accordance with Section 15150 (Incorporation by Reference) of the State CEQA Guidelines, to reduce the size of the report, the following documents are hereby incorporated by reference into this EIR and are available for public review at the KCPNR. A brief synopsis of the scope and content of these documents is provided below.

Kern County General Plan

The KCGP is a policy document with planned land use maps and related information and is designed to give long-range guidance to those County officials making decisions affecting the growth and resources of the unincorporated Kern County jurisdiction, excluding the Metropolitan Bakersfield Planning Area. This document, adopted on June 14, 2004, and last amended on September 22, 2009, helps to ensure that day-to-day decisions conform to the long-range program designed to protect and further the public interest as related to the County's growth and development and to mitigate environmental impacts. The KCGP also serves as a guide to the private sector of the economy in relating its development initiatives to the County's public plans, objectives, and policies.

Kern County Zoning Ordinance

According to Chapter 19.02.020, Purposes, Title 19 was adopted to promote and protect the public health, safety, and welfare through the orderly regulation of land uses throughout the unincorporated area of the County. Further, the purposes of this title are as follows:

- Provide the economic and social advantages resulting from an orderly planned use of land resources
- Encourage and guide development consistent with the KCGP
- Divide Kern County into Zoning Districts of a number, size, and location deemed necessary to carry out the purposes of the KCGP and this title
- Regulate the size and use of lots, yards, and other open spaces
- Regulate the use, location, height, bulk, and size of buildings and structures
- Regulate the intensity of land use
- Regulate the density of population in residential areas
- Establish requirements for off-street parking
- Regulate signs and billboards
- Provide for the enforcement of the regulations of Chapter 19.02

Kern County Oil and Gas Ordinance (2021) and Final Supplemental Recirculated EIR

Kern County has previously developed revisions to the Kern County Zoning Ordinance for local permitting for oil and gas, focused on Chapter 19.98 (Oil and Gas Production), referred to as the "Oil and Gas Ordinance." The Oil and Gas Ordinance establishes updated development and implementation standards and conditions to address environmental impacts of oil and gas development activities, and new ministerial permit procedures for County approval of future well drilling and operations, to ensure compliance with the updated development and implementation standards and conditions and provide for ongoing tracking and compliance monitoring. Potential impacts of oil and gas development under the Oil and Gas Ordinance were evaluated in the Final Environmental Impact Report–Revisions to the Kern County Zoning Ordinance–2015(C) Focused on Oil and Gas Local Permitting, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental and Recirculated EIR certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). On March 22, 2024, the County issued an NOP for a Second Supplemental Recirculated EIR to address three CEQA issues identified in a March 7, 2024, Court of Appeal decision. As ordered by the Court, the County has continued to suspend permitting under the Oil and Gas Ordinance until the Second Supplemental Recirculated EIR is certified and the ordinance is readopted.

The Oil and Gas EIR is incorporated by reference in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. As described in the Oil and Gas EIR, oil and gas activities consist of the following:

- Construction activities, including well pad and access road construction, well drilling, well completion and testing, distribution line construction, well reworking and workovers, well decommissioning, and well abandonment, and construction of ancillary facilities such as pipelines and tanks
- Operational activities, including produced fluids and natural gas treatment, water management, well stimulation treatment, EOR activities, and water and waste gas injection via injection wells, operation of ancillary facilities, and well and ancillary facility maintenance

Significant cumulative impacts of oil and gas activities identified in the Oil and Gas EIR include impacts to aesthetics, agriculture and forest resources, air quality, biological resources, cultural resources, greenhouse gases, hydrology and water quality, and utilities and services (water supply). Each of these contributions to cumulative impacts from past, present, and reasonably foreseeable future oil and gas development may occur together with those of CTV I.

2.8 Sources of Information

This EIR is dependent upon information from many sources. Some sources are studies or reports that have been prepared specifically for this document. Other sources provide background information related to one or more issue areas that are discussed in this document. The sources and references used in the preparation of this EIR are listed in Chapter 10, *Bibliography*, and are available for review by appointment during normal business hours at:

Kern County Planning and Natural Resources Department
2700 "M" Street, Suite 100
Bakersfield, California 93301-2370
Contact: Keith Alvidrez, Lead Planner
alvidrezk@kerncounty.com

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Chapter 3

Project Description

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Chapter 3

Project Description

3.1 Project Overview

This Environmental Impact Report (EIR) has been prepared to identify and evaluate potential environmental impacts associated with implementation of the proposed Aera CarbonFrontier Project (project) by Aera Energy LLC (Aera Energy, or the project proponent).

The proposed project is the consideration of the approval of a Zone Change Case (ZCC No. 4, Map No 51, ZCC No. 3, Map No. 74, ZCC No. 4, Map No. 75) from A-1 (Limited Agriculture) to A (Exclusive Agriculture) on approximately 1,737 acres and from A/NR (Natural Resources – 20-acre minimum) to A (Exclusive Agriculture) on approximately 47 acres and approval of Conditional Use Permits (CUPs) (CUP No. 9, Map No. 51, CUP No. 7, Map No. 74, CUP No. 7, Map No. 75, CUP No. 9, Map No. 96, CUP No. 10, Map No. 51, CUP No. 9, Map No. 74, CUP No. 11, Map No. 75) for the construction and operation of an approximately 12,362-acre carbon capture and storage (CCS) facility with related capture facilities and pipeline for carbon dioxide (CO_2) captured from existing sources within the South Belridge oilfield.

The project site is located within the Central Valley portion of unincorporated Kern County and is comprised 45 parcels within the administrative boundaries of the South and North Belridge oilfields (Belridge oilfields).

Aera Energy proposes to construct and operate a CCS facility on approximately 12,362 acres of privately owned land. CCS facilities would be composed of four carbon dioxide (CO_2) locations of collection: one pre-combustion and three post-combustion sources; up to nine Class VI underground injection control (UIC) wells; up to eight monitoring wells; approximately 14.7 miles of CO_2 facility pipelines; and the CCS Surface Land Area associated with a Storage Space capable of storing up to 40 million metric tons (MMT) of CO_2. None of the CO_2 captured will be used for enhanced oil recovery (EOR).

The source of CO_2 for injection as part of this project would be the pre-combustion (Pre-C) produced field gas stream from South Belridge oilfield and post-combustion (Post-C) flue gas. In addition to Aera internal sources of CO_2, the project would have the capacity to receive CO_2 from outside sources.

The proposed CCS project would capture CO_2 from an initial source of existing produced gas streams (pre-combustion) and emissions from existing stationary sources (post-combustion) within the South Belridge oilfield and transport the CO_2 through a facility pipeline to the North Belridge oilfield for injection at up to nine dedicated Class VI UIC wells. The proposed CO_2 underground Storage Space, which is approximately 2,290 acres in size (maximum modeled CO_2 plume area), would be located within the North Belridge oilfield within the CCS Surface Land Area rights held by Aera Energy and other private owners. Oil and gas production would cease within the

underground geologic formation where CO_2 would be stored, prior to commencement of the project.

The proposed project at full operation would be designed to store up to roughly 3.3 MMT per year of concentrated CO_2 in the Storage Space (referred to as the 64 Zone reservoir) in the North Belridge oilfield, beginning in 2027 for approximately 20 years, with a total storage capacity of up to 40 MMT of CO_2. In addition to internal sources of CO_2, the project would have capacity to import CO_2 from outside sources, which are discussed in the Source Identification section of this Chapter. The project is proposed to be permitted to store up to 3.3 MMT per year. The project would support California's goal of carbon neutrality by 2045 and net negative emissions thereafter (Governor's Executive Order B-55-18) by reducing industrial CO_2 emissions. The proposed CCS facilities, pipelines, Class VI UIC wells, and monitoring wells would be located within the CUP boundary (see Figure 3-1: Vicinity Map). The proposed project includes the following components:

- **CO_2 Capture Facilities.** One pre-combustion capture facility and three post-combustion capture facilities.
- **Pipelines.** An approximately 10-mile, 6- to 12-inch main aboveground CO_2 facility pipeline, and approximately 4.7 miles of CO_2 distribution facility pipelines extending from the main facility pipeline to each injection well, would be constructed. Approximately 6.5 miles of produced gas lines, up to 4.5 miles of potential water line routes, and approximately 10 miles of steam line routes, would also be constructed.
- **Wells.** Construction and operation of up to nine Class VI injection wells, of which five existing wells would be converted, and four new wells would be developed. Up to eight existing wells would be converted for monitoring of the injected CO_2. Up to 40 existing oil wells would be plugged and abandoned within the North Belridge oilfield. Prior to plugging, one existing well would have a fiberoptic cable installed that, in conjunction with the California Integrated Seismic Network, would be used to monitor seismic activity at the site. Additionally, up to 40 existing wells that were abandoned within the North Belridge oilfield would be re-abandoned to meet current State and federal plugging requirements and 21 operational production wells would be plugged and abandoned within the proposed CCS facility areas in South Belridge.
- **Access Roads.** Maintenance and repair of existing field access roads.
- **Water Systems.** Construction of water treatment facilities at each of the CO_2 capture facilities for treatment of produced water.
- **Electrical Transmission/Substations.** Construction of approximately 6,840 feet of 115 kV overhead transmission lines from the existing Aera Energy-owned electrical supply grid to two new electrical substations located adjacent to the CO_2 capture facilities.
- **Networks.** Electrical power distribution, and supervisory control and data acquisition (SCADA) networks.

Figure 3-1: Regional Vicinity Map

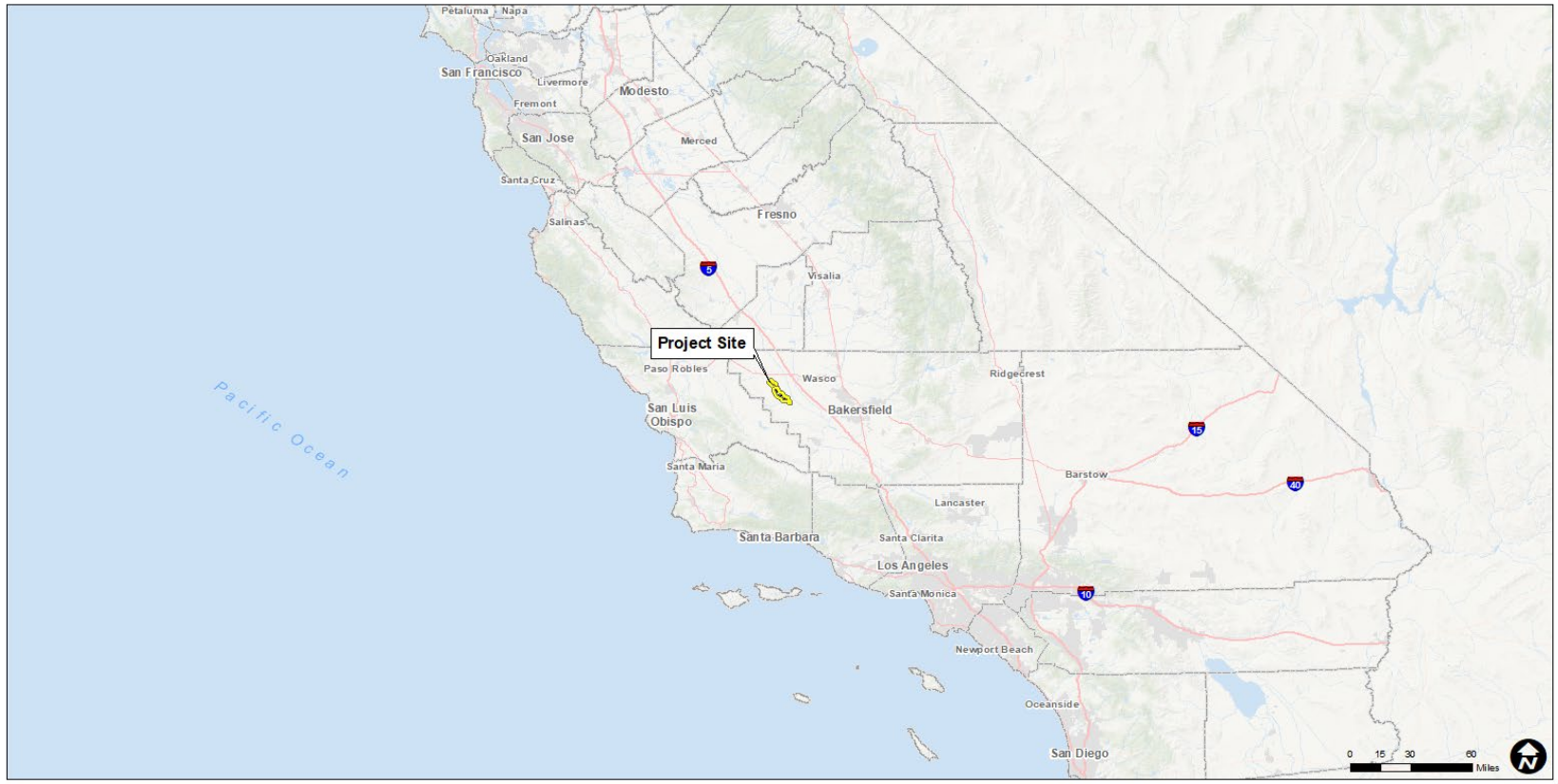


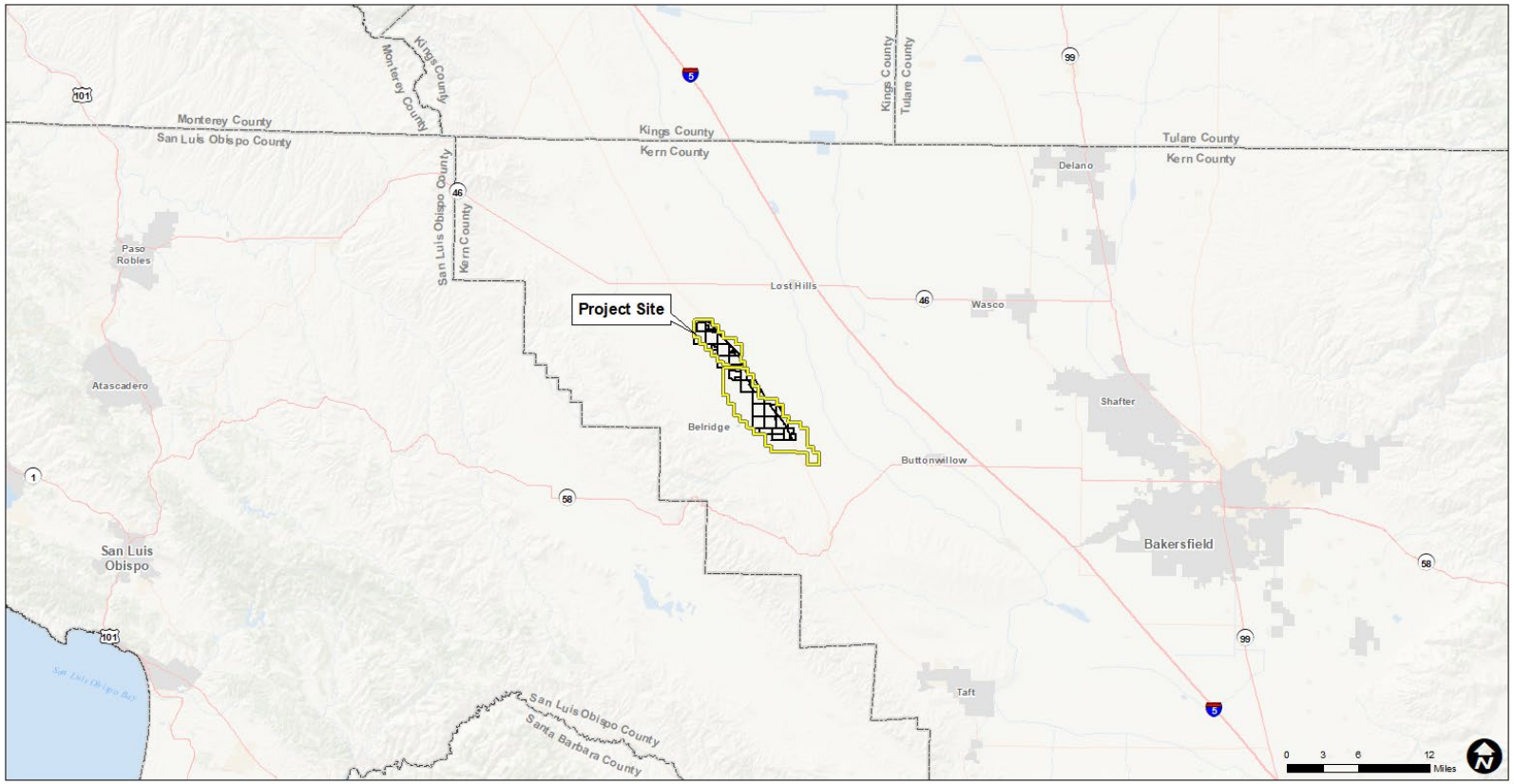
FIGURE 3-1
Regional Vicinity Map

CUP Boundary
Belridge Oilfields
County Boundary
City Limit
Highway

Draft Environmental Impact Report
Aera CarbonFrontier Project

Data Source: WSP 2024, Aera Energy 2023, CA Gov 2023

Figure 3-2: Project Location Map



3.1.1 Project Location

The project site is located within the Central Valley portion of unincorporated Kern County and is comprised of 45 parcels within the administrative boundaries of the Belridge oilfields. The project area is mapped in Figure 3-1: Regional Vicinity. The Belridge oilfields are contiguous and located west of State Route (SR) 33, approximately 7 miles southwest of the community of Lost Hills (population 2,370).

Together, the two Belridge oilfields cover an area of approximately 13 miles long and 3 miles wide. Aera Energy is the primary operator within both oilfields. The main entrance to the South Belridge oilfield is located at the private Oasis Road, a private road. Primary access to the project site would be from Oasis Road, accessed from Seventh Standard Road, west of SR 33, which can be seen in Figure 3-2: Project Location Map. The Belridge oilfields can also be accessed from a series of entrances along the west side of SR 33. These main access points connect to a network of existing dirt roads within the field. Existing roads would be maintained, and no new roads would be constructed as part of the project.

The project is contained within the following Sections of Belridge oilfields: 21, 22, 26, 27, 28, 34, 35, and 36 of Township 27 South, Range 20 East; Sections 1, 2, and 12 of Township 28 South, Range 20 East; Sections 6, 7, 17, 18, 20, 27, 28, 29, 32, 33, and 34 of Township 28 South Range 21 East; and Sections 2, 3, and 4 of Township 29 South, Range 21 East of the Mount Diablo Base and Meridian, County of Kern, State of California.

3.2 Proposed Project

3.2.1 County Discretionary Actions

The proposed project requires the following approvals from Kern County:

- Zone Classification Change: ZCC No. 4, Map No 51, ZCC No. 3, Map No. 74, and ZCC No. 4, Map No. 75 from A-1 (limited Agriculture) to A (Exclusive Agriculture) on approximately 1,738 acres and from A/NR (Natural Resources – 20-acre minimum) to A (Exclusive Agriculture) on approximately 46 acres.
- Conditional Use Permits: CUP No. 9, Map No. 51, CUP No. 7, Map No. 74, CUP No. 7, Map No. 75, CUP No. 9, Map No. 96, CUP No. 10, Map No. 51, CUP No. 9, Map No. 74, and CUP No. 11, Map No. 75 to permit the construction and operation of the CCS facility on approximately 12,362 acres with site installation of nine Class VI UIC injection wells, up to eight CO_2 monitoring wells, one downhole seismic monitoring station, and construction and operation of accessory infrastructure for CO_2 storage capacity of up to 40 MMT of CO_2 within the A (Exclusive Agriculture) Zone District.

The CUP public hearing process would consider all parts of the project implementation and standards, including compliance with the U.S. Environmental Protection Agency (EPA) Class VI

UIC mandate (as defined in Title 40 of the Code of Federal Regulations (CFR) (40 CFR 146.81)) of the consideration of a variety of measures to assure that injection activities would not endanger underground sources of drinking water (USDW). The concept of endangerment is defined in 40 CFR 144.12.

CCS has been determined under County Code Section 19.08.085 – Alternative to Determination of Similar Use, to be a storage operation and not a manufacturing operation, which can be processed for consideration through the CUP process (Section 19.102). Under this determination, made with the authority granted to the Planning Director in Section 19.06.020, storage of CO_2, in either existing formations or tanks for transport and disposal or use, is an allowed use with the processing and approval of a CUP in the following districts:

- A (Exclusive Agriculture) District (Resource Extraction and Energy Development Uses)
- M-2 (Medium Industrial) District (Resource Extraction and Energy Development Uses)
- M-3 (Heavy Industrial) District (Resource Extraction and Energy Development Uses)

As portions of the underground pore space required for storage has surface land that is currently zoned A-1 (Limited Agriculture) and A/NR (Natural Resources – 20-acre minimum), a zone change to A (Exclusive Agriculture) is required for consistency with the Kern County General Plan (KCGP) and conformance with this determination, as stated above. Two of the parcels – 068-200-41 (66.84 acres) and 068-220-39 (26.17 acres) are not owned by the applicant and authorization from these owners, to be included in this CCS project, is required.

Table 3-1, below, identifies the individual parcels, their respective assessor parcel numbers (APN), acreages, and existing general plan codes and zoning designations, along with proposed zoning for each parcel within the project area.

Table 3-1: Project APNs, General Plan Map Codes, Zoning, and Acreage

APN	Existing Map Code Designations	Existing Zoning	Proposed Zoning	Acres	Williamson Act Land Use Contract	Farmland Security Zone
068-200-16	8.4	A-1	A	40	-	-
068-200-30	8.4	A	A	44.8	-	-
068-200-33	8.3/8.4	A	A	192.34	WA	FSZ
068-200-37	8.4	A	A	37.23	-	-
068-200-41	8.4	A	A	66.84	-	-
068-210-18	8.3/8.4	A	A	360	-	-
068-220-01	8.4	A	A	640	-	-
068-220-08	8.4	A	A	80	-	-
068-220-13	8.4	A	A	640	-	-

Table 3-1: Project APNs, General Plan Map Codes, Zoning, and Acreage

APN	Existing Map Code Designations	Existing Zoning	Proposed Zoning	Acres	Williamson Act Land Use Contract	Farmland Security Zone
068-220-25	8.4	A-1	A	40	-	-
068-220-26	8.4	A	A	118.85	-	FSZ
068-220-36	8.4	A	A	324.1	-	-
068-220-37	8.4	A	A	18.52	-	-
068-220-39	8.4	A	A	26.17	-	-
068-220-42	8.4/8.1	A	A	123.6	-	-
068-220-44	8.4	A	A	78.29	-	-
068-220-55	8.4	A	A	152.36	-	-
068-230-04	8.3/8.4	A-1	A	640	-	-
085-110-10	8.4/2.5	A-1	A	554.84	-	-
085-110-13	8.4	A	A	160	-	-
085-110-14	8.4	A	A	160	-	-
085-110-16	8.4	A	A	80	-	-
085-110-32	8.4	A	A	382.33	-	-
085-110-50	8.4/2.5	A-1	A	462.54	-	-
085-190-27	8.1/8.4	A	A	64.77	-	-
085-190-28	8.1/8.4	A	A	309.82	-	-
085-210-18	8.4/2.5	A	A	619.15	-	-
085-210-40	8.1/2.5	A	A	135.3	-	-
085-210-42	8.1/2.5	A	A	313.16	-	FSZ
085-210-43	8.4/2.5	A	A	530.22	-	-
085-220-19	8.1/2.5	A	A	14.77	-	-
085-220-21	8.4/2.5	A	A	287.87	-	-
085-220-22	8.4/2.5	A	A	336.16	-	-
085-220-36	8.1/2.5	A	A	274.99	-	-
085-230-05	8.4	A	A	640	-	-
085-230-07	8.4/2.5	A	A	631.36	-	-
085-230-09	8.4/2.5	A/NR(20)	A	636.36	-	-
085-230-25	8.1/8.4	A	A	139.79	-	-
085-230-26	2.5/8.1/8.4	A	A	493.18	-	-
085-230-34	8.4	A	A	5	-	-
098-111-01	8.4	A	A	315.78	-	-
098-111-03	8.4/8.3	A	A	320	-	-

Table 3-1: Project APNs, General Plan Map Codes, Zoning, and Acreage

APN	Existing Map Code Designations	Existing Zoning	Proposed Zoning	Acres	Williamson Act Land Use Contract	Farmland Security Zone
098-112-01	8.4	A	A	277.07	-	-
098-112-02	8.4	A	A	276.98	-	-
098-120-10	8.4/8.3	A	A	317.04	-	-
Total Acreages				**12,361.58**		

Key
(-) Not Applicable

Kern County General Plan Map Code Designations:
2.5 (Flood Hazard Overlay)
8.1 (Intensive Agriculture)
8.3 (Extensive Agriculture)
8.4 (Mineral and Petroleum)

Kern County Zoning District:
A (Exclusive Agriculture); A-1 (Limited Agriculture); NR (20) (Natural Resource, Min 20 Acre Parcel Size)

Williamson Act Land Use Contract:
WA - Active

Farmland Security Zone:
FSZ - Active

3.2.2 Project Objectives

The following objectives have been provided by the applicant for the project:

- Construct and operate facilities and infrastructure to capture, transport, inject, and permanently store up to 40 MMT of CO_2 in a safe, secure, and economically feasible manner for storage, not enhanced recovery.
- Minimize new disturbance by siting and designing project facilities and infrastructure within the existing developed oilfield footprint, consistent with current Kern County and California guidelines.
- Reduce the carbon intensity of Aera Energy's produced oil and gas by capturing CO_2 from produced gas (pre-combustion) and stationary sources (post-combustion).

- Generate environmental, social, and economic benefits for Kern County and the State of California by implementing low carbon technologies, developing CCS infrastructure, and providing living-wage jobs in the region.
- Contribute to California's goal to achieve carbon neutrality by 2045 (Executive Order B-55-18) by integrating carbon capture in existing operations as well as ending oil and gas production from select reservoirs and repurposing them for the permanent storage of CO_2.

3.3 Environmental Setting

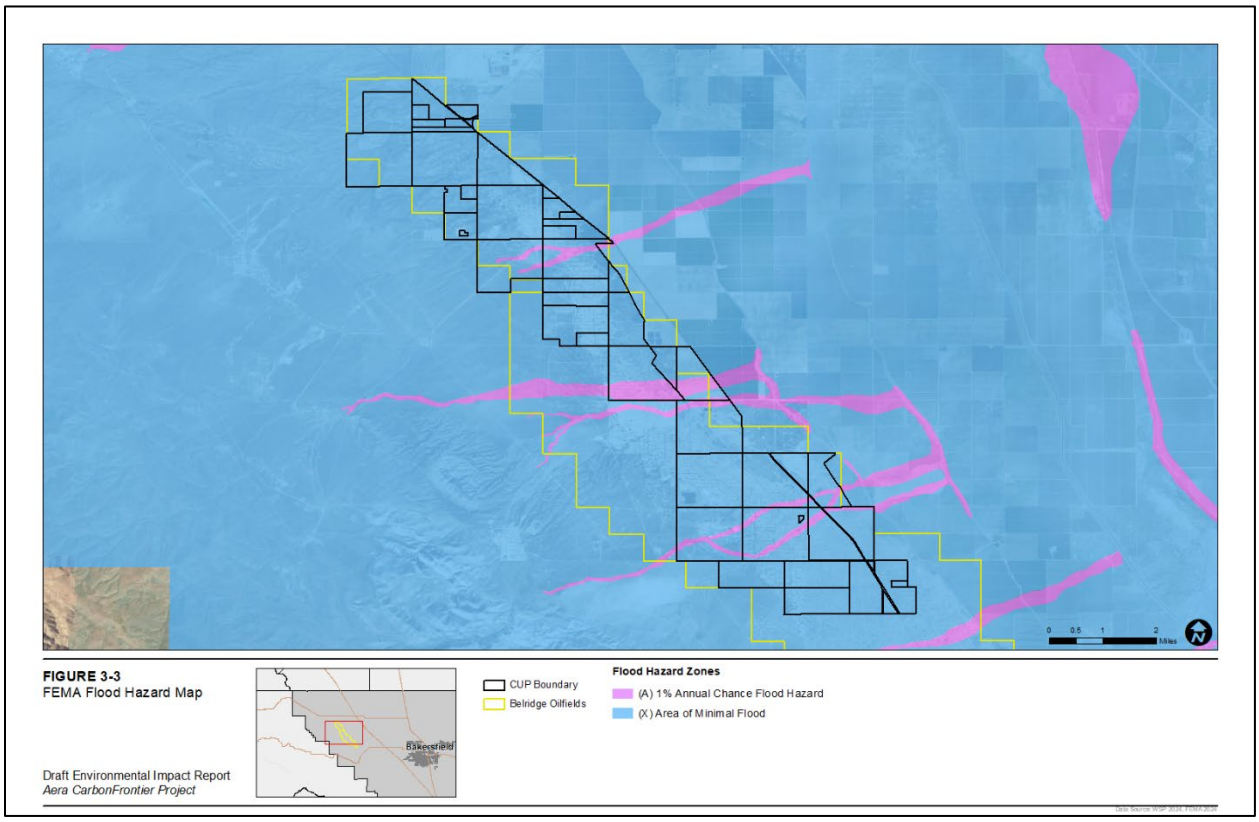
Regional Setting

The project area encompasses land located in the western extent of the valley region of the unincorporated area of Kern County, California. The County's geography includes, among other features, mountainous area, agricultural lands, and deserts. Kern County is California's third largest County in land area and encompasses 8,161 square miles with the current estimated population being 914,193 residents.

The project site is located within the unincorporated area of Kern County and within the administrative boundary of the Belridge oilfields. Combined, the two oilfields cover an area approximately 13 miles long and 3 miles wide (Figure 3-2: Project Location Map). The oilfields are predominantly developed with oil and gas production and accessory facilities and infrastructure. The primary operator within both oilfields is Aera Energy LLC. The proposed CO_2 capture facilities would be located within the developed portion of the South Belridge oilfield. The proposed injection wells, monitoring wells, and CO_2 Underground Storage Area would be located in the North Belridge oilfield. New aboveground facility pipelines would transect both oilfields.

The proposed project site is within the San Joaquin Valley Air Basin, under the regulatory authority of the San Joaquin Valley Air Pollution Control District. The Federal Emergency Management Agency (FEMA) delineates flood hazard areas on its Flood Insurance Rate Maps (FIRMs). A majority of the proposed project site is designated as Zone "X" on the FIRMs, which indicates the site is not in an area of flood hazard, as shown in Figure 3-3: FEMA Flood Hazard Map. However, portions of the proposed pipeline routes are located within the FIRMs and are designated as Zone "A" flood hazard area, which indicates the site has a 1 percent chance of flooding. There are no State-designated Alquist-Priolo Earthquake Fault Zones within the proposed project site. No portion of the project site is identified as a wetland area on the National Wetlands Inventory.

Figure 3-3: FEMA Flood Hazard Map



The nearest urbanized areas to the boundary of the CCS Surface Land Area and Underground Storage Area for the project are Bakersfield city center (approximately 36 miles), the City of Wasco (approximately 22 miles), the city of Taft (approximately 29 miles), and the unincorporated communities of Buttonwillow (approximately 17 miles), McKittrick (approximately 15 miles), and Lost Hills (approximately 7 miles).

The project site is crossed by several public utilities, including several Pacific Gas and Electric (PG&E) electric transmission line corridors.

On-site and Surrounding Land Use, General Plan and Zoning Designations

The project site is located within the Belridge oilfields on approximately 12,362 acres of privately owned land used for oil and gas exploration and production. Table 3-2 identifies the existing Land Use designations, Adopted General Plan Map Code Designations, and Existing Zoning for the project site and for areas north, south, east, and west of the project site.

Table 3-2: On-site and Surrounding Land Use, General Plan Map Code Designations, and Zoning

Location	Existing Land Use	Existing General Plan Map Code Designations	Existing Zoning
Project Site	Oil and Gas Exploration and Production	2.5 (Flood Hazard Overlay) 8.1 (Intensive Agriculture) 8.3 (Extensive Agriculture) 8.4 (Mineral and Petroleum)	A (Exclusive Agriculture) A-1 (Limited Agriculture) NR (20) (Natural Resource, Min 20 Acre Parcel Size)
North	Oil and Gas Exploration and Production, Undeveloped Private Land, Agriculture	8.3 (Extensive Agriculture)	A (Exclusive Agriculture)
East	Agriculture	2.5 (Flood Hazard Overlay) 8.1 (Intensive Agriculture)	A (Exclusive Agriculture)
South	Oil and Gas Exploration and Production	2.5 (Flood Hazard Overlay) 8.4 (Mineral and Petroleum)	A (Exclusive Agriculture)
West	Oil and Gas Exploration and Production, Undeveloped Land	2.5 (Flood Hazard Overlay)8.3 (Extensive Agriculture)	A (Exclusive Agriculture) A-1 (Limited Agriculture)

Refer to Figure 3.4: Williamson Act and FSZ Contracts, Figure 3.5: General Plan Land Use Map, and Figure 3.6: Zoning Map.

Figure 3-4: Williamson Act and FSZ Contracts

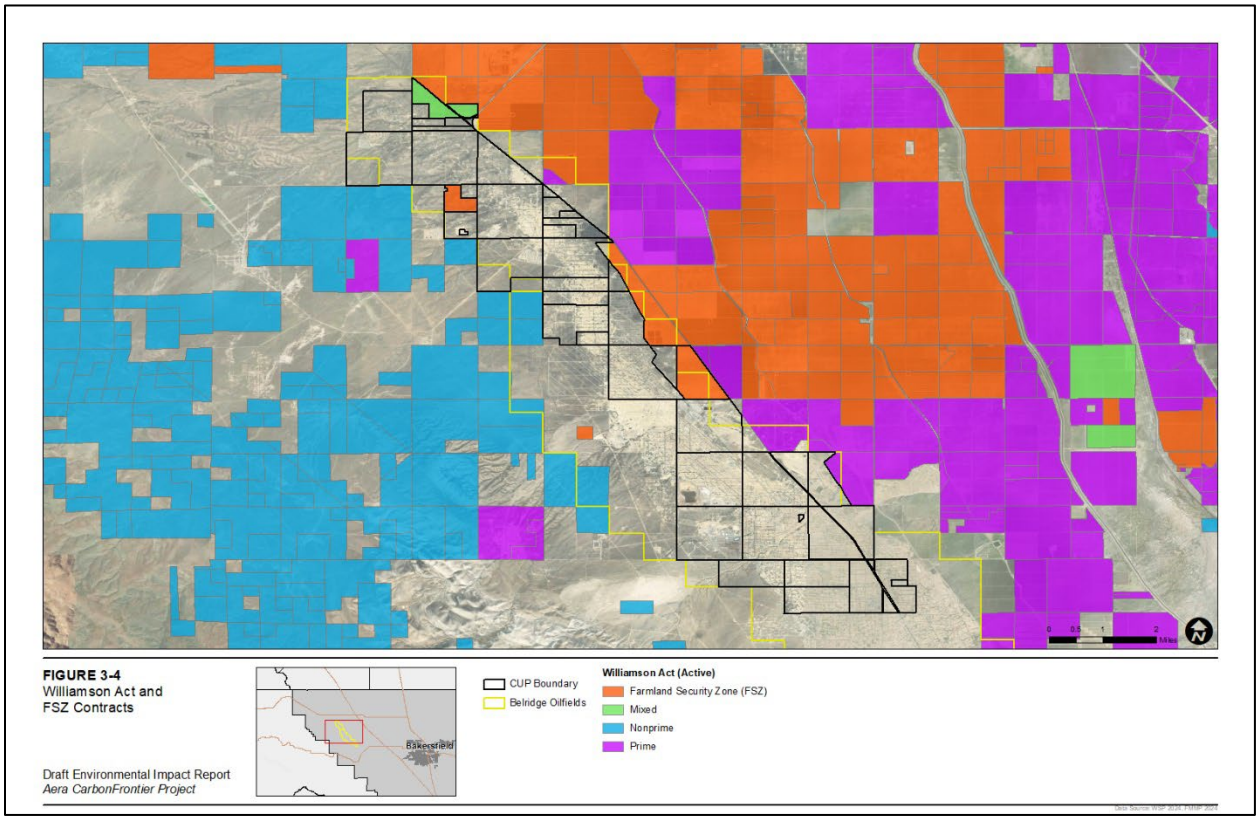


Figure 3-5: General Plan Land Use Map

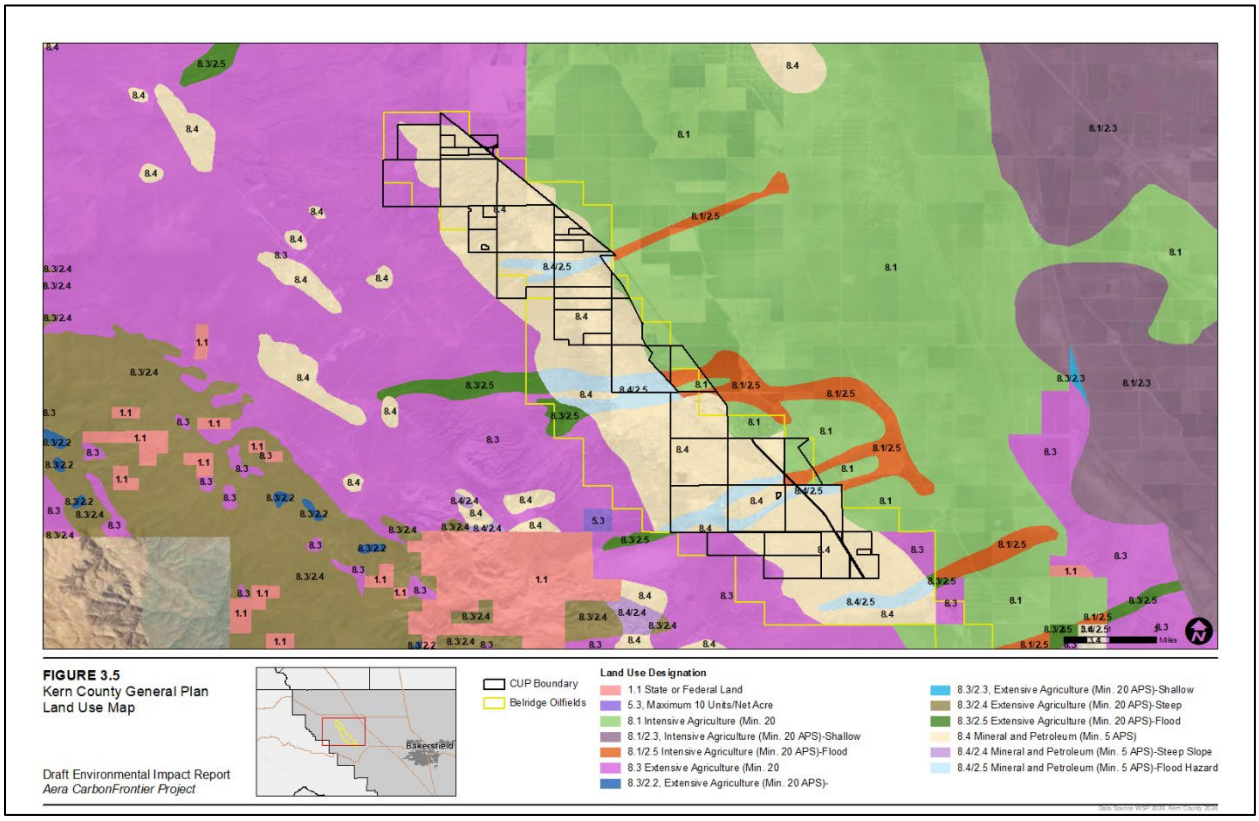
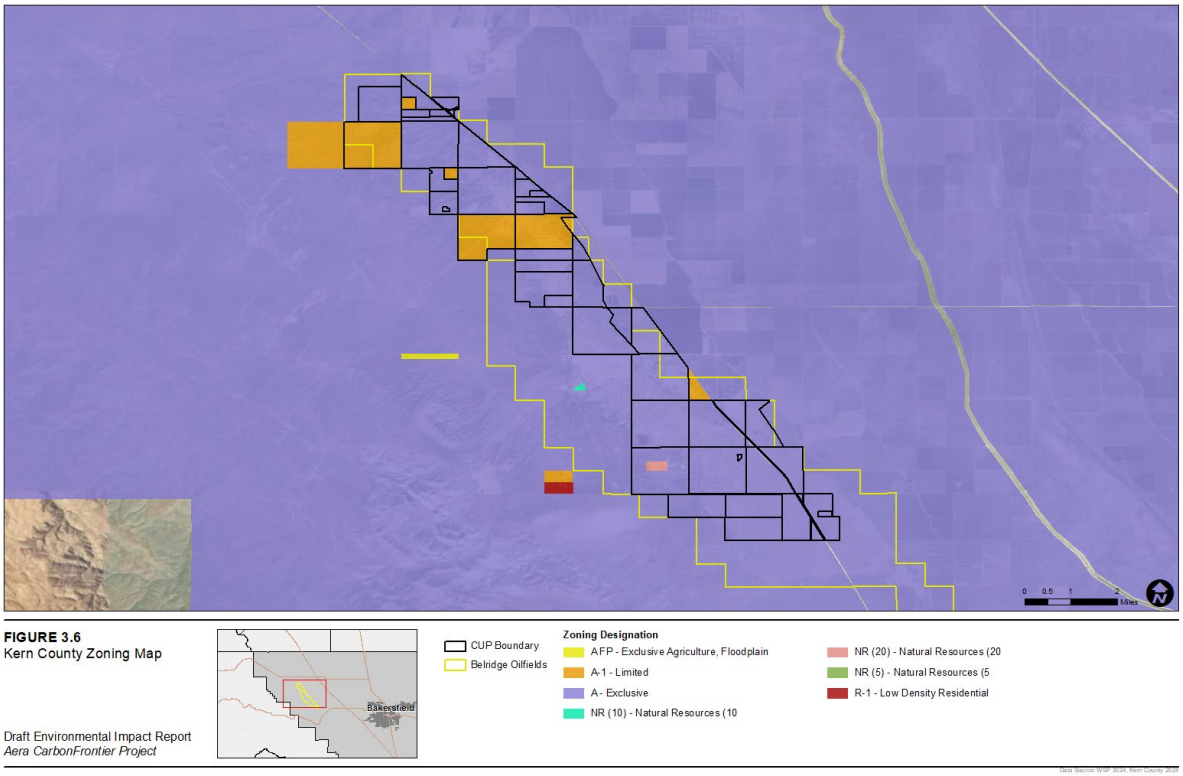


Figure 3-6: Zoning Map



Existing land use in the vicinity of the project site generally includes oil and gas exploration and production, grazing, and agricultural lands. The closest property to the proposed project site is a small housing tract on Lost Hills Road, north of Lerdo Highway, roughly 3 miles east of the proposed project site. The community of Lost Hills is located 7 miles northeast of the proposed project site. Lost Hills Wonderful Park, a local park, is located approximately 7 miles northeast of the nearest injection well. Schools near the project site are listed in Table 3-3. See Section 4.11 *Land Use and Planning,* for mapping and additional information.

Table 3-3: Schools near the Project Site

School Name	Student Population (2022-2023)	District	Distance to CUP Boundary (miles)	Distance to Closest Injection Well (miles)	Distance to Closest Facility Pipeline (miles)
Lost Hills Elementary School	180	Lost Hills Union Elementary	6.43	7.09	7.02
A.M. Thomas Middle School	82	Lost Hills Union Elementary	6.49	7.15	7.08
Wonderful College Prep Academy - Lost Hills	504	Kern County Office of Education	7.12	7.68	7.54
McKittrick Elementary School	79	McKittrick Elementary	8.68	17.30	11.41
Buttonwillow Elementary School	313	Buttonwillow Union Elementary	11.58	19.11	14.01

Key: CUP = Conditional Use Permit

The nearest public airport to the CUP boundary is the Buttonwillow-Elk Hills Airport located approximately 14 miles southeast from the project site. The proposed project is not located within an Airport Sphere of Influence, per the Kern County Airport Land Use Compatibility Plan.

Historical Site Use

The project is located within the Belridge oilfields. A summary of the historical operations within each oilfield is presented below.

South Belridge. The Belridge Oil Company discovered the oilfield in 1911 and retained control of operations until Shell purchased the production rights in 1979. A total of six oil zones have been found at the oilfield, consisting of the Tulare, Etchegoin, Diatomite, Antelope Shale, McDonald, and Devilwater-Gould. Most production within the South Belridge oilfield occurs from the Tulare and the Diatomite zones. Oil from the Tulare Formation is heavy crude, with a specific gravity of 10-13 degrees using the American Petroleum Institute (API) method, while oil from the Diatomite is classified as medium crude, with a specific gravity of 25-30 degrees API (Division of Oil, Gas, and Geothermal Resources (DOGGR), 1998).

North Belridge. The North Belridge oilfield was discovered in 1912 with the drilling of the Mannell-Minor Petroleum Company's "M.M. No. 1" oil well into a "fractured shale" zone. Initial

production records are incomplete, but oil production in 1915 was reported to be 10 barrels (bbls) of oil per day. Several designated production zones have been identified within the North Belridge oilfield, consisting of (from shallower to deeper) Tulare-Etchegoin, Diatomite, Temblor Sand, Carneros, Agua Sands, the 64 Zone Sands, and the Oceanic Sands. Production from the oilfield ranges from heavy to light crude ranges (13 to 40 degrees API) (DOGGR, 1998). Belridge Oil Company operated the field prior to 1979, when Shell acquired the majority of the properties within the oilfield.

Steaming operations of the Tulare zone were initiated in 1963 and ushered in new life for the field. This began as the "huff and puff" cyclic steaming procedure and has transitioned to continuous steam injection into designated wells with production from surrounding wells. Steam injection has continued to the present, with about 80,000 bbls of steam per day being injected into the Tulare formation.

Starting in 1977, hydraulic fracturing was employed on the Diatomite formation to great success. Due to the thickness of the formation, wells became more closely spaced with multiple completion intervals (wells capable of producing oil from several separate geologic strata). Characteristics of the Diatomite formation include high porosity and poor rock strength (easily compacted); this led to the implementation of waterflooding to mitigate the resulting land subsidence. More recently, steam injection has been used to assist in the viscosity reduction and displacement of oil, as well as to replace produced fluids and mitigate subsidence. Both processes continue to the present with about 400,000 bbls of water per day being injected along with 100,000 bbls of steam per day.

In 1997, Shell and Mobil combined their California exploration and production operations to form Aera Energy. Aera Energy has operated both oilfields for the last 27 years. In April 2023, the Canada Pension Plan Investment Board partnered with IKAV, an international asset management group, to acquire Aera Energy LLC.

Aera Energy, LLC Merger with California Resources Corporation

The applicant for the CarbonFrontier CCS Project is Aera Energy, LLC. On February 7, 2024, California Resources Corporation (CRC) announced the signing of a definitive merger agreement with Aera Energy, LLC. CRC is the applicant for the Carbon TerraVault 1 (Kern County) CCS Project in the Elk Hills oilfield, which is approximately 9 miles southeast from the CarbonFrontier CCS Surface Land use boundary, also in unincorporated Kern County. The Carbon TerraVault 1 (Kern County) CCS Project is in process of consideration for various land use permits, EPA permits, and a Draft Recirculated EIR (SCH # 2022030180) Carbon TerraVault I (Kern County) CCS Project by California Resources Corporation - Kern County Planning & Natural Resources Department. Both projects are being processed separately, have no shared facilities and are not dependent on the other for operations. They are both included in the respective cumulative impact list in each individual EIR. Common ownership of the projects, if the merger is finalized, is not sufficient evidence under the California Environmental Quality Act (CEQA) for a determination the projects are connected. There is no evidence or permitting on record that changes either project based on the announced tentative merger.

Mineral Use Zones and Mineral Recovery Areas

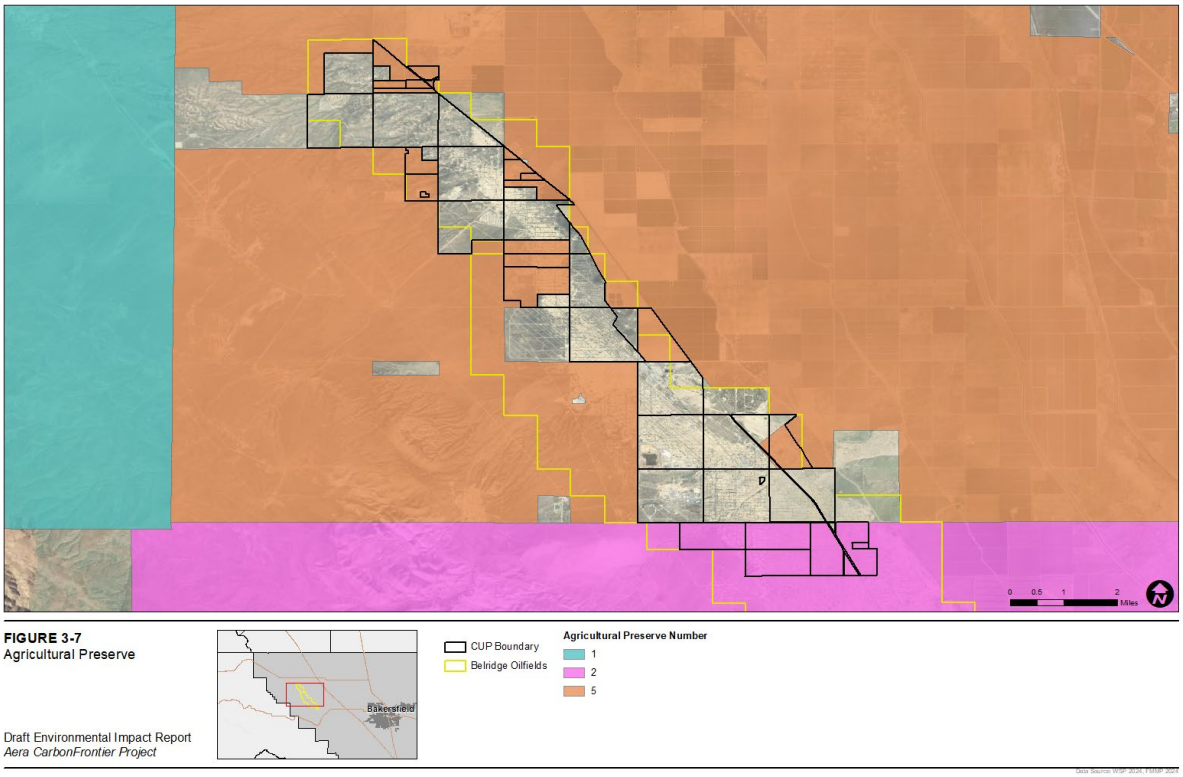
The project site is within an oilfield designated by the State of California and the KCGP for Mineral and Petroleum resource exploration and extraction. Oil and gas exploration and extraction are permitted uses in the A (Exclusive Agriculture) and A-1 (Limited Agriculture) zones. See Section 4.12, *Mineral Resources*, for mapping and additional information.

The Surface Mining and Reclamation Act of 1975 (SMARA) requires the State Geologist to classify land into Mineral Resource Zones (MRZs) according to its known or inferred mineral potential. According to the Updated Mineral Land Classification Map for Portland Cement Concrete-Grade Aggregate in the Bakersfield Production-Consumption Region, Kern County, California (CGS 2009), the project area is designated MRZ-3, containing known or inferred mineral occurrences of undetermined mineral resource significance. No locally important mineral resource recovery sites are delineated in the KCGP; however, several parcels within the project area are designated as "mineral and petroleum" land use (see Figure 3-5: General Plan Land Use Map). Most parcels within the proposed project site have a zone classification of A (Exclusive Agriculture), with the exception of five parcels which have a zone classification of A-1 (Limited Agriculture) and one parcel which currently has a zone classification of A/NR (20) (Natural Resources – 20-acre minimum). The project proponent has requested a zone change to A (Exclusive Agriculture) on parcels with a current zone classification of A-1 (Limited Agriculture) or NR (20) (Natural Resources – 20-acre minimum).

Farmland

The project site does not contain any land designated by the California Department of Conservation (DOC) as Prime Farmland, Farmland of Statewide Importance, or Unique Farmland. However, the proposed project site has two parcels (APN: 068-220-26, and 085-210-42) and a portion of one parcel (APN: 068-200-33) subject to Farmland Security Zone (FSZ) Contracts and one parcel (APN: 068-200-33) subject to Williamson Act Land Use Contracts, as shown in Figure 3-4: Assessor's Map and Williamson Act Contract Parcels. Furthermore, 22 parcels within the CUP boundary are included within the boundaries of an Agriculture Preserve: five of which included within the boundaries of Agriculture Preserve Number 2, and 17 within the boundaries of Agriculture Preserve Number 5, as shown in Figure 3-7: Agricultural Preserve and listed in Table 3-1. See Section 4.2, *Agricultural Resources,* for additional information.

Figure 3-7: Agricultural Preserve



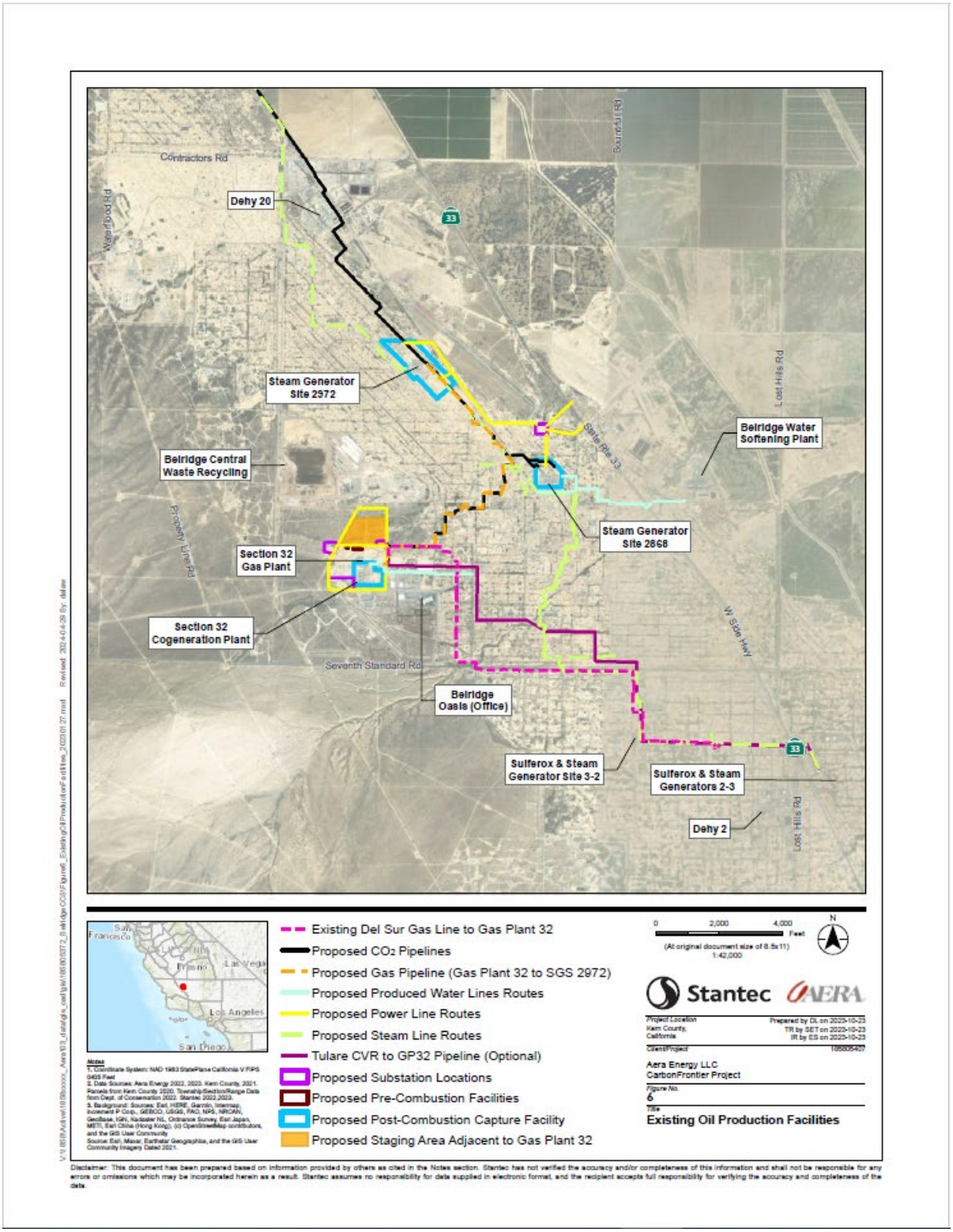
Existing On-Site Conditions

After over 100 years of operations by a variety of upstream companies, the base business of Belridge is the production of hydrocarbon reserves from the Tulare, Diatomite, and deeper horizons. Current operations are supported by the following processes, explained in more detail below:

- Construction and operation of wells used to produce oil and gas as well as for injection and monitoring activities that support oil and gas production
- Pipelines for the transport and distribution of oil, gas, water, and steam within the oilfield
- Facilities and ancillary infrastructure, including the following:
    - Oil dehydration, in preparation for sales, at Dehydration Facility (DEHY) 20 and DEHY 2
    - Water treatment to achieve injection-quality water at DEHY 20
    - Steam generation to support EOR processes in both the Tulare and Diatomite reservoirs, at several sites including Steam Generator Setting (SGS) 2972, 2868, 2-3, and 3-2, and the Co-Generation Plant 32 (COGEN 32)
    - Water treatment to achieve water for use in steam generation at Belridge Water Softening Plant (BWSP)
    - Electrical generation at the COGEN 32 to provide power for the transport of fluids from the producing horizons to treatment facilities
    - Sulfur-removal at Sulferox (SOX) Plant 32, SOX 3-2, and SOX 2-3 to reduce the generation of sulfur dioxide at the steam generation facilities
    - A gas conditioning facility at Gas Plant 32 (GP 32), to remove some water and heavier hydrocarbons from the Diatomite produced gas stream prior to its use as fuel
    - Gas compression at four Compressor Stations to move Diatomite gas to SOX 32/GP 32

Refer to Figure 3-8 for the locations of existing oil production facilities in the Belridge oilfields.

Figure 3-8: Existing Oil Production Facilities in South and North Belridge Oilfields (Source: Applicant Project Description)



Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

Oil Dehydration

Oil is prepared for market at a dehydration facility by removing other constituents, mainly gas and water, from the production stream. At both DEHY 2 and DEHY 20, Free Water Knockouts are used to both de-gas the stream and, by gravity separation, remove the water. The recovered oil, which has less than 3 percent water, is then sold via pipeline for refining into marketable products.

Water Treatment

Water treatment consists of removing any residual oil and formation fines from the produced water stream, in preparation for either direct injection (e.g., Diatomite Water Flood) or further treatment for steam generation. Water treating often occurs at a dehydration facility and includes floatation cells and filters. Water is softened (removal of hardness ions) for subsequent steam generation processes using ion-exchange methods.

Steam Generation

Steam is produced and injected to aid in the production of both Tulare and Diatomite oil. The steam generated for Tulare injection is produced "wet"; it is made at approximately 70 percent quality, by mass, and the entire stream, vaporized and liquid fractions, is injected into the well. Diatomite steam is generally injected as a "dry" product; the liquid fraction of the stream is separated and only the vaporized fraction is injected into wells. The main steam generating locations for the Tulare reservoir are SGS 3-2 and SGS 2-3. Those sites designated for Diatomite are SGS 2972, SGS 3363, and SGS 2868.

Co-Generation Plant 32

Co-Generation Plant 32 (COGEN 32) was constructed from 1985 to 1986 to satisfy the electrical power needs of the South Belridge oilfield. COGEN 32 is composed of three turbine-driven generator sets, each able to make 20 megawatts of power. COGEN 32's output is backed up with a connection to PG&E; if the oilfield requires more power than the COGEN 32 can produce or when COGEN 32 is down for maintenance, the balance is imported from PG&E.

Since the exhaust from turbines has a considerable amount of unrecovered energy, COGEN 32 also has a steam production component. The excess turbine heat is recovered by turning soft water into approximately 65 percent quality, by mass, steam for use in the Tulare production process. By so doing, over 75 percent of the input energy is converted into a useable form, either as electrical power or steam.

Sulferox Plants 32, 3-2, 2-3

Gas produced from the Diatomite and Tulare reservoirs is used in the production of steam. Both gas streams have significant levels of hydrogen sulfide (H_2S) which, when burned, creates sulfur dioxide. The function of the Sulferox (SOX) Plants is to recover H_2S from the gases and convert it to solid sulfur. SOX 32 is the facility that achieves that function for Diatomite gas; SOX Plants 3-2 and 2-3 perform that service for the Tulare gas. Those Tulare plants occupy sites with the

adjoining steam generation facilities. SOX 32 is adjacent to the other Diatomite gas treating facility, GP 32.

Gas Plant 32

After the sulfur in the Diatomite gas has been reduced at SOX 32, the remaining gas is transported to GP 32. At GP 32, the gas is further conditioned to reduce the water content and moderately reduce the content of heavier hydrocarbons (C_5+). GP 32's residue gas stream is utilized for steam generation.

Field Compression

The Belridge oilfields cover an area of about 13 miles long and 3 miles wide. Gas is produced along with fluids throughout that area. Diatomite gas is transported via pipeline to SOX 32, then GP 32, and propelled by local compressor stations. Those stations collect the gas at low pressure from field separators and increase the pressure to move it to the treating facilities. SOX 32 reduces the sulfur content to < 16 parts per million (ppm) and GP 32 conditions the gas for dewpoint control before sending it to nearby steam generators to be consumed (combusted). There are four primary Diatomite stations: Compressor Stations 26, 49, 50, and Del Sur.

Similarly, the Tulare produced gas is gathered from the producer's wellheads and directed, via local compressors, to the SOX 3-2 and SOX 2-3 treating plants. Those plants remove 90 percent or more of the stream's H_2S before directing it to nearby steam generators to be co-fired with other natural gas. The compressors for the Tulare produced gas are at Casing Vapor Recovery (CVR) 3-1, Marina, CVR 12-2, CVR 2-3, and the DEHY 2 Tank Vapor Recovery.

Well Drilling and Completion

Aera Energy routinely drills wells for production and injection in the Belridge oilfields to replace existing wells and develop new areas. Between 2012 and 2015, when activity levels were high, Aera Energy drilled roughly 750 wells per year on average in the Belridge oilfields; approximately 90 percent of those wells were in South Belridge. From 2016 to 2019, approximately 350 wells per year were drilled in Belridge oilfields, again most of the drilling activity occurred in the South Belridge oilfield. In recent years, impacts from COVID-19 and permitting constraints led to historically low drilling activity. Only 94, 12, and 88 wells were drilled within the Belridge oilfields during 2020, 2021, and 2022, respectively. Nearly 64,000 barrels of oil equivalent per day are produced from wells in the Belridge oilfields.

Well Plugging

Aera Energy complies with the California Geologic Energy Management Division (CalGEM, formerly DOGGR) requirements for oil well abandonment. CalGEM determines the requirements and supervises oil well plugging and abandonment, outlined in California Public Resources Code § 3008. General well abandonment procedures include isolating all oil-bearing strata encountered in the well, plugging the well, and decommissioning the attendant production facilities of the well.

Aera Energy has 2,449 idle wells and 24,830 plugged/abandoned wells across the Belridge oilfields as of March 2023.

Public Services

The project site is served by the Kern County Sheriff's Office for law enforcement and public safety services, with the closest substation being the North Area Substation, located 13 miles southeast of the project site at 181 East First Street. Fire protection and emergency medical services are provided by the Kern County Fire Department, with the closest station being the Lost Hills Fire Station and Kern County Emergency Medical Service for medical care and emergency services, located 7 miles northeast of the project site at 14670 Lost Hills Road in the community of Lost Hills. The same providers would serve the proposed project.

Site Access

The main entrance to the South Belridge oilfield is located at Oasis Road, a private road. Primary access to the project site would also be from Oasis Road, accessed from Seventh Standard Road, west of SR 33. The Belridge oilfields can also be accessed from a series of entrances along the west side of SR33. These access points connect to a network of existing dirt roads within the oilfield. Existing roads would be maintained, and no new roads would be constructed as part of the project.

3.4 Proposed Project Characteristics

The following section provides a discussion regarding each of the project components. The proposed project includes the construction of four CO_2 capture facilities for the initial source construction of facility pipelines to convey CO_2 from the capture facilities to the proposed Underground Storage Area, and constructing or repurposing up to nine injection wells within North Belridge. The proposed project also includes construction of monitoring wells, new field systems, and utility connections and delivery lines. Construction and operation of the project components described in this section are discussed in Section 3-5 *Construction* and Section 3-6 *Operational and Maintenance Activities*. Refer to Figure 3-9 for the location of the proposed CO_2 capture facilities. Project elements are shown on Figures 3-10 through 3-11 – Site Plan, and include: capture facilities, pipelines, and injection and monitoring wells, described in detail in the following sections.

Figure 3-9: Proposed CO_2 Capture Facilities

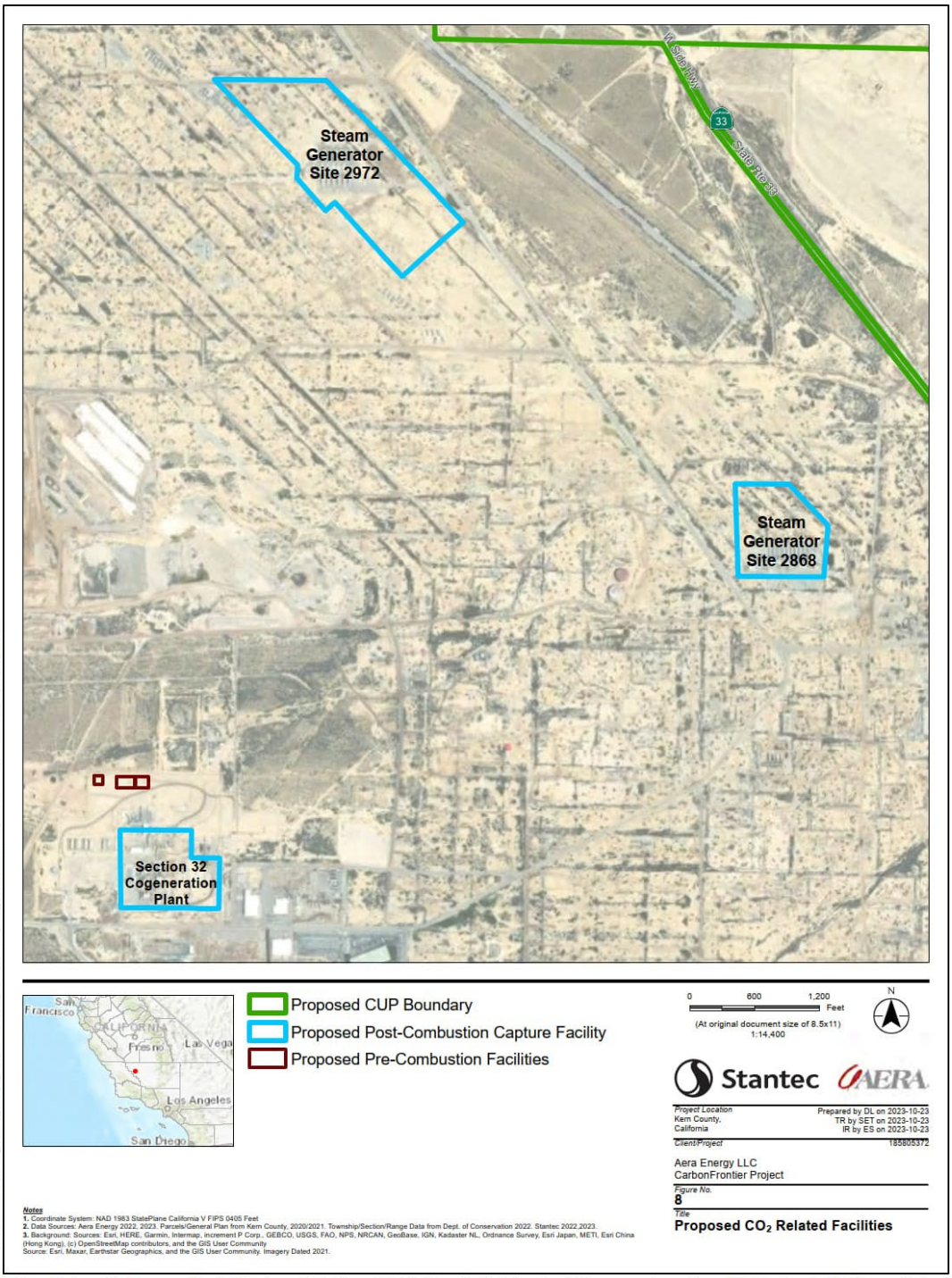


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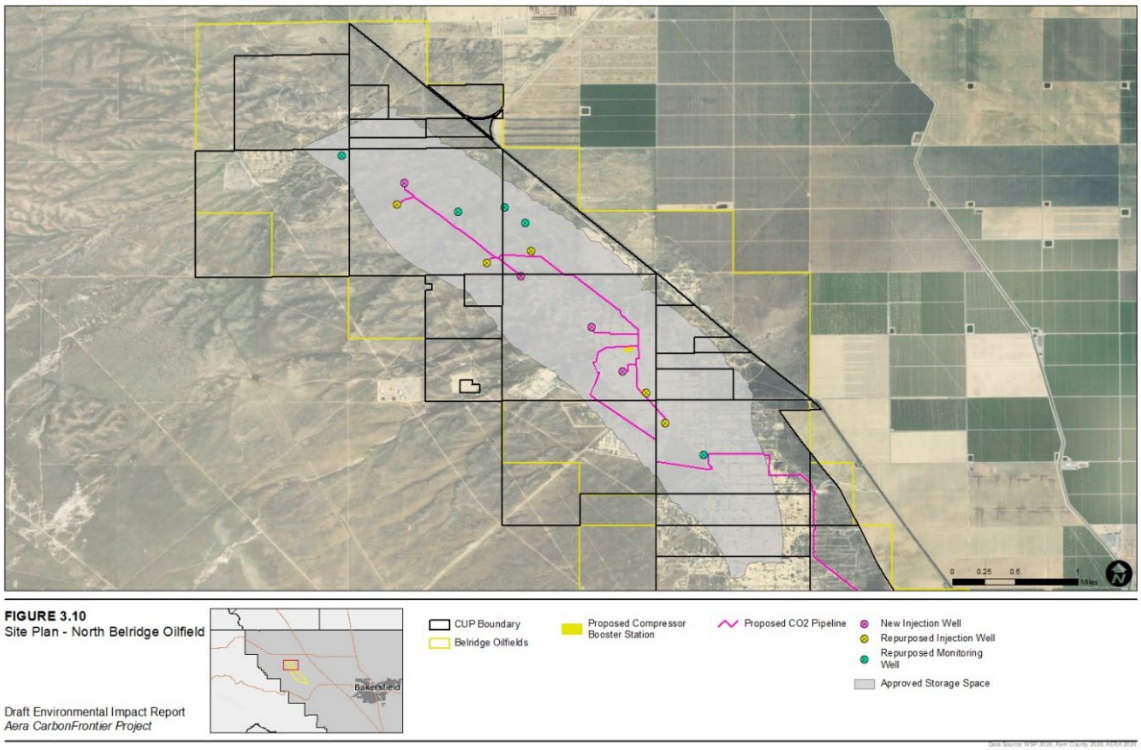
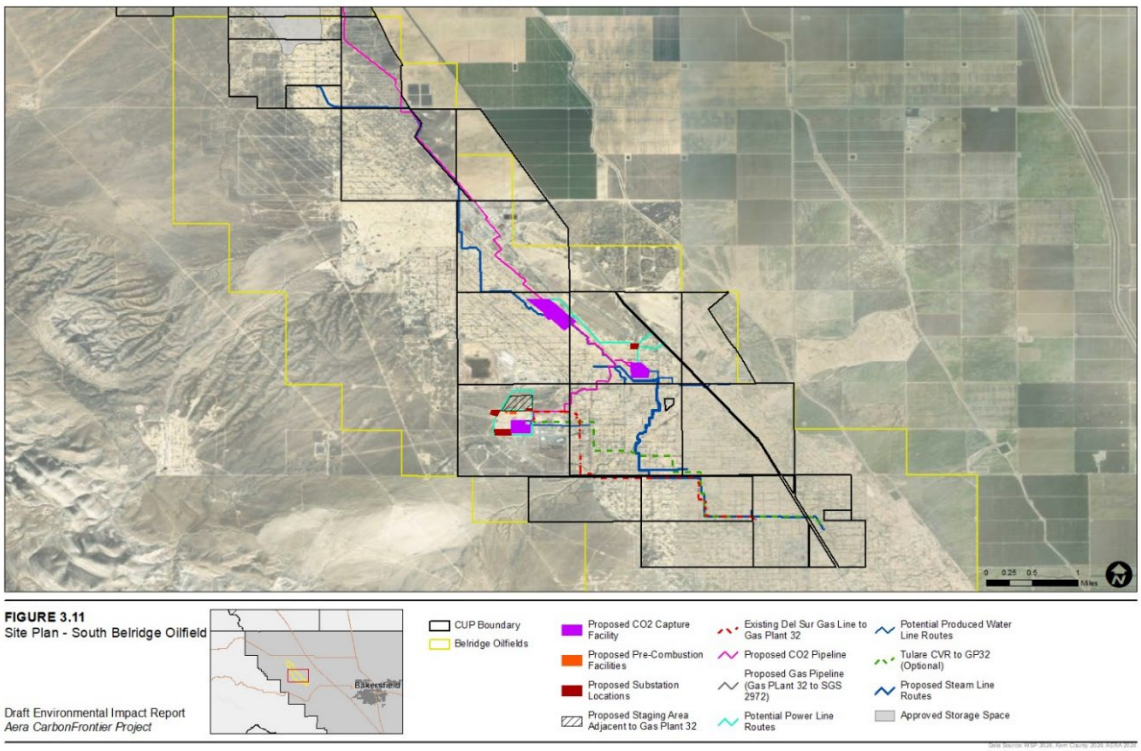
Figure 3-10: : Site Plan Figures (Source: WSP)

Figure 3-11: Site Plan Figures (Source: WSP)





3.4.1 CO_2 Capture Sites

Source of CO_2 and Capture Facilities

The initial source of CO_2 for injection as part of this project includes pre-combustion (Pre-C) produced gas stream and post-combustion (Post-C) flue gas. Proposed CO_2 capture facilities include the separation, dehydration, compression, and cooling of CO_2 from one facility for pre-combustion (Pre-C) produced gas stream and from three facilities for post-combustion (Post-C) flue gas. A general discussion of each facility is presented below.

Pre-Combustion (GP 32)

The Pre-C carbon capture facility would treat produced gas from the Diatomite and Tulare formations. Gas produced from the Tulare Formation is not currently processed at Gas Plant 32. To capture CO_2 from this gas stream, a combination of new and existing pipelines would be used to deliver the Tulare gas stream to the Pre-C capture facility located at GP 32. Two transport alternatives are described below.

Del Sur to GP32 Pipeline. Gas produced from the Tulare formation via existing oil wells within South Belridge oilfield would be transported via an existing 16 inch in diameter, 3.3-mile pipeline operating at approximately 150 pounds per square inch gauge (psig). It is known as the Wet Gas Del Sur pipeline to GP 32. The Tulare Associated gas stream would need to go through the Del Sul Compressor Station to increase pressure before being transported to GP 32, which would require a "jumper" line to be constructed. The new jumper line would be approximately 200 feet long. One existing idle compressor at the Del Sur Compressor Station would be put back to service to accommodate the Tulare gas. The Del Sur compressors would also be upgraded with new materials/trim for corrosion resistance.

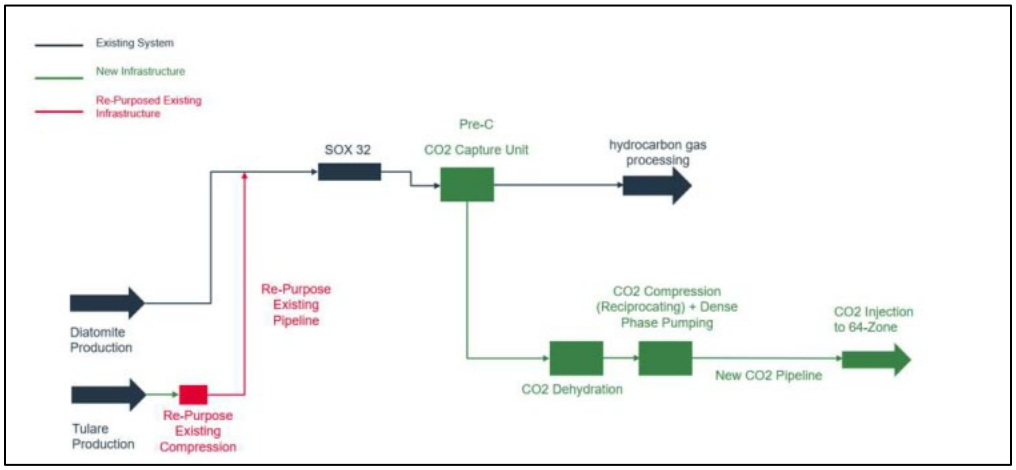
Tulare CVR to GP 32 Pipeline. Alternatively, Pre-C gas produced from the Tulare Formation via existing oil wells within South Belridge would be transported via a new 12 to 16 inch in diameter, 3.8-mile-long pipeline constructed primarily aboveground from the SOX 2-3 facility east of SR 33 to the SOX 3-2 facility, then to GP 32. The proposed pipeline would be installed aboveground on pipe supports over most of its length. The pipeline would cross SR 33 and Seventh Standard Road belowground using horizontal boring techniques. Alternatively, the produced gas may be commingled in existing gas pipelines along the pipeline route. New electrically driven compressors may be required to transport the gas, and the compressors and pipeline(s) would operate at up to 250 psig.

GP 32. The Tulare Associated gas stream would first be treated to remove sulfur through one of two alternative methods: 1) treatment at the existing SOX Plants 3-2 and 2-3 or 2) the gas would be treated at the existing SOX Plant within the GP 32. CO_2 would be removed from the combined produced gas stream (Tulare and Diatomite production) using a physical solvent or traditional amine absorption process or similar process. The facility would include three steel towers of varying height, but none taller than 120 feet in height and between 2 to 12 feet in diameter. Supporting this facility would be several heat exchangers, transfer pumps, compressors, and storage

area for make-up chemicals. Additionally, a roughly 2-mile aboveground gas pipeline between GP 32 and SGS 2972 has been included in the project to consolidate produced gas use at the SGS 2972 and SGS 2868 steam generation facilities. The pipeline would be between 10 to 12 inch in diameter.

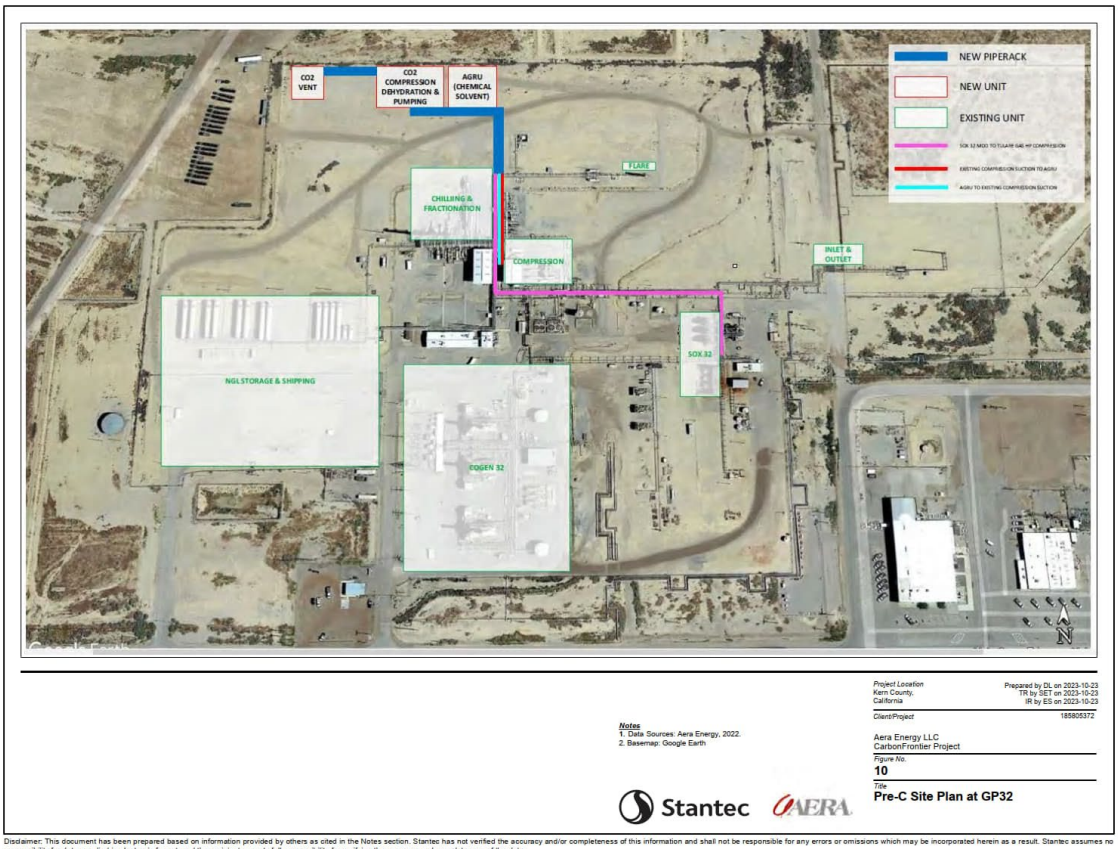
Pre-C Facility and Capture Technology. In the Pre-C CO_2 capture and processing facility, the produced gas would be cooled, then passed through an absorber column where an absorbent chemically reacts with and binds about 90 percent of the CO_2. The rich absorbent carrying CO_2 is piped to the regenerator column, where through the application of heat, the CO_2 would be released and captured in relatively pure concentration. The CO_2 would then be compressed, dehydrated, removed of oxygen, and piped to the CCS site. Following CO_2 separation, the lean absorbent would be recycled back to the absorber column. The remaining produced gas would then be transferred to the steam generation facilities for use as fuel. A 2.3-mile aboveground gas pipeline between GP 32 and SGS 2972 has been included in the project to consolidate produced gas use at the SGS 2972 and SGS 2868 capture steam generation facilities. The pipeline would be between 10 to 12 inch in diameter. Figure 3-12 below partly illustrates the Pre-C removal process.

Figure 3-12: Pre-C Removal Process (Source: Applicant Project Description)



The Pre-C process would use the existing facility infrastructure of GP 32. The figure above also indicates what is part of the existing system and what would be new. For example, the CO_2 infrastructure is new. Figure 3-13 – Pre-C Facilities Site Plan shows the CO_2 processing facility, denoting existing infrastructure and proposed infrastructure.

Figure 3-13: Pre-C Facilities Site Plan (Source: Applicant Project Description)



Post-Combustion

Proposed CO_2 capture and processing facilities include the separation, dehydration, compression, and cooling of CO_2 from flue gas emissions from existing stationary sources within South Belridge. A Post-C capture facility would be constructed at each of the three existing facilities: Cogen 32, SGS 2972, and SGS 2868. The flue gas emissions from each Post-C source would be ducted to its own CO_2 capture and processing facility. Figure 3-14, Figure 3-15, and Figure 3-16 shows the Post-C site plan for Cogen 32, SGS 2972, and SGS 2868.

Figure 3-14: Post-C Site Plan at Cogen 32 (Source: Applicant Project Description)

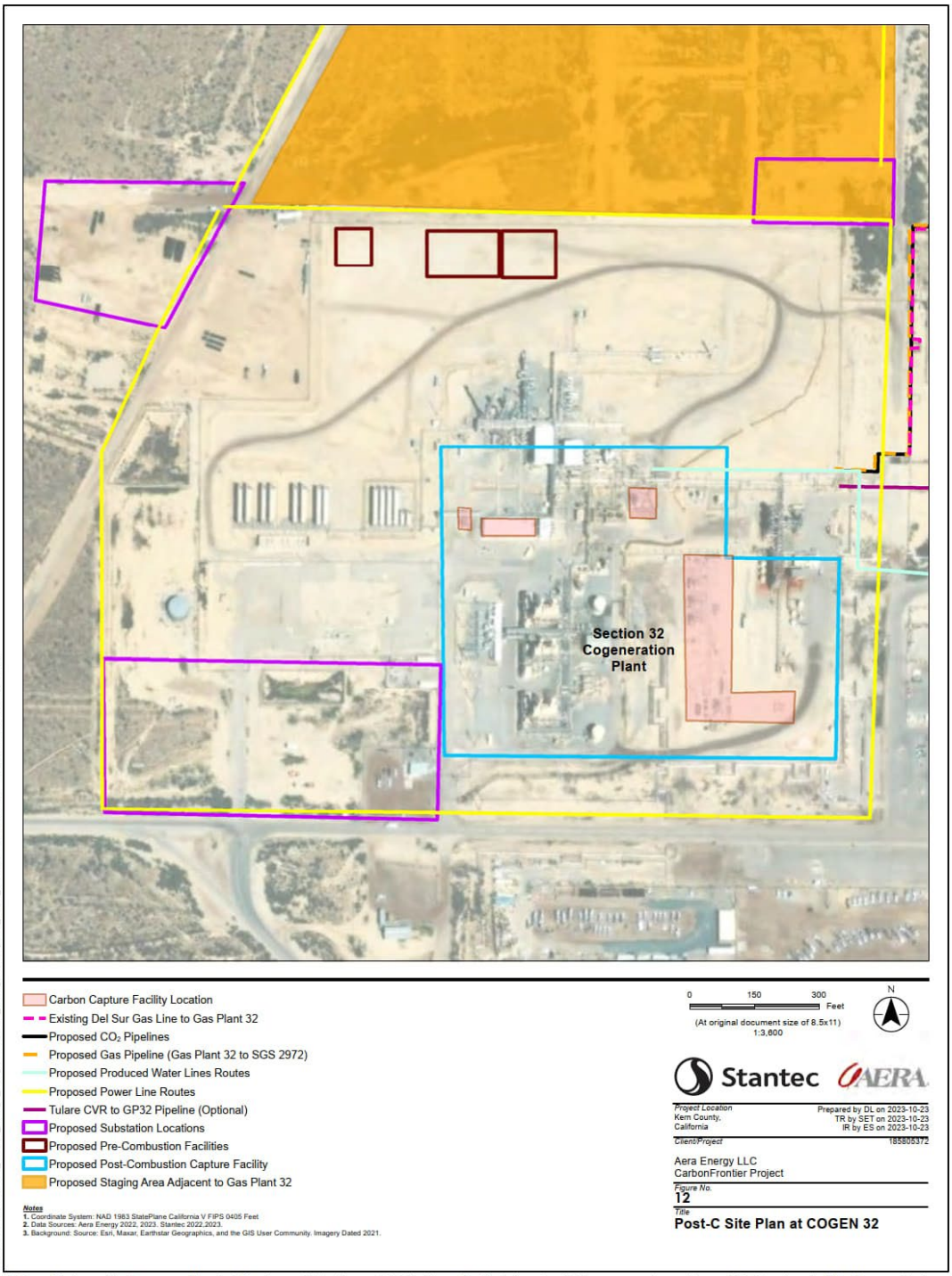


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Figure 3-15: Post-C Site Plan at SGS 2972 (Source: Applicant Project Description)

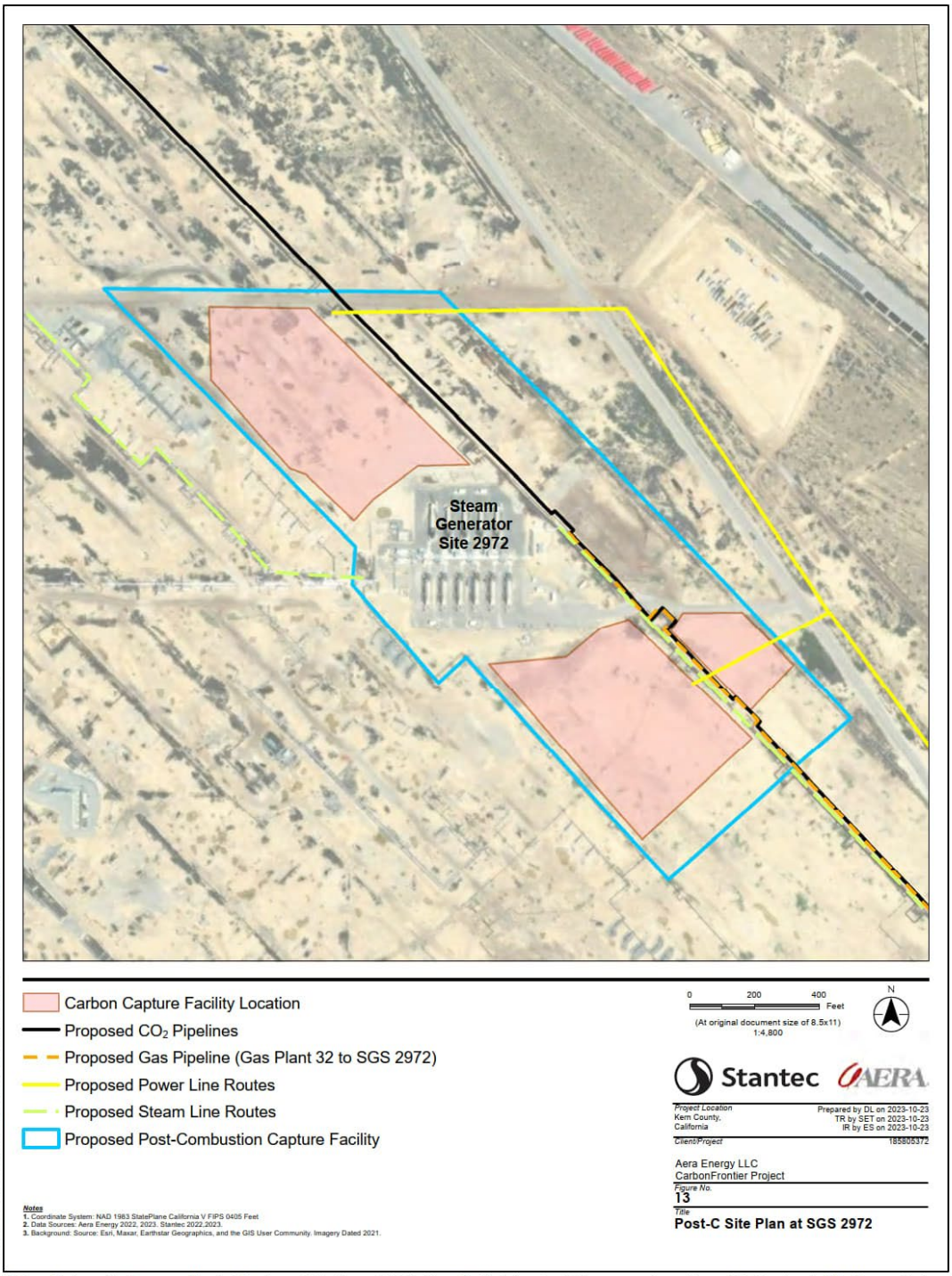

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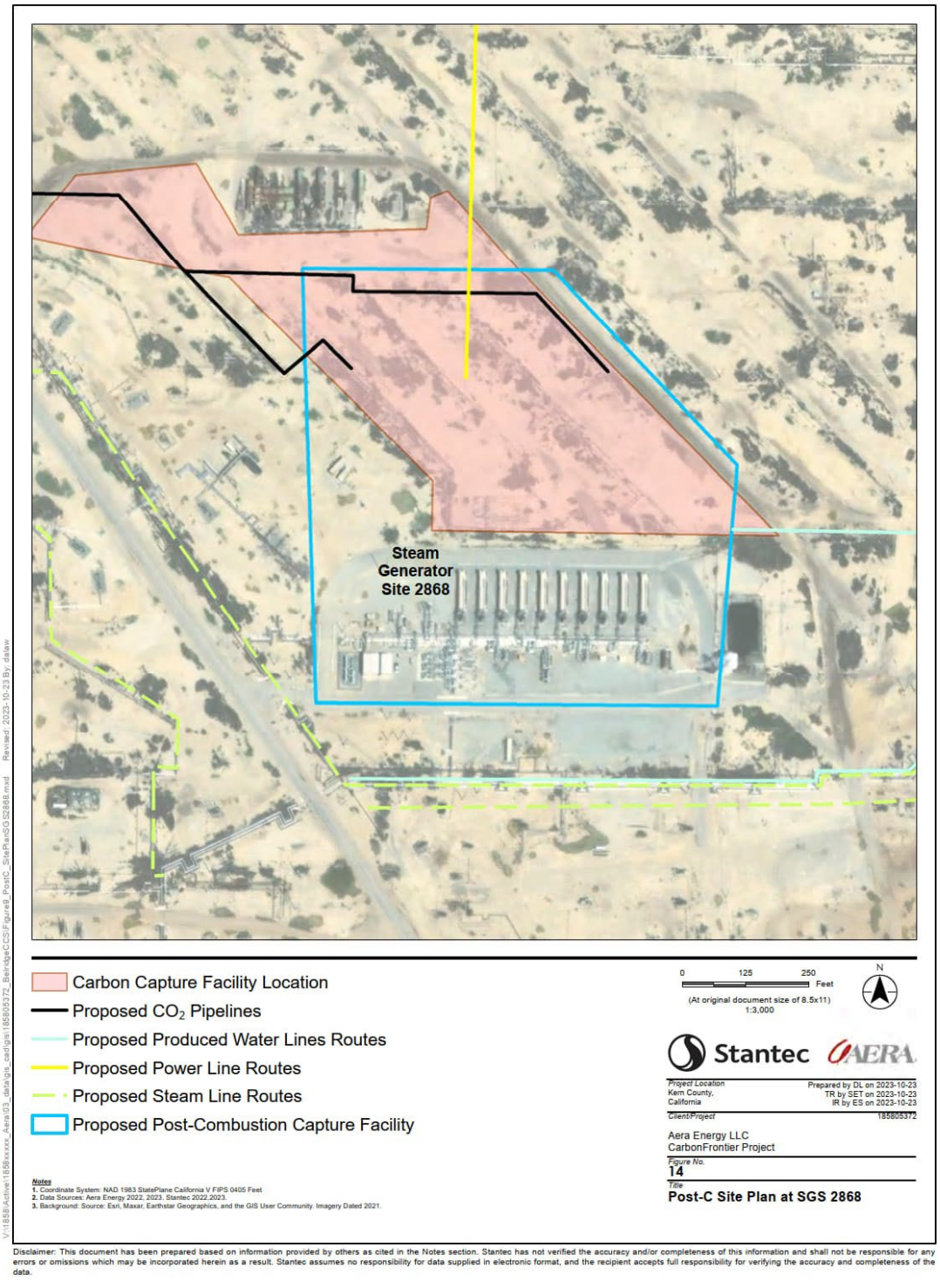
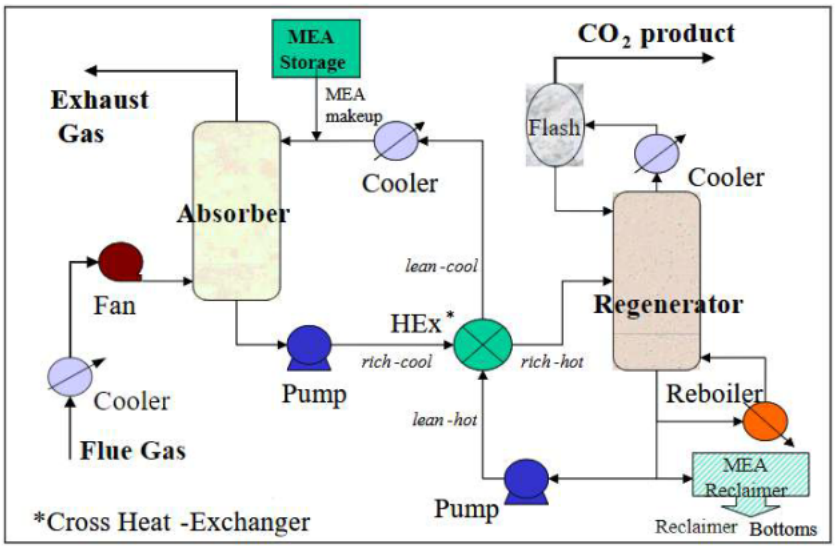
Figure 3-16: Post-C Site Plan at SGS 2868 (Source: Applicant Project Description)



In each of the three CO_2 capture and processing facilities, the flue gas would be cooled, then passed through an absorber column where an absorbent chemically reacts with and binds about 90 percent of the CO_2. The remaining flue gas (primarily oxygen, nitrogen, and the remaining uncaptured CO_2), would be vented to the atmosphere.

The rich absorbent carrying CO_2 would be piped to the regenerator column, where through the application of heat, the CO_2 would be released and captured in relatively pure concentration. The CO_2 would then be compressed, dehydrated, removed of oxygen, and piped to the CCS site. Following CO_2 release, the lean absorbent would be recycled back to the absorber column. Figure 3-17 illustrates a flow sheet for Post-C CO_2 capture.

Figure 3-17: Post-C CO_2 Capture Process (Source: Applicant Project Description)



Source: U.S. Department of Energy National Energy Technology Laboratory (2019).

The Post-C process would use the existing facility infrastructure of COGEN 32 at GP 32, SGS 2972, and SGS 2868. Figures 3-14 through 3-16 above show the Post-C facility site plans.

Future Sources – Identification

The proposed project is the permitting of the full CCS area with the injection and monitoring wells required for operation. Only one source has been identified and is analyzed in this EIR; pre-combustion produced gas stream and post-combustion flue gas from the Belridge oilfields. As operations related to oilfield operations may not provide enough captured CO_2 to produce the maximum injection capacity of 3,300,000 metric tons per year, additional existing and new CO_2 sources, completely outside the CCS boundary of 12 acres, would need to be permitted and conveyed to CTV I for permanent underground storage. No additional infrastructure, such as larger CO_2 pipelines have been included in this project for such future uses.

The future project sources would be limited to the following industries and locations:

- Location only within Kern County

- Hydrogen – Green and Blue
- Biomass Carbon Removal and Storage (BiCRS)
- Cement production
- Green Steel production
- Oilfield field gas streams
- Power Plants
- Direct Air Capture
- Alternative Fuel production

Appendix K-4 Technical memo on Sources provides a general description of these types of industries.

All projects in unincorporated Kern County would require approval of the base industry in an appropriately zoned parcel with CO_2 capture and transport requiring an additional CUP and EIR for compliance with CEQA. All CO_2 pipelines also require a CUP and EIR for compliance with CEQA. CO_2 from a source in an incorporated city in Kern County must show compliance with the preparation of an environmental document, with Kern County as a Responsible Agency and not an exemption from such review.

As noted in 3.3, *Environmental Setting*, Aera Energy, LLC Merger with CRC, the applicant for the Carbon Terra Vault 1 CCS Project, CRC, is acquiring and merging with Aera Energy, LLC the applicant for CarbonFrontier CCS. The acquiring company, CRC, and the listed companies have announced contractual relationships or interest in locating on CRC properties outside CTV I project boundary or sending CO_2 for injection to CTV I. CTV I has entered into Carbon Dioxide Management Agreements (CDMAs) with proponents of various types of facilities where there is a preliminary expectation that they would be constructed and operated onsite at Elk Hills and produce CO_2 emissions that would be captured, transported and injected into the depleted oil and gas reservoirs (26R and/or A1-A2) for permanent CCS. These agreements include non-binding commitments by the facility proponent to conduct a front-end-engineering and design study to evaluate the feasibility of locating the proposed facility at Elk Hills and by CTV I to provide access and use rights to construct and operate the facility. They also include preliminary agreements by the facility proponent to pay CTV I for accepting and sequestering at the CTV I storage complex specified volumes of CO_2 emitted from the facility. However, there are significant conditions present that must be met before any final binding agreements between CRC and third parties would be executed. Additionally, there is general uncertainty about what would be approved by the Kern County Board of Supervisors after a full review under CEQA, constructed and operated associated with these specific greenfield facilities. In addition, Golden State Hydrogen Project proposed in Tulare County. Golden State Hydrogen Project has identified in the media, the CTV I Project as a potential temporary storage location for CO_2 generated by hydrogen production, until a CO_2 storage facility in Tulare County is constructed, but CRC has not entered into a CDMA with the Golden State Hydrogen Project applicant for storage of CO_2 from that project, and project conditions would not permit a source outside Kern County for CTV I.

The following information regarding the specific companies that have publicly indicated they are interested in sending CO_2 to CTV I are generally described. All information has been provided by the CTV I applicant and the county is not party to any financial agreements or any confidentiality agreements regarding these specific companies. If and when any such sources of CO_2 emissions are advanced further, a separate CUP and associated environmental review process would accompany each project, including its infrastructure for CO_2 conveyance to the CTV I or for this project EIR - Carbon Frontier. Therefore, these projects are not required to be analyzed further in either the CTV I EIR or this EIR as approval of either Project does not compel approval, nor presume completion, of any other of the contemplated projects, no applications of these other projects are pending before the county, and there is not otherwise sufficient information available to allow for meaningful environmental review of the other projects at this time.

1. *Direct Air Capture (DAC)*. It is unknown if there is an existing CDMA or other commercial agreement between CRC and Avnos. The applicant notes that CTV I is in preliminary commercial discussions with Avnos, Inc. to construct a DAC facility that would be designed to intake and process atmospheric air to separate out CO_2. Through this process, the current expectation is that > 95 percent of the CO_2 would be separated from the air stream in volumes up to 8 metric tonnes per day that would be captured, compressed to supercritical state and piped for underground storage. The expectation is the remaining 5 percent of CO_2 would be rereleased into the atmosphere.

2. *Hydrogen*: Lone Cypress Energy Services, LLC has entered a CDMA to explore development of a clean hydrogen production plant that would produce hydrogen using a steam methane reforming process, likely using natural gas and potentially renewable natural gas as feedstock. CO_2 produced as a by-product of the steam methane reforming reaction would be captured for underground storage. While an application for the project was submitted to the county (Elk Hills Blue Hydrogen Project by Lone Cypress Energy Service) and a Notice of Preparation was released in February 2024, the project applicant has withdrawn the application.

3. *Elk Hills Power Plant CO_2 Emissions*. The Elk Hills Power Plant, an existing, operating 550-megawatt natural gas, combined-cycle power plant, located onsite at Elk Hills is owned and operated by CRC. CTV I's CalCapture project would explore capturing CO_2 emissions from the Elk Hills Power Plant for CCS in one of the CTV I reservoirs (26R and/or A1-A2).

4. *Dimethyl Ether*. InEnTec Inc. has entered a CDMA to explore development of a facility that would produce renewable dimethyl ether (rDME) from local sources of agricultural waste. CO_2 emissions from the rDME production process would be captured for underground storage.

5. *Renewable Gasoline*. Verde Clean Fuels has entered a CDMA to explore development of a facility that would produce renewable gasoline using local sources of agricultural waste as a feedstock. CO_2 emissions from the renewable gasoline production process would be captured for underground storage.

6. *Renewable Natural Gas (RNG)*. NLC Energy has entered a CDMA to explore development of a facility that would produce RNG using local sources of agricultural waste as a feedstock. CO_2

emissions from the RNG production process would be captured for underground storage. RNG produced at the facility would likely be injected into a local natural gas pipeline network for sale and use throughout California as a low-carbon fuel.

Capture Technology

Pre-C Capture

A physical solvent or a traditional amine absorption or similar process would be used to remove the CO_2 from the Pre-C produced gas stream. In the CO_2 capture facility, the produced gas stream would be passed through an absorber column where the absorbent would chemically react with and bind over 90 percent of the incoming CO_2. The rich absorbent carrying the CO_2 would be piped to a regenerator column and through the combination of reduced pressure and applied heat the CO_2 would be released from the absorbent and captured in nearly pure concentration. Following the CO_2 release, the reconstituted absorbent would be recycled back to the absorber column. The captured CO_2 would then be cooled, compressed, and pumped by pipeline to the permitted Class VI injection wells to be stored in the underground Storage Space located within the North Belridge oilfield.

Post-C Capture

Post-C facilities would be constructed at three existing facilities within the South Belridge oilfield: COGEN 32, SGS 2868, and SGS 2972. Flue gas from each Post-C source would be ducted to its own CO_2 capture facility. CO_2 would be captured using an amine absorption process or similar process. The concentrated CO_2 would then be compressed, dehydrated, and stripped of oxygen.

Similar to the Pre-C facility, each Post-C facility would include three main towers of varying height, but none taller than 140 feet in height and between 16 to 37 feet in diameter. The towers may be split into parallel units of smaller diameters. Supporting this facility would be several heat exchangers, transfer pumps, compressors, and storage area for make-up chemicals.

3.4.2 Transport of CO_2

After CO_2 is captured from the four source locations described above, the CO_2 would be transported via facility pipeline to Class VI UIC injection wells.

Facility Pipelines

Main Pipeline. A new 10-mile, 6- to 12-inch facility pipeline would be constructed primarily aboveground on pipe supports to deliver CO_2 from the capture facilities to the proposed injection wells. Because the pipeline would be contained within the existing oilfield, where public access is restricted and onsite personnel are trained in oilfield navigation and safety practices, the main CO_2 pipeline would be constructed aboveground to allow for ease of monitoring, inspection, and maintenance including early detection of damage or corrosion. Additionally, an aboveground pipeline is preferred because it is less susceptible to corrosion from soil moisture. Further, construction of an aboveground pipeline would reduce the width of the construction corridor

resulting in lowered particulate dust emissions. An aboveground pipeline would also reduce the impacts to habitat and as the pipeline would be placed on pipe supports at 2 to 4 feet above the ground surface, it would allow for wildlife movement beneath the pipeline.

The new CO_2 facility pipeline would generally follow existing pipeline corridors and contained within the existing oilfield. The facility pipeline would be primarily installed aboveground, approximately 2 to 4 feet aboveground, except where the pipeline would cross main access roads within the oilfield properties.

Distribution Pipelines. 4.7 miles of distribution piping, each approximately 4 to 8 inches, would extend from the main pipeline to the proposed injection wells. The distribution pipelines would be primarily aboveground on pipe supports, except where the pipelines cross main access roads within the oilfield, where it would be installed belowground. The pipelines would be installed belowground at the main access road crossings.

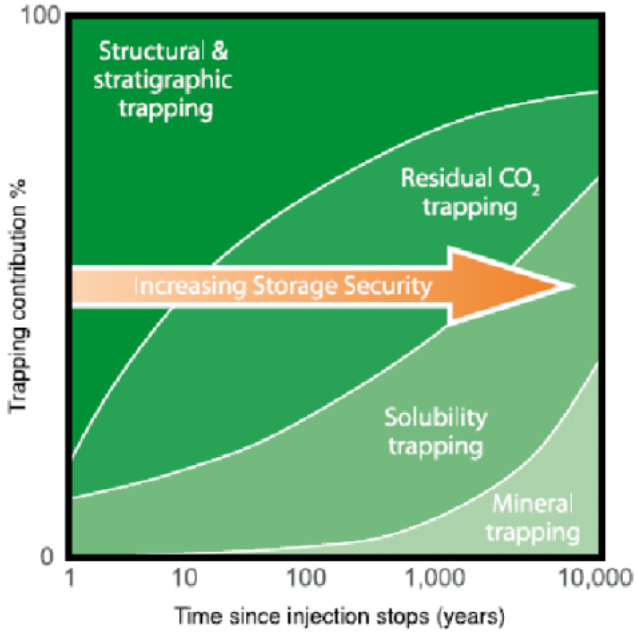
The aboveground pipeline sections would be placed on aboveground metal pipeline supports. Each support would have a concrete foundation approximately 6 to 8 feet deep. The pipe would rest on the pipe supports, which would be spaced at approximately 20-foot intervals along the pipeline length. Where pipelines are placed belowground at internal access road crossings, the proposed pipelines would be installed using conventional trenching techniques.

Pump Stations

Booster Pump Station. A new booster pump station(s) may be constructed adjacent to the existing Compressor Station 49, at each of the post-combustion recovery sites, or within Gas Conditioning Facility 32. In the early storage phases, the CO_2 may be delivered at less than dense-phase pressure as a gas. As the reservoir fills and pressure builds, injection pressure would increase. At some point the injectant would transition from vapor to dense phase. At that time Booster Pumps or additional compressors or compression stages would be installed to deliver those higher injection pressures. The pumps would be situated at (1) the point source for the CO_2 (for example, Gas Conditioning Facility 32, COGEN 32, SGS 2972) or (2) adjacent to Compressor Station 49 where the CO_2 Distribution Manifold would be placed. The design flow rate for the booster pump station is expected to be between 1.6-3.3 MMT per year.

CO_2 Proposed Storage Area CO_2 would be injected into the 64 Zone sandstones, a depleted oil and gas reservoir, roughly 8,500 feet belowground. The CO_2 would be sealed into the 64 Zone sandstones by a laterally continuous and impermeable confining layer, the Lower Santos Shale, which directly overlies them. These geologic layers have been folded into a broad anticline, or dome, which has served as a structural trap for oil and gas accumulations in the North Belridge oilfield and would serve a similar purpose for CO_2. This structural trap would prevent the upward and lateral movement of buoyant CO_2 and would function as the primary trapping mechanism. Over time, fractions of CO_2 would also be trapped through mechanisms such as residual, solubility, and mineral trapping, where CO_2 becomes increasingly immobile. See Figure 3-18 below.

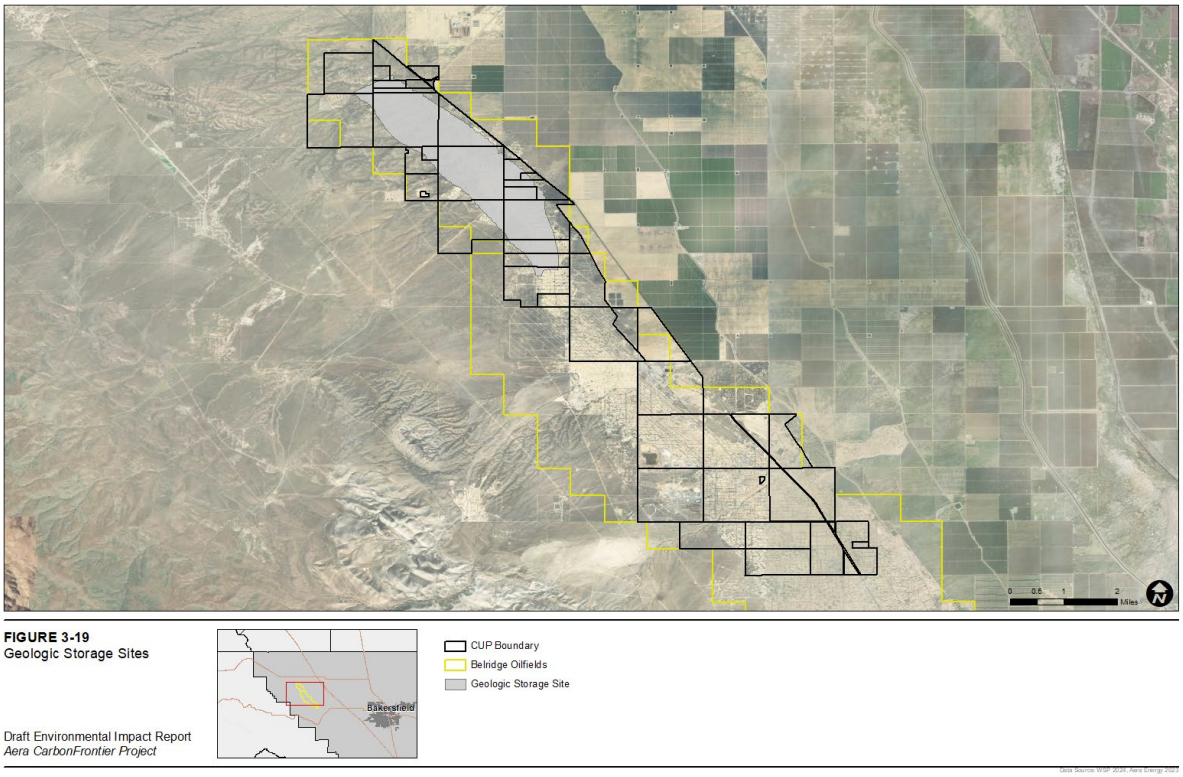
Figure 3-18: CO_2 Trapping Mechanisms Through Time (Source: Applicant Project Description)



Source: Hermanrud et al. 2009.

CO_2 captured at the sources described above would be sent for injection into up to nine Class VI UIC wells in compliance with the EPA UIC program Class VI geologic CCS regulations. Location of the proposed Class VI injection wells, as well as existing and proposed pipelines and CO_2 processing facilities is shown in Figure 3-19: Geologic Storage Sites.

Figure 3-19: Geologic Storage Sites (Source: WSP)



Geologic Formations/Storage Reservoir

In support of the EPA Class VI application, Aera Energy has fully characterized the EPA Area of Review, which would become the EPA-Approved Storage Area, for suitability by integrating static data that includes over 100 well logs, a static three-dimensional geologic model, as well as dynamic data capable of predicting the subsurface behavior of injected CO_2. The proposed injection zone is the "64 Zone" Sandstones of the Lower Temblor Formation. A 90-year record of production and injection data along with reservoir pressure measurements throughout this time provide evidence that the 64 Zone within North Belridge oilfield is an isolated compartment, bounded by sealing faults.

64 Zone Reservoir

The proposed 64 Zone injection zone reservoir was discovered in 1931 and has been developed through primary production and secondary recovery with water and gas injection. Original reservoir conditions consisted of a connate water leg, oil leg, and a gas cap. Decades of production have resulted in a depleted hydrocarbon system with mixed phase liquids throughout the structure.

There are shallower oil and gas reservoirs that are vertically isolated from the 64 Zone and that continue to be produced today. Exploration and operation activities provide extensive information from the field, forming a comprehensive database including two-dimensional (2D) and three-dimensional (3D) seismic surveys, conventional core, electric logs, and substantial production data.

These data were assembled to assess the feasibility of geologic CCS. Structural maps and cross sections were generated using the Petrel™ software platform (model parameters discussed below). The geologic model utilized 2D and 3D seismic data, and well logs from 151 wells which penetrate the 64 Zone.

The 64 Zone is a turbidite sandstone package that is folded into a northwest-southeast trending anticline that forms the structural trap for hydrocarbons in the North Belridge oilfield. The 64 Zone is a member of the Temblor Formation and is composed of two oil- and gas-producing sandstones of Oligocene age, the U and W Sandstones. The W Sandstone is composed of amalgamated turbidite sands with diminishing shale content towards the upper section, whereas the U Sandstone is a close analog to the lower portions of the W Sandstone. The injection zone is the 64 Zone (U and W Sandstones).

The injection zone sandstones are underlain by the laterally extensive Salt Creek Shales and overlain by the Lower Santos Shale (primary confining zone) of the Temblor Formation. The Lower Santos Shale is a deep-marine, low permeability, low porosity, competent claystone with thickness of more than 300 feet. Its confining ability is demonstrated by the free-phase gas cap, which was sealed in the 64 Zone over geologic timescales. Additionally, the Lower Santos Shale supported an approximately 400 pounds per square inch (psi) pressure differential between the 64 Zone Sandstones below and the Agua Sandstone above.

Wells

Injection Wells

A total of nine injection wells would be utilized for the proposed project, including four new injection wells and five existing repurposed wells, in compliance with EPA UIC regulations. Refer to Appendix E-2 for the Class VI UIC Application submitted to EPA, including attachment showing the Injection Well Design document, which includes the well-specific construction details, procedures, design criteria, current and planned wellbore schematics, and well surveys for all planned Class VI CO_2 injection and monitoring wells.

Monitoring Wells

Five existing wells are proposed to monitor the CO_2 injection operations and ensure that the CO_2 injection remains within the 64 Zone reservoir. Monitoring wells neither produce nor inject fluids. Up to an additional three monitoring wells, locations to be determined, may be proposed, pending further evaluation. Monitoring wells would be used to monitor temperature, pressure, fluid levels, acoustic signals, and for the collection of fluid and gas samples throughout the project and for 10 years after cessation of injection after which, the site would be closed. Monitoring well construction details are described in the UIC Class VI permit application submitted to the EPA included as Appendix E-2. Table 3-4 below presents the listing of proposed injection wells in the North Belridge oilfield.

Table 3-4: Injection and Monitoring Wells

Well Name	API Number	Use	Completion Formation	Surface Location Latitude	Surface Location Longitude
Existing Wells to be Repurposed					
27R-27N	0402929616	Injection	64 Zone Sandstones	35°33'2.31"N	119°48'32.13"W
64-27N	0402935068	Injection	64 Zone Sandstones	35°32'38.10"N	119°47'54.56"W
55-26N	0402935057	Injection	64 Zone Sandstones	35°32'43.10"N	119°47'36.27"W
64-35N	0402935091	Injection	64 Zone Sandstones	35°31'44.24"N	119°46'48.50"W
9-1N	0402935107	Injection	64 Zone Sandstones	35°31'31.53"N	119°46'40.54"W
1-28N	0402935069	Monitoring	Agua and 64 Zone Sandstones	35°33'22.65"N	119°48'54.97"W
25-26N	0402935053	Monitoring	Agua Sandstones	35°33'1.13"N	119°47'47.39"W
39-26N	0402935054	Monitoring	64 Zone Sandstones	35°32'54.69"N	119°47'38.62"W
27-1N	0402935115	Monitoring	64 Zone Sandstones	35°31'18.53"N	119°46'24.53"W
35X-27N	0402958271	Monitoring	Lower Carneros Sandstone	35°32'59.15"N	119°48'6.38”W
38-35N	0402929647	Seismic Monitoring	N/A*	35°32'3.6420"N	119°47'29.6741"W
New Wells					
CI1-64Z-27N	TBD	Injection	64 Zone Sandstones	35°33'9.37"N	119°48'29.90"W
CI2-64Z-35N	TBD	Injection	64 Zone Sandstones	35°32'33.09"N	119°47'41.03"W
CI3-64Z-35N	TBD	Injection	64 Zone Sandstones	35°32'11.37"N	119°47'11.53"W
CI4-64Z-35N	TBD	Injection	64 Zone Sandstones	35°31'55.30"N	119°46'55.31"W

*A downhole seismic monitoring station would be installed in existing well 38-35N before the wellbore is permanently plugged with cement, prior to commencing injection.

Operational Well Abandonments

Up to 40 operational oil and gas wells that penetrate the CO_2 CCS zone would need to be plugged and abandoned prior to project commencement. Additionally, 13 operational wells in the vicinity of SGS 2972 and SGS 2868 would need to be plugged and abandoned prior to construction of the CO_2 capture facilities at those locations.

The applicant would complete the well abandonments using existing well abandonment crews as part of their baseline annual well abandonment program.

Legacy Well Re-Abandonments

The applicant prepared the EPA submittal and conducted a search of Aera Energy's drilling records, Aera Energy's internal database, and CalGEM's WellSTAR database to identify abandoned wells which were drilled to depths equivalent to the CO_2 storage zone area. A total of 71 abandoned oil and gas wells were identified which penetrate the proposed CO_2 Approved Storage Area, up to 40 of which would need to be re-abandoned to meet regulations for CCS.

3.4.3 Field Systems

The proposed project would include the installation of a system of on-site intra-field gathering and distribution lines for various co-located services, including steam distribution within South Belridge, produced gas distribution, separated produced gas distribution, and installation of communication networks. Produced gas pipelines are discussed above in Section 3.4.1.

The field gathering and distribution system has been designed to monitor CO_2 injection operations and locate pipeline corridors on raised pipe supports to minimize external corrosion. Construction sequencing and timing for field systems would be concurrent with other additions and improvements to the existing oilfield facilities.

Steam Distribution

One of the project objectives is to reduce the carbon intensity of Aera Energy's produced oil and gas. Steam pipelines would be installed to distribute steam from the SGS 2972 and SGS 2868 sites to areas of the field where steam is currently generated without CO_2 capture. These new steam lines would allow Aera Energy to prioritize generating and supplying steam from the SGS 2972 and SGS 2868 sites with CO_2 capture. The steam lines would be constructed of pipeline in sizes ranging from 6 to 16 inches in diameter. The additional pipelines would be routed along access roads on raised pipe supports at a height of 2 to 4 feet aboveground to minimize external corrosion. Where pipelines are placed belowground at internal access road crossings, the proposed pipelines would be installed using conventional trenching techniques. A total of approximately 10 miles of new steam pipelines would be installed as part of the proposed project.

Electrical Distribution

Electrical power would be supplied from Aera Energy's 115kV distribution system and would include new distribution lines (see Section 3.4.5 Utilities and Communications) to two new 115kv/12kV electrical substations. From the substations, new 12kV distribution lines would supply power to power distribution centers adjacent to each of the CO_2 capture facilities. The power distribution centers would include disconnects, breakers, transformers, and motor control centers. Electrical power from the motor control centers would be connected to the motor and lighting loads within the CO_2 capture facilities.

Electrical power to the field loads would be run on a 12 kV primary/480-volt secondary overhead power distribution system. Pole or pad-mounted transformers would be located at the booster station and other ancillary facilities. Additionally, electrical power drops would be provided to each injection and monitoring well using nearby 12kV overhead electrical service.

SCADA Networks

A SCADA network is a control system comprising of computers, networked data communications and a graphical user interface for high-level supervision of processes. The Project would utilize a SCADA network for normal operation of CO_2 processing, pipeline, injection, and monitoring equipment. Some individual equipment may also include programmable logic controllers. The distributed control system and programmable logic controllers would control equipment and processes and provide data on process conditions and performance. When applicable, distributed control system and programmable logic controller communication would utilize fiber optic networks.

Process control and monitoring stations would be located at each of the CO_2 capture facilities. The monitoring and control stations would provide data and status information for operators to quickly identify and resolve issues. Field measurement and control equipment would be configured to be monitored and operated both locally and from the central processing facility control building. In the event of a serious out-of-normal-range condition, the distributed control system and local equipment programmable logic controllers would be programmed to safely shutdown equipment and processes. Additional information regarding emergency shut-down systems is included in Section 3.4.7 Emergency Shutdown Systems.

Injection Monitoring Systems

Each monitoring well would be equipped with downhole monitoring equipment, which would include pressure and temperature gauges and, on select wells, may also include fiber optic distributed temperature sensors (DTS) and/or distributed acoustic sensors (DAS). Pressure and temperature gauge lines would be strapped to the outside of the tubing for data transmission to surface for data collection and monitoring. Electric wireline logs would be conducted annually throughout the project to monitor CO_2 movement and reservoir pressures in the subsurface. In addition to logs, downhole samplers may be run through the tubing to recover fluid samples from the reservoir.

3.4.4 Support Infrastructure

Buildings

The project would utilize existing buildings, as well as new control rooms at the SGS 2972 and SGS 2868 capture facilities. During construction and as may be needed during project operational periods, temporary, modular buildings may be used to provide any required offices space, meeting space, storage, etc.

Domestic Water and Septic Systems

Existing available domestic water and septic systems are available at existing buildings. New domestic water from Aera Energy's existing groundwater wells located in the Buena Vista Water Storage District would be supplied to the two new control rooms. New septic systems or holding tanks would be installed at the new control rooms.

Access Roads

No new roads are proposed as part of the project. Existing lease roads would be utilized whenever feasible to access the proposed new project areas. Access roads within the South Belridge oilfield would be maintained (re-graded, covered with gravel) to allow for safe and efficient delivery of equipment to the carbon capture facility sites during the construction period and for ongoing maintenance and operations after start-up. Existing access roads within North Belridge oilfield would be utilized to provide access for pipeline and well construction. The roads would need to be repaired as needed to allow for safe and efficient access.

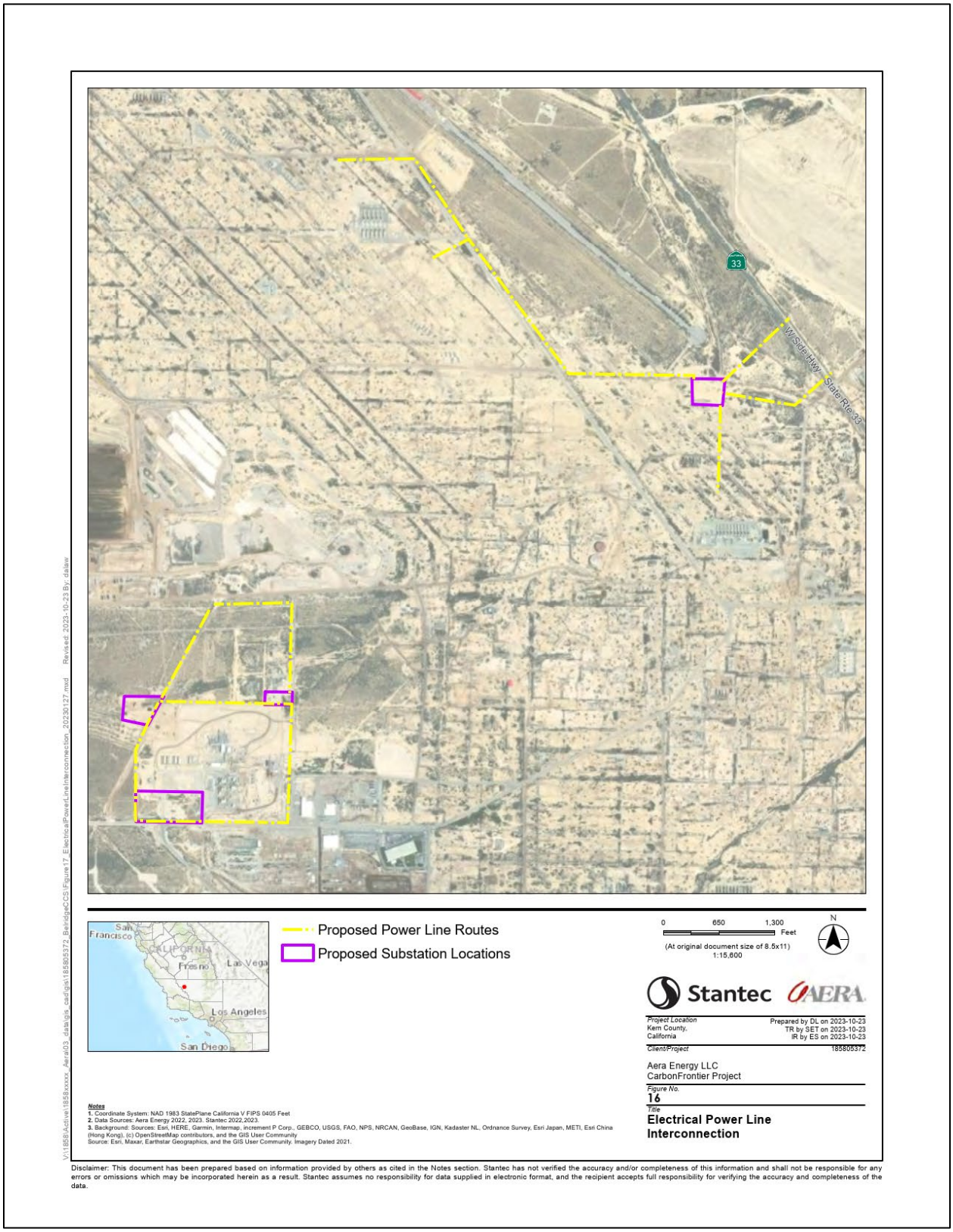
3.4.5 Utilities and Communications

Electrical Transmission Power Line Interconnection

The existing facilities on the project site are currently being served electrical power from COGEN 32 via Aera Energy's existing substations and electrical grid system. Power supplied by COGEN 32 is backed up by standby electrical service interconnection from PG&E. The project would require transmission-level service interconnection as the project site load demand increases. The expected maximum electric load of the project is approximately 49 megawatts, supplied by PG&E via Aera Energy-owned equipment, to power all facility processing, pumps, maintenance, monitoring, control, and communication systems. Therefore, the proposed project would include the construction of two Aera Energy-owned 115kV transmission power line interconnections as well as two Aera Energy-owned 115kV/12 kV substations.

The project includes two transmission lines to serve the CO_2 capture facilities, 1) an approximate 0.46-mile overhead transmission power line interconnect from Aera Energy's existing 115 kV power line along SR 33 to a new on-site Aera Energy-owned 115/12 kV substation, and 2) an approximate 0.8-mile overhead transmission power line interconnect from Aera Energy's existing 115 kV power line along Hill Road within the South Belridge oilfield to a new on-site Aera Energy-owned 115/12 kV substation adjacent to GP 32. The 115 kV power lines would be constructed, operated, and maintained by Aera Energy (see Figure 3-20: Electrical Power Line Interconnection).

Figure 3-20: Electrical Power Line Interconnection (Source: Applicant Project Description)



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Interconnection of the proposed Aera Energy-owned 115/12kV substations to the existing electric transmission grid would require construction of new 115kV power line tap from the 115kV power lines. Although design is preliminary, the power line would be supported by up to approximately 17 wooden poles. The wooden poles would be embedded approximately 6 feet deep.

The substation would consist of incoming metering and switching equipment, transformers, and protective equipment to monitor and provide protection for the various circuits providing power to the new equipment. The incoming 115kV power line would come into the Aera Energy-owned substations via overhead aluminum conductors terminating on an A-frame structure. Following the A-frame is the high voltage circuit breakers that protect the facility from over and under voltage conditions, as well as fault conditions (abnormal electric current) that may develop along the system.

PG&E Electrical Substation Upgrades

Upgrades to two existing PG&E electrical substations may be required at full Project build-out. The Temblor Substation is located on approximately 1 acre of land owned by PG&E and located 4 miles south of Seventh Standard Road within the northeast corner of Section 27, Township 29 South, Range 21 East. The replacement or expansion of the existing substation may be required with an expansion of the existing footprint. This upgrade would be implemented by PG&E and permitted at that time through the California Public Utilities Commission.

The Midway Substation is located east of the town of Buttonwillow along Highway 58, within the southeast corner of Section 13, Township 29 South, Range 23 East. The existing PG&E property covers approximately 256 acres, and the current substation occupies approximately 150 acres. The expansion of the existing substation may be required at full project build-out. PG&E would upgrade the substation.

3.4.6 Water Use

Water would be used in each of the four proposed CO_2 capture facilities. On average, the CO_2 capture facilities would require up to approximately 1,223 acre-feet/year (afy) (26,000 bbls of water per day) for the commercial operation of the project. Water for CO_2 capture facilities would be sourced from existing Belridge oilfield produced water that is currently injected in Class II injection wells. Water treatment facilities would be installed at the CO_2 capture facilities to treat the produced water. Water pipelines would be constructed, primarily aboveground, from the new water treatment facilities, to return some of the produced water back to existing water distribution systems and Class II injection wells. Fresh water would be sourced from existing State Water Project (SWP) entitlements with the Belridge Water Storage District (BWSD) and from existing Aera Energy-owned groundwater wells located in the Buena Vista Water Storage District. Fresh water from these sources would be minimally used for utility purposes including fire protection, lavatories, showers, equipment cleaning, dust control, and soil conditioning during construction. SWP water needs would not exceed volume available under Aera Energy's existing water contracts. Water required for construction is outlined in the Construction section of this document. The project would also require approximately 400 acre-feet (af) over an approximate 3-year construction period. Proposed

construction water demands for the project are anticipated to be purchased from existing BWSD SWP entitlements and other existing long-term water contracts with individuals and delivered to the project area via BWSD's 415 North Canal and/or 500 Canal and existing pipeline. Aera Energy also has approximately 7,000 af of surplus SWP and Kern River water banked in various groundwater banking projects through the BWSD that may be accessed at any time, subject to the groundwater bank's pumping capacity.

3.4.7 Emergency Shutdown Systems

Aera Energy has developed an Emergency and Remedial Response Plan (ERRP) specifically tailored to the proposed CO_2 operations at the proposed Project site. The ERRP describes actions that Aera Energy would take to address movement of the injection fluid or formation fluid in a manner that may endanger an USDW during the construction, operation, or post-injection site care periods for the project. The ERRP is intended to meet the requirements of 40 CFR 146.94 Emergency and Remedial Response.

If Aera Energy obtains evidence that the injected CO_2 stream and/or associated pressure front may cause an endangerment to a USDW, human health and safety, and the environment, Aera Energy would perform the following actions in consecutive order:

1. Cease injection
2. Take all steps reasonably necessary to identify and characterize any release
3. Notify the EPA's UIC Program Director and California Air Resources Board (CARB) Executive Officer of the emergency event within 24 hours
4. Implement applicable portions of the approved ERRP

In some cases, particularly where safety is involved, Aera Energy would immediately cease injection. However, in some circumstances, Aera Energy would, in consultation with the UIC Program Director, determine whether gradual cessation of injection would be appropriate. Refer to Appendix E-2 for the Class VI Application, including complete ERRP submitted to the EPA.

Control systems would be installed on individual injection and monitoring wells to monitor system performance and subsurface conditions. In the event of an emergency, Aera Energy operators would remotely activate closure of an emergency shutdown valve on the flowline from that well or for the entire pipeline system. The emergency shutdown valve protects the distribution system and other downstream pressure piping from overpressure. In the event of a system shutdown, the CO_2 may be vented at a safely located and controlled vent location to protect against damage to facilities, pipelines, and wells.

3.5 Construction

3.5.1 Construction Phasing and Equipment

This section describes the construction of the project components discussed in Section 3-4 (Proposed Project Characteristics). The project is proposed to be implemented in phases to maximize efficiency and help moderate construction activity levels. Most of the processing facility construction would occur over a three-year period, expected to start in 2025 after the applicable permits are issued.

CO_2 capture facility and infrastructure construction would occur for approximately three years, starting with the Pre-C facility construction at GP 32. Sequential construction would occur for construction of the Post-C facilities located at COGEN 32 (one) and the two SGS. Injection well pad construction, drilling and plugging and abandonment activities, and facility pipeline construction activities would begin concurrently with the start of facility construction. Installation of CO_2 distribution pipelines, installation of intra-field electrical distribution, and well hookups would occur throughout the three-year period.

Construction Personnel and Traffic

Equipment and personnel requirements would vary throughout the course of any given year and across the life of the project depending on the construction activities underway. However, it is estimated that the peak construction workforce trips per day would be approximately 300 people and the peak construction equipment vehicle trips per day would be 15 trips. Refer to Section 4.17 for more information on construction trip generation.

Drilling rigs would operate 24 hours per day while drilling, and the proposed injection wells are expected to take approximately 14 days to complete. Drilling crews consist of six to seven contractors who would typically be on-site for 12-hour shifts, one starting at noon and the other starting at midnight.

Construction Timing

Construction of the proposed project is anticipated to require approximately three years to complete. Initial activities are expected to start in 2025 and would include the following tasks: mobilization, demolition, well abandonments, surface facility construction, pipeline construction, and well drilling. Activities in 2026 and 2027 would include well abandonments, facility construction, and pipeline construction.

Equipment and Personnel Requirements

Table 3-5: Equipment and Personnel – Peak Estimates provides an annualized summary of anticipated equipment and personnel requirements during construction for each of the major project components (processing facilities, field infrastructure, and utilities). Equipment and personnel

requirements vary throughout the course of any given year and across the life of the project; therefore, peak year counts and timing are provided.

Table 3-5: Equipment and Personnel – Peak Estimates

Activity	Peak Monthly Count	
	Personnel	Equipment
On-Site Roads	8	8
Facilities Pad Grading	15	15
Well Pad Grading	14	14
Well Drilling	17	17
CO_2 Capture Facilities	96	92
Compressor Station Construction	28	41
CO_2 Main Pipeline	29	29
Distribution Pipelines	23	23
Gas Lines	20	20
Steam Lines	20	20
Water Lines	20	20
Electrical Transmission Line	12	12
Intra-Field Electrical Distribution	12	12
On-site Electrical Substations	18	18
Demolition	12	12

3.5.2 Site Preparation

Proposed Grading and Site Development

The project would require the minor grading of the proposed CO_2 capture facilities, totaling approximately 40 acres, most of which is previously disturbed area. The project would maximize the use of existing roads, well pads, and cleared areas wherever possible. Each well pad would be approximately 145 feet by 280 feet in area. Each well pad would be cleared of vegetation and

leveled to prepare it for well drilling. Any excess spoils would be transported to a designated fill location within the project site for reuse as fill material or moved off-site to an appropriate soil disposal or reuse facility. Proposed cut and fill volumes are approximately 208,100 cubic yards total.

Additional ground disturbance would occur for construction of the utilities component of the project, including water pipelines and overhead power lines. The estimated disturbance from the project pipelines would be minimized as most would be located aboveground, placed on existing and new pipe supports and along existing pipeline corridors. The estimated ground disturbance for the 115kV and 12kV power line would be approximately 2.1 acres. Refer to Table 3-6: Site Disturbance Area below.

Table 3-6: Site Disturbance Area

Project Component	Temporary Disturbance Area (acres)	Permanent Disturbance Area (acres)	Grading Volume (cubic yards)[a]
Pre-C Capture Facility (GP32)	2	2	7,000
Post-C Facility at SGS 2868	12	9.6	39,000
Post-C Facility at SGS 2972	16	14	52,000
Post-C Facility at COGEN32	9.7	9.7	32,000
Booster Pump Station	0.5	0.5	1,600
Injection Well Pads (9 total)	8.5	8.5	27,500
Monitoring Wells (9 total)	8.5	8.5	27,500
CO_2 Pipelines (15.8 miles)	95.8	9.6[b]	NA
Gas Lines (5.1 miles)	22.5	2.3[b]	NA
Water Lines (4.2 miles)	21.4	2.1[b]	NA
Steam Lines (7 miles)	42.5	4.3[b]	NA
Electrical Lines (1.3 miles)	2.1	1	NA
Electrical Substations (2)	5	5	16,200
Staging Area	25	25	NA
Road Improvements	--	6.6	5,300
Legacy Well Re-abandonments	26.29	--	NA

Project Component	Temporary Disturbance Area (acres)	Permanent Disturbance Area (acres)	Grading Volume (cubic yards)[a]
TOTALS:	272[c]	108.7[c]	208,100

Notes:

a. Assumes 2 feet over-excavation and recompacting
b. Assumes 5-foot-wide permanent disturbance for above-ground piping
c. Some disturbance areas overlap
d. Assumes 7.25 miles of roads, 25% would require maintenance, 30-foot-wide disturbance, 0.5 feet average depth

NA=Not applicable. Some pipelines are co-located.

Removal and Demolition of Existing Facilities

The proposed CO_2 capture facility areas currently contain piping and other idle equipment that would be removed, and wells that would be permanently abandoned, prior to construction of the proposed facilities. There is some debris from former operations, such as broken concrete, in scattered locations throughout the Project site. Debris would be reused or recycled to the extent feasible. Five shipping pumps, two water tanks, two electrical transformers, a water heater, an electrical panel, and one moisture separator would be removed or demolished on the land north of GP 32; all equipment is out of service. Demolition of various oil production facilities (old pipeline) and equipment (a production header) would occur on approximately 9 acres of land around SGS 2868. Miscellaneous rubble piles would also be cleared. Demolition of various oil production facilities (including old foundations and pipeline) and equipment would occur on approximately 16 acres of land in areas around SGS 2972.

The proposed CO_2 capture facility areas also contain abandoned structures that would be demolished prior to construction of the proposed facilities. Demolition of a sulfur treatment facility, maintenance shed, old equipment yard, and a building would occur on approximately 1.5 acres of land at GP 32. The to-be-demolished building holds a former Control Room, Lab, Conference Room, and associated offices. The old equipment yard currently stores three gas compressors and five cylindrical gas tanks, which would be relocated prior to demolition. One storage building would be demolished on the land northeast of GP 32.

3.5.3 Well Construction, Drilling, Completion, and Decommissioning

The proposed project includes repurposing five existing oil wells and drilling four new wells for use for CO_2 injection activities. Additionally, five existing wells would be converted to monitoring wells to monitor the CO_2 plume and up to three additional new monitoring wells may be required over the life of the project.

The project estimates a water demand of approximately 400 af over an approximate 3-year construction period (refer to Section 3.4.6).

Well Pads and Roadways

Well locations have been carefully selected to minimize disturbance by reusing existing well pads, where feasible, and to allow for the permanent CO_2 CCS within the dedicated zone. Well pads have been designed to minimize the amount of surface disturbance while meeting the technical constraints of drilling and operating the wells. Areas within the designated well pad area would be cleared of all vegetation and other deleterious material utilizing heavy equipment. The proposed wells would be constructed on existing well pads; however, these pads may need to be cleared of encroaching vegetation or enlarged to meet project requirements. Earthwork would be completed utilizing conventional equipment (e.g., dozers, loaders, scrapers, motor graders, excavators, sheep's foot compactors, smooth drum rollers, water trucks. etc.).

Injection Well Drilling and Completion

Pad Area and Drilling Rig

Well pad construction would minimize additional ground disturbance through use of existing pads and disturbed areas to the extent feasible. Approximately 8 acres would be permanently used and maintained for the injection well pads during the life of the project. The selected monitoring wells are all existing wells. Minor well pad maintenance may be conducted at each monitoring well location. Should additional monitoring wells be proposed, up to 3 acres (0.75 acres per monitoring well location) may be permanently used and maintained to accommodate these additional wells.

Drilling rigs would operate 24 hours per day while drilling, and depending on the type of well, would operate consecutively for up to 14 days at each location. The specific rig has not been determined at this time, but the rig would be the equivalent to Kenai #18. Kenai #18 is 279 feet long and 120 feet wide with a footprint of approximately 33,500 square feet. The rig has a 121-foot-tall mast which sits on the drill rig floor. However, Kenai #18 has a 750,000-pound static hook load capacity, which exceeds Aera Energy's standard currently used for drilling in the San Joaquin Valley.

Since a larger rig footprint may be required as the project develops, Aera Energy is planning to utilize the larger rig (Kenai #18 or equivalent). Additional drilling equipment for either rig would include the following: fluid handling equipment, waste storage containers, four generators, mud handling system, blow out prevention equipment, spill prevention equipment, hydrogen sulfide detection equipment, three mud pumps, cuttings bin, catwalk, trailer (also referred to as "doghouse") and others. Note, the equipment listed is for a typical drilling operation, the exact equipment list and layout may vary depending on the specific well to be drilled.

Construction Methodology

The proposed drilling and completion operations would be performed in accordance with the EPA UIC Class VI well regulations. The installation/drilling of the injection wells is a multi-step

process. Once a well drilling location is determined, and prior to the arrival of a drilling rig, a conductor pipe with diverter valves is installed. These valves would allow any fluid that flows into the wellbore during drilling to be diverted and controlled. The drilling rig and supporting drilling equipment is then set up on location and the drilling process begins. This is called the "spud" of a well.

To progressively deepen the wellbore, a downward force must be exerted on the drill bit. This downward force is provided by the drill pipe that is attached to the drill bit. As the bit continues to drill downward, more pipe is attached on top thereby increasing the weight on the bit. The drill bit rotates as it moves down the wellbore. The rotating action is produced by a rotary table, top drive, or motor; depending on which drilling rig type is being utilized.

Rock cuttings are generated as the drill bit spins on the rock formation it is drilling through. These cuttings must be removed from the wellbore by drilling fluids (drilling mud). The drilling fluids are pumped through the drill pipe, out of the openings in the drill bit and then back up between the space between the drill pipe and the hole (this is referred to as the annulus). The mud handling equipment at the surface separates the cuttings from the mud and recycles the mud to be used again. In addition to circulating the drill cuttings, drilling mud provides lubrication and cooling to the drilling bit and well control by changes to the drilling mud weight.

Once the wellbore is drilled to a specified depth, the drill pipe is pulled out of the hole and casing is installed. Casing is pipe that is permanently installed in the wellbore to stabilize the hole, prevent entry of wellbore fluids, and help to prevent the exit of drilling muds out of the wellbore. Once the casing has been run to the specified program depth, it is then cemented in place. Cement is pumped down the inside of the casing string and circulated up the annulus. Cement volumes are calculated by the hole and casing geometry plus a specified excess percentage. For this project, casing and cementing specifications would follow the requirements of the EPA's UIC Class VI well regulations (40 CFR 1467.81 et seq.). Cement volumes are always greater than the annulus volume. Cement is displaced down the inside of the casing by water and a rubber wiper plug. The wiper plug ensures cement is being displaced sufficiently and doesn't allow for water to channel through the cement. This helps to ensure the wellbore would have a secured casing shoe. Water displaces the plug and cement down the inside of the casing string until the wiper plug reaches the insert valve. Once the wiper plug reaches the insert valve the displacement pressure increases significantly which signifies the cement has been displaced to the proper depth. The insert valve ensures that cement stays in place and does not "U" tube back into the casing string. The cement then sets, sealing the outside of the casing to the wellbore.

A smaller drill bit is then placed into the wellbore and the well is drilled deeper. This process continues with subsequently smaller drill bits and smaller casing strings being installed until the completion depth is reached. Once the wellbore is drilled to a specified depth, the drill pipe is pulled out of the hole and casing is installed. Casing is a steel pipe that is permanently inserted into the wellbore to create a barrier to prevent fluid transmission. Once the casing has been run to the specified depth, it is then cemented in place, effectively sealing the outside of the casing to the wellbore. The casing also serves as the foundation for the blowout preventer.

A total of three casing strings would be installed on project wells. A surface casing would be installed which would extend to the base of potential USDW zones to 1,000 feet. Next, an intermediate casing string would be installed which would reach to the depth of approximately 6,100 feet and then be cemented in-place using a EPA-approved cementing process and pressure-tested to confirm mechanical integrity. The injection casing would be installed to the top of the proposed injection zone and cemented through a EPA-approved cementing process and pressure-tested to confirm mechanical integrity. A sufficient number of casing centralizers would be used to centralize the casing and liner to 70 percent standoff or greater.

Next, the injection liner piping (long string casing), consisting of materials compatible with exposure to the injected fluid, would be installed through the injection zone. The injection liner would be inserted into the well and cemented in place. Evaluation logs would be completed to confirm that the annulus cement has integrity and would prevent movement of fluids between zones and prevent movement of CO_2 to any upper zones in the well. The liner would be pressure tested after it is cleaned out to confirm mechanical integrity. The injection well would be completed by perforating the liner within the designated injection zones. Completion equipment consisting of a packer, monitoring equipment, and tubing would be installed. Refer to Appendix E-2 Class VI UIC Application for Well Construction Details.

Well Drilling Fluids and Cuttings Disposition

The drilling process would primarily use a water-based drilling mud. The primary components of this system are gel and water. Deeper formations may require an oil-based drilling mud system where the primary component is oil instead of water. On average, injection wells would take approximately two weeks to drill, resulting in approximately 1,674 bbls of mud (approximately 70,000 gallons of water equivalent) and 372 bbls of cuttings per well. The drilling fluids and cuttings would either be reused on-site (i.e., cuttings may be used on-site for fill) or solidified and then transported to an approved facility for recycling or disposal.

Hydrogen Sulfide Monitoring

Hydrogen sulfide gas is known to occur in the 64 Zone and overlying formations. The Aera Energy "H2S Protection Program" operations, which addresses monitoring equipment requirements, personnel training and responsibilities, first aid, and evacuation procedures. This program would be followed throughout the drilling and general operations and maintenance activities. Continuous ambient air monitoring for both hydrogen sulfide and lower explosive limits would be in effect for the entire drilling process (Aera Energy, 2017).

Blowout Prevention Equipment

Blowout prevention systems are safety systems that are used in the drilling of an oil and gas well. These systems prevent the uncontrolled release of reservoir fluids and shut off flow to prevent spills and material releases. Blowout prevention equipment would be used during drilling and removed once the well has been completed and secured. Blowout prevention equipment would conform to the CalGEM/DOGGR publication M07 "Blowout Prevention Equipment in California, Equipment Selection and Testing" 2006 Edition.

Lighting System

The drilling operation would provide sufficient lighting to ensure safe working conditions. Vapor proof lighting and wiring would meet the California Division of the U.S. Occupational Safety and Health Administration (OSHA) specifications. The top of the drilling derrick would have a red beacon to address potential aviation hazards. Rig lighting would be aimed towards the project site, and away from night sky and neighboring properties.

Well Repurposing

Within existing wells to be converted to CO_2 injection wells, the completion equipment would be removed, and the well would be cleaned out to the required depth for injecting into the 64 Zone Sandstone CCS zones. Casing inspection and cement evaluation logs would be run to confirm that the annulus seal through the confining layer is sufficient to prevent movement of fluids behind the existing long string casing.

A new inner casing would be installed and cemented to surface. The inner casing design would consist of materials compatible with exposure to the injected fluids. The cement and additives would be compatible with the injection and formation fluids as required by EPA UIC Class VI well regulations. A sufficient number of casing centralizers would be used to centralize the casing and liner to 70 percent standoff or greater. The new long-string inner casing would isolate the existing casing thereby resulting in a wellbore that meets Class VI requirements. The casing would be pressure tested prior to drilling out the shoe to confirm mechanical integrity.

Repurposed wells that require an inner liner would have a new inner liner run and cemented to the top of the liner. The new inner liner and cement that would be compatible with the injection stream and would isolate the existing liner from the injected fluids. The liner would be pressure tested after it is cleaned out to confirm mechanical integrity.

The injection well would be completed by perforating the authorized injection zones. Aera Energy would ensure that no loss of containment occurs during well stimulation (see Section 3.5.3) later by maintaining at least 20 feet of separation between the base of the primary confining zone and the top wellbore opening to the injection zone below. Completion equipment consisting of a packer, monitoring equipment, and tubing would be installed. The flow-wetted components of the packer, tubing, and wellhead would also use material compatible with the injected fluid.

Monitoring Well Modifications

The construction procedures for repurposing of existing wells to monitoring wells are similar to repurposing wells for injection. The differences include perforation intervals in the appropriate zones to be monitored, and smaller outside diameter tubing would be used if the tubing inside diameter is large enough to allow running wireline logging tools and downhole sampler equipment that are planned to meet periodic monitoring requirements as required by EPA requirements.

Well Stimulation

Aera Energy believes that the injection zone (64 Zone Sandstones) would require stimulation in all project injection and monitoring wells, including wells either repurposed to or newly drilled for Class VI service. The stimulation program would be necessary because depleted reservoir pressure in the CCS zone would cause fluid losses during drilling and completion operations, and cement losses during primary cementing of injection liners. Stimulation to remove this initial near-wellbore damage would occur after well construction is finished but prior to the start of CO_2 injection.

Well stimulation may also be necessary on specific injectors after the start of CO_2 injection if low initial injectivity is encountered or if reductions in ongoing injectivity are observed.

The method used for all stimulation work would be matrix acidizing. In compliance with the CARB CCS Protocol under the Low Carbon Fuel Standard, Aera Energy would ensure that no new fractures develop during stimulation by limiting pump pressures to a maximum of 80 percent of the CCS zone fracture gradient, measured or calculated during Pre-Operational Testing (CCS Protocol C.3.3[b]). Additionally, Aera Energy would ensure that no loss of containment occurs by maintaining at least 20 feet of separation between the base of the primary confining zone and the top wellbore opening to the injection zone below.

All chemical additives used in the stimulations would be tested and confirmed compatible with the injection and confining zones.

Downhole Monitoring Equipment

Injection and monitoring wells would be equipped with downhole devices and equipment to evaluate external mechanical integrity of the wells and monitor growth of the CO_2 plume. The wells would be designed to allow the use of these testing and monitoring devices and workover tools as required by EPA regulations. Downhole monitoring equipment would include pressure and temperature gauges and, on select wells, and may also include fiber optic distributed temperature sensors (DTS) and DAS. Pressure and temperature gauge lines would be strapped to the outside of the tubing for data transmission to surface for data collection and monitoring. The DTS and/or DAS line would be cemented in the annulus between the inner (injection) casing and the outer casing. The annuli would be sized to allow for data lines and clamps to be installed for downhole monitoring devices lines.

The internal diameter of the tubing planned for observation monitoring wells would be sized to allow running wireline logs such as pulsed neutron, saturation, pressure, and noise. In addition to logs, downhole samplers can be run through the tubing to recover fluid samples from the reservoir. The ID of the tubing planned for injection wells is sized for the planned injection rate.

Well Decommissioning

Existing wells that require decommissioning (plugging and permanent abandonment) as part of the construction of the proposed project would follow the decommissioning procedures listed below:

1. Remove surface equipment (such as flowlines, sensor equipment, non-well control valves, and miscellaneous debris) from location

2. Move in subsurface equipment

3. Perform pre-cementing operations, kill the well, conduct pre-abandonment tests if required by regulations, and remove rods, tubing, pump, and other equipment

4. Clean out wellbore to effective depth

5. Complete cementing operations, including the following. Set the bottom hole plug across perforations as specified in California laws or CalGEM regulations. Tag cement to confirm hardness per CalGEM regulations. Bring cement up to next marker. Perforate and isolate any un-cemented annuli if they exist at required zone tops through a variety of methods. If un-cemented annuli do exist, timeline for well abandonment would be extended. Tag cement at each relevant marker. Steps described previously would be repeated until cement is at surface.

6. Top off cement with surface crew if necessary

7. Cut-off well head 5 feet below grade

8. Weld metal plate with ending 5 digits of API number on top of cemented well head

9. Restore location to original grade

Wells that require re-abandonment as part of the Corrective Action associated with the UIC Class VI application would require a separate decommissioning procedure, as described below:

a) Set bottom-hole CO_2-resistant cement plug across 64 Zone Sandstones perforations to at least 100 feet above the perforations

b) Tag cement to confirm hardness

c) Bring cement up to next marker so that the CCS complex is covered with CO_2-resistant cement from at least the 64 Zone Sandstones up through the Upper Santos Shale (note: CO_2-resistant cement is not required at depths above the Upper Santos Shale)

d) Perforate and isolate un-cemented annuli if they exist at required zone tops through a variety of methods

e) Tag cement at each relevant marker

f) Repeat Steps c-e until cement is at the top of the old casing stub

1. Top off cement with surface crew if necessary

2. Weld metal plate with ending five digits of API number on top of existing casing stub

3. Backfill hole above the casing stub to surface

4. Restore location to pre-project grade

3.5.4 CO_2 Capture/Processing Facilities Construction

Grading for the CO_2 capturing facilities would occur over an approximate 3-year construction period and would requ-ire approximately 40 total acres of disturbance on areas with pre-existing disturbance. The following outlines construction procedures associated with grading and installation of the processing facilities in consecutive order:

- **Environmental Survey.** Pre-activity biological surveys would be completed prior to initiating work.
- **Staging.** Material and equipment would be gathered on-site.
- **Inspection.** Material and equipment would be inspected for quality assurance. Construction equipment would be verified to meet applicable environmental regulations. Equipment operators and field workers would be verified to possess the proper qualifications.
- **Civil.** Soil would be graded and excavated. Concrete equipment foundations, pipe supports, pads and containment would be poured.
- **Equipment.** Major vessels and equipment would be set on foundations.
- **Supports.** Pipe supports would be installed.
- **Plant Piping.** Piping, valves, and instrumentation would be installed between equipment and vessels. Welds would be radiographed and connections strength tested.
- **Electrical.** Electrical panels, conduit, and power wiring would be installed.
- **Instrumentation**. Instrumentation signal wiring and tubing would be installed. Terminations would be made at the instrumentation and connections would be tested.
- **Corrosion Control**. Piping and non-galvanized structural steel would either be insulated or primed and painted. Buried steel piping would be coated or wrapped with protective coatings. Cathodic protection would be used in certain areas to protect buried steel piping from external corrosion. Insulating kits would be used to protect buried steel piping from external corrosion. Insulating kits would be used to isolate above-ground from buried piping.
- **Start-Up Preparation**. All valves and instrumentation would be put in normal operating positions/modes for start-up. All safety devices would be checked for proper operation.
- **Personnel Training**. Operators, mechanics, and instrument mechanics would be trained to operate and maintain the facilities.
- **Start-Up**. Plant would be started and tested for proper operation. Any problems or issues would be resolved.

- **Operation**. Normal operation would commence.

3.5.5 CO_2 Pipeline Construction

The project would require the installation of a new 10 mile, 6- to 12-inch CO_2 facility pipeline and 4.7 miles of CO_2 distribution facility pipelines that would connect the CO_2 capture facilities to the injection wells. The facility pipelines would be built primarily aboveground within Aera Energy's existing operating properties. The CO_2 facility pipelines would be in place prior to the first CO_2 injection.

Excess spoils generated during the course of the facility pipeline construction project would be transported to a designated fill location within the project site for reuse as fill material as part of the project or would be disposed at a permitted disposal site.

Access and Staging Areas for Pipeline Construction

The CO_2 facility pipeline component of the project would be accessed from existing oilfield access roads. No new roads would be constructed as part of this component of the project and no existing roads would require additional grading or improvements for the pipeline construction activities. Existing disturbed areas would be utilized for facility pipeline construction staging areas.

Pipeline Construction Methodology

Construction and installation of the CO_2 facility pipeline would be primarily aboveground, resting either on existing 2 to 4 feet aboveground pipe supports or new supports. At designated internal road crossings, the facility pipeline would be installed through a combination of conventional trenching and jack-and-bore techniques (Figure 3-21: Typical Pipeline Construction, Figure 3-22: Typical Jack and Bore Work Area).

Figure 3-21: Typical Pipeline Construction (Source: Applicant Project Description)

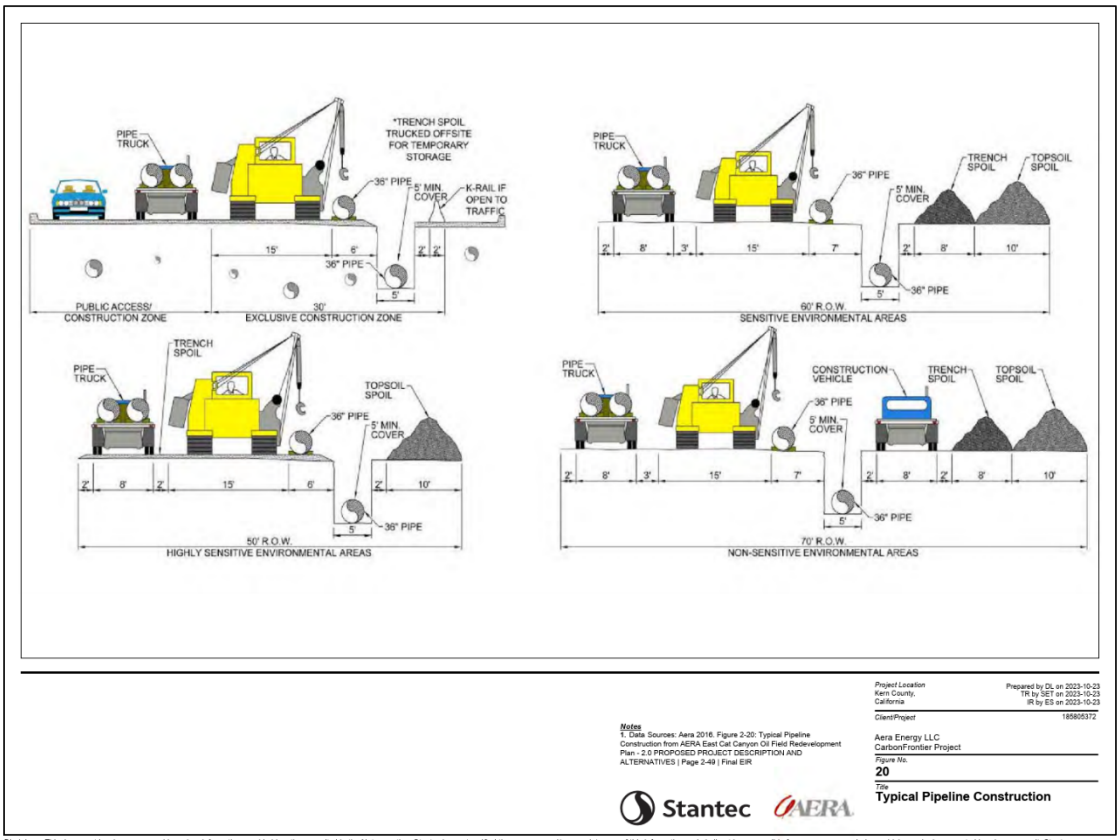

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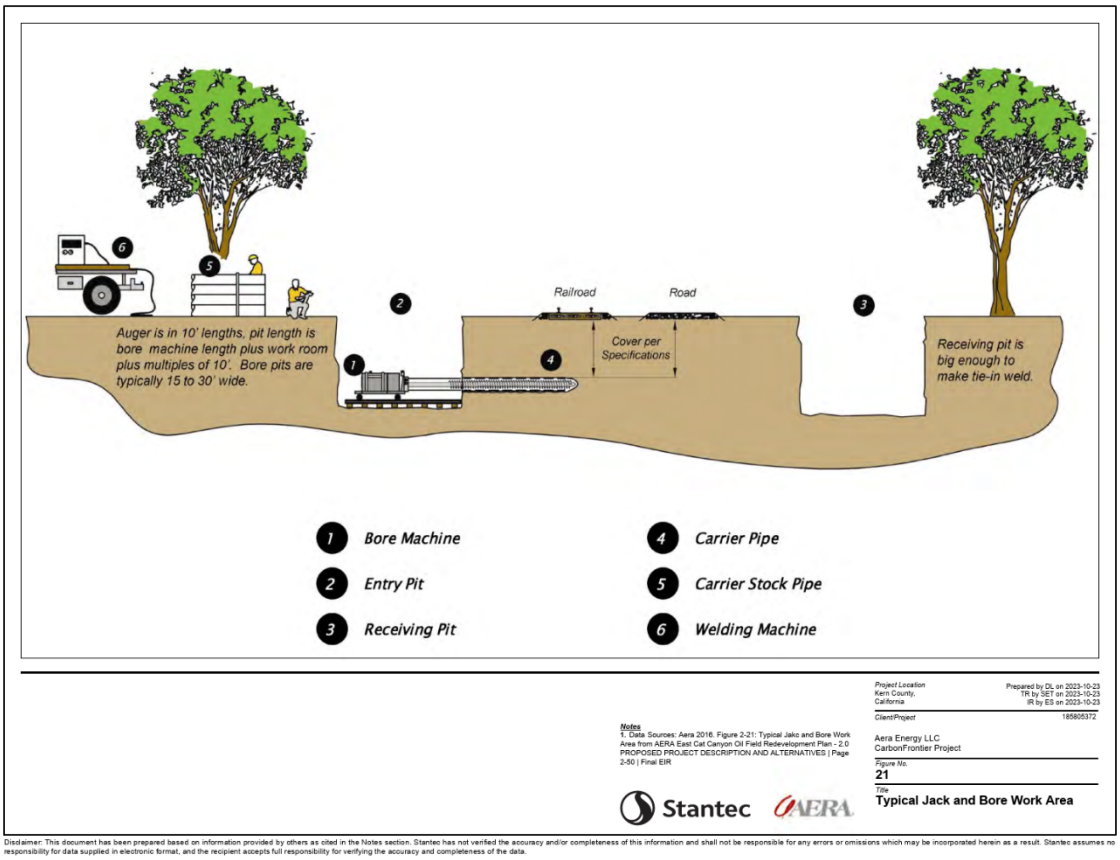
Figure 3-22: Typical Jack and Bore Work Area (Source: Applicant Project Description)



The sequence of construction activities for the CO_2 facility pipeline component of the project is summarized below. Construction of the CO_2 facility pipeline is scheduled to take approximately six months.

- **Mobilization and Staging.** Prior to construction, the contractor would mobilize the site and establish staging areas for materials and equipment storage. Construction equipment would be staged along the route and would progress with the pipe installation.
- **Surveying, Staking and Flagging.** The centerline would be marked at line-of-site intervals, at points of intersection (including offset stakes marking the edges of the right-of-way, and at all known underground facilities. In addition, any environmentally sensitive areas (i.e., biological, cultural, and/or hydrological resources) would be clearly marked.
- **Clearing and Grading.** The majority of the temporary construction easement occurs along the previously disturbed pipeline corridors. Where necessary, existing vegetation would be cleared and the ground within the construction right-of-way would be graded and smooth to provide safe and efficient operation of construction equipment.

- **Hauling and Stringing.** The pipe would be hauled by truck to one of the staging areas where it would be offloaded by cranes and loaded onto stringing trucks to be delivered to the construction right-of-way.
- **Pipe Supports.** Pipe supports would be constructed at approximately 20- to 30-foot intervals along the pipeline, as needed. A truck-mounted drill would be used to auger a 24-inch to 36-inch diameter hole approximately 6 to 8 feet deep. The pre-fabricated steel, or alternate, pipe support would be set into the hole and the hole would then be backfilled with concrete.
- **Trenching.** The typical trench would be approximately 5 feet deep and between 2 and 5 feet wide. Excavated soils may be preserved and used as backfill materials at the site of origin. Spoil piles would be placed along the trench in areas where a temporary construction easement is available. Materials deemed unsuitable for backfill would be disposed of off-site and/or transported to Aera Energy's Belridge road-mix facility for reuse in accordance with all applicable regulations.
- **Jack-and-Bore.** Jack-and-bore tunneling would be utilized at road crossings, where required. This methodology is used for horizontal pipeline construction and entails the excavation of pits on either side of the crossing and use of a boring machine with a cutting 'head', auger, and casing. The auger and casing are pushed behind the 'head' as it cuts through the ground. The auger carries the debris back to the pit as the head cuts. Jack-and-bore horizontal tunneling is anticipated to take approximately 10 days to complete at each location. Additional locations may be added based on circumstances that are unknown at this time, such as utility conflicts or requirements imposed by the County or Caltrans. Typical horizontal bores are 10 feet deep and require entry pits of approximately 15 feet by 40 feet and receiving pits of approximately 10 feet by 15 feet. In any location where Jack and Bore is used, there is only one entry pit and one exit pit.
- **Pipe Placement, Welding and Coating.** New underground pipeline segments at locations where the pipeline crosses lease roads would be inspected to locate and repair any faults or voids in the pipeline coating prior to being lowered into the trench. Welding and Coating would apply to all underground areas throughout the project.
- **Weld Inspection.** All welds would be inspected in accordance with state and federal welding requirements. All radiographs would be recorded and interpreted for acceptability in accordance with American Petroleum Institute 1104. All rejected welds would be repaired or replaced as necessary and re-radiographed. The inspection reports would be kept for the life of the pipeline.
- **Line Lowering, Backfill and Compaction.** At designated internal road crossings, the welded pipe segments or individual pipe lengths would be lifted and lowered into the trench by tractors. The native material excavated from the pipeline trench would either be reused as backfill, transported to Aera Energy's Belridge road-mix facility, or would be hauled and disposed off-site to at an approved landfill facility. Required backfill material would be compacted with compaction rollers and/or hydraulic tampers and undergo compaction testing to ensure that all trench locations are compacted in accordance with standard

engineering practices and permit requirements. All trenches would either be fenced, backfilled, or covered with steel plates at the end of each workday.

- **Aboveground Equipment Installation.** The majority of aboveground equipment would be pre-fabricated at a staging area and then transported to the respective locations for final assembly and tie-in to the pipeline facilities. Valve and meter set assembly locations would be either paved or graveled. After installation, all above-grade piping and equipment would be painted and the valve would be enclosed by a chain-link fence.
- **Hydrostatic Testing.** In accordance with the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) standards and SB 905 (2022) requirements, the pipeline would undergo hydrostatic testing prior to operation by pumping water into the test sections, pressurized to design-test pressure, and maintained at that pressure to verify no leaks and for at least the minimum required period. Water to be used for hydrotest shall be from local water systems. Discharged water shall be stored into temporary tanks and held for testing. After results of the samples are analyzed, the water may be used for dust control at the project site or used for additional testing on other pipeline segments. The Storm Water Protection and Prevention Plan prepared by Aera Energy would also include Best Management Practices in case the hydrotest is not successful initially.
- **Pigging.** Pipeline pigs are devices that are inserted into and travel throughout the length of a pipeline driven by a product flow to perform functions, such as cleaning or dewatering and provide information on the condition of the line, as well as the extent and location of any problems. After the pipeline has been hydrostatically tested and dewatered, the contractor would run several utility pigs of various types to remove as much water as possible and any remaining small debris from within the pipeline.
- **Cleanup and Restoration.** All construction material and debris would be removed and disposed of at appropriate landfills or recycled in accordance with applicable law and regulation. Clean up and restoration would be ongoing throughout the project and when an active site is completed, the area shall be restored to surface grade. In upland areas, the right-of-way would be regraded to its approximate pre-construction contour and stabilized or restored to pre-construction conditions, in compliance with all relevant permits. All temporary disturbance areas would be recontoured to pre-construction conditions and would be stabilized or restored in accordance with all relevant permits. All paving repairs would be made in accordance with the current County requirements. As a final step, the route within unpaved portions of the roadway shoulder or private right-of-way would be marked with approximately 5-foot-high pipeline markers placed in accordance with PHMSA standards.
- **Operations and Maintenance.** Maintenance of pipeline and auxiliary facilities would continue to be performed as required by state and federal requirements.

3.5.6 Field Systems Construction

The proposed Project would include the installation of a system of on-site gathering and distribution lines for various co-located services, including produced gas pipelines, and steam distribution.

Intra-Field Pipelines

The field gathering and distribution system would be designed to locate pipeline corridors primarily along existing pipeline corridors on raised pipe supports to minimize external corrosion. The sequence of general construction procedures associated with the installation of intra-field pipelines would be similar to the CO_2 pipeline construction described above and would follow the process listed below:

1. Mobilization and Staging
2. Surveying, Staking and Flagging
3. Clearing and Grading
4. Hauling and Stringing
5. Pipe Placement, Welding, Inspection, and Coating
6. Pipeline Installation and Testing

Intra-Field Electrical Distribution

The intra-field electrical distribution system would be constructed concurrently with injection well drilling, repurposing, and CO_2 capture facility construction. Once poles are erected, the conductor would be strung from conductor pull and tension sites at the end of the power line interconnection alignment moving from one pole to the next. Each conductor would be pulled into place at a pre-calculated sag and then tension-clamped to the end of each insulator. The sheaves and vibration dampers and accessories would be removed once installation is complete.

3.5.7 Electrical Transmission Power Line Construction

As described in Section 3.4.5 Utilities and Communications, Aera Energy would construct, operate, and maintain approximately 1.26-miles of new 115-kV transmission lines to the Aera Energy-owned substations located at the project site. The estimated permanent disturbance of the 115 kV electrical interconnection would be 2 acres with 4 acres of temporary disturbance. To support major construction, electrical connections are anticipated to be in place prior to significant field activities.

Access and Staging Areas for Electrical Transmission Interconnection

Primary access to the power line interconnection sites would be via existing access roads. Construction of the power line interconnection would be completed by the designated contractor. The new wood poles would require approximately 6 to 8 feet of embedment. Construction would involve temporary ground disturbance around each new power pole location (approximately a 50-foot radius) as well as temporary ground disturbance associated with access to each pole location (approximately a 15-foot-wide access route). All new poles and access thereto would be located within existing oilfield production areas or along a dirt road. Pole work areas would likely be located approximately every 400 feet for 115kV lines, and 200 feet for 12kV lines. Where final design allows, power pole work areas would overlap. Final design would determine final power pole locations. Temporary staging and lay down areas may also be needed for the construction of the interconnection facilities but would primarily use existing disturbed/developed areas.

Construction Methodology for Electrical Transmission Interconnection

Substations. Two new substations would be constructed near the proposed CO_2 capture facilities. Each substation would require approximately 1 acre.

Power Line Removal/Construction. As discussed in Section 3-X Electric Transmission Power Line Interconnection, the new 115 kV power lines would be supported by up to 17 wooden poles. The approximately 13,000 feet of new 12kV overhead distribution power lines would be supported by approximately 65 wooden poles.

Pole installation would consist of the following basic steps:

- Deliver new pole at pole site;
- Auger new hole using line truck attachment or hand dig if the line truck cannot access the site;
- Backfill around the pole;
- Install bottom section by line truck, crane;
- Install top section by line truck, crane; and
- Install switches where necessary. There may be several SCADA-operable or other switches at the point of interconnection and elsewhere.

Once poles are erected, conductor would be strung from conductor pull and tension sites at the end of the power line interconnection alignment. The average distance is 4,000 feet between pull and tension sites. Each conductor would be pulled into place at a pre-calculated sag and then tension-clamped to the end of each insulator. The sheaves and vibration dampers and accessories would be removed once installation is complete.

Transmission Power Line construction and substation improvements are anticipated to take approximately six months.

3.6 Operational and Maintenance Activities

All facilities and equipment would be operated, maintained, and inspected in accordance with the applicable regulatory requirements. Upon completion of all construction activities, the project proponent would ensure that the facility would be properly operated and maintained. Records documenting compliance with these requirements would be maintained digitally and would be periodically reviewed by Aera Energy personnel to ensure compliance. In addition, safety and compliance inspections and audits of the facilities are performed on a regular basis by the EPA or other regulatory personnel. The project proponent would develop an operations and maintenance protocol to be implemented throughout the life of the project. The protocol would specify routine maintenance and operation, which typically adheres to the maintenance program developed by the owner/operator. Operations and maintenance personnel would conduct maintenance activities for each of the facilities required by the routine schedule provided by the supplier or as required to keep the equipment in operation. Routine maintenance may include checking and replacing parts for wear and replacing as required, and recording data from data recording chips in anemometers. Operation and maintenance personnel would also inspect access roads, crane pads, and trenched areas regularly and maintain them to ensure minimal erosion.

At full build-out, the operational aspects of the project would require a total of eight to ten personnel.

3.6.1 Monitoring Systems

The well monitoring system would consist of sensors for measuring temperature and pressure on the tubing and the tubing-casing annulus. Data from the sensors would be collected and stored in a SCADA system. Monitored parameters would have high and low alarms that would be activated when a measured parameter is outside its accepted normal operating range. When a critical parameter is met such as high pressure, the well would be shut in by a fail-safe actuated master valve located on the injection skid immediately adjacent to the wellhead. Operating personnel would be notified that an alarm was activated. The cause for the alarm would be investigated to determine what actions are necessary to ensure that the well is safe. If a well is determined to lack mechanical integrity, the EPA would be notified of the alarm and the well would be shut within 24 hours. After any needed repairs or maintenance are conducted, and mechanical integrity has been demonstrated to the satisfaction of the EPA, the well would then be returned to service. Refer to Testing and Monitoring Plan submitted to the EPA as part of the UIC Class VI application (Appendix E-2).

3.6.2 CO_2 Plume and Pressure Front Monitoring

During the operational life of the project and extending for at least 15 years after the cessation of injection, monitoring activities would be conducted to track the growth and movement of the subsurface CO_2 plume and associated pressure, as required by state and federal regulations. These activities may include but would not be limited to injection zone fluid sampling, well logging, surface and near surface leak monitoring, and geophysical surveys. Aera Energy would also utilize one downhole seismometer deployed within a plugged well near the center of the project site to monitor seismicity during the course of the project. Refer to the Testing and Monitoring Plan submitted by Aera Energy as part of the UIC Class VI permit application.

3.6.3 Operational Traffic

During the years of peak project operation, the project is anticipated to generate approximately 25 average daily vehicle trips per day, assuming 10 employees per day and an average trip rate of 2.5 trips per employee. Worker parking on-site would be on project property, using designated areas such as staging areas.

3.6.4 Maintenance

The KCGP Safety Element further outlines protocol that would ensure that the project site is properly maintained. These measures include identifying access and evacuation routes at the project site, clearing dry vegetative cover, limiting potential fuel sources, and designing firebreaks (by at a minimum adhering to the established setback distances). The project would implement all relevant safety measures into the operation and maintenance of the project in order to ensure the safety of employees, visitors, and residents within the vicinity of the project site.

3.6.5 Health and Safety

The proposed project would adhere to all Kern County Improvement Standards to ensure accessibility for emergency vehicles and safe operation during construction or project operation. The proposed project would implement measures for worker safety during construction in accordance with California Division of Occupational Safety and Health regulations, guidance, and other best management practices. The proposed project would have an ERRP (see Section 3.6.9 for further detail). The plan would address potential emergencies including chemical releases, fires, and injuries. All employees would be provided with communication devices, cell phones, or walkie-talkies, to provide aid in the event of an emergency.

To help ensure safety procedures are followed, the proposed project would include safety training for construction workers and operational personnel. This would include both classroom and hands-on training in operating and maintenance procedures, general safety items, and the planned maintenance program. Training would include emergency procedures, fire prevention, and discussion of the location and proper use of emergency equipment. In addition, contact numbers for various local emergency response agencies, including fire, police, and medical services would

be provided, and instruction for communication procedures to report potential health hazards and concerns would be a part of the training.

The proposed project also would include training on procedures to preventing electrical hazards that would reduce the potential for igniting combustible materials. The project also would limit areas where employees can smoke and parking areas for both personal, heavy equipment, and for project operations would be provided over mineral soil, asphalt, or concrete and at a safe distance from dry vegetation.

3.6.6 Materials, Waste Handling, and Storage

Project well drilling, CO_2 capture, and injection operations would utilize hazardous and non-hazardous chemicals typical of an oil production facility. These chemicals include oil products such as gasoline, diesel and road mix; plant chemicals such as corrosion and scale inhibitors, flocculants; field chemicals such as corrosion and scale inhibitors; paints, epoxies, and grouts; lab chemicals; operator, mechanic and welder supplies; caustic import for use at CO_2 capture and water treatment facilities; and others.

Operations would generate multiple waste streams, each of which would be managed in accordance with applicable federal, state, and local laws, regulations, and ordinances.

Hazardous Materials and Wastes

Hazardous Materials

Capturing CO_2 from existing produced gas streams and stationary sources would primarily use an amine liquid solution. CO_2 would be removed using a physical solvent and/or traditional amine absorption or similar process. Amines are classified as hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200. Amines are harmful if swallowed and could cause severe skin burns and eye damage. Refer to Table 3-7 below for a summary of the hazards associated with amine solutions. There are a variety of physical solvents; a likely candidate is Selexol, a proprietary mixture that commonly uses dimethyl ethers of ethylene glycol. These have quite low hazard scores for skin, eye, and respiratory impact.

Table 3-7: General Amine Classifications

Name	Skin Corrosion	Eye Damage	Reproductive Toxicity	Respiratory Sensitization
Amine Solution	1B* (highest risk)	1 (highest risk)	1B (highest risk)	1 (highest risk)

*1B refers to gases which meet the flammability criteria for Category 1 but which are neither pyrophoric nor chemically unstable, and have either a lower flammability limit of more than 6% by volume in air or a fundamental burning velocity of less than 10 centimeters per second.

Capturing CO_2 would also utilize hazardous chemicals typical of oil production, gas processing, and/or power generation facilities. These chemicals include caustic, sulfuric acid, calcium chloride,

triethylene glycol, piperazine, lubricating oil, corrosion inhibitors, scale inhibitors, brominated biocide, sodium hypochlorite, reverse osmosis (RO) dispersant, and citric acid. Many of these chemicals are classified as hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200, and are harmful if swallowed and could cause skin and eye damage. Table 3-8 below shows the planned volume stored, maximum usage, and estimated deliveries per year at each facility for the hazardous chemicals previously listed.

Table 3-8: Capture Facility Chemical Inventory

Name	Volume Stored at Each Facility (bbls)	Maximum Usage at Each Facility (tons/year)	Deliveries Per Year at Each Facility	Delivery Method
Diluted Amine	4,000	N/A	N/A	N/A
Concentrated Amine	500	300	21.4	Bulk, individual delivery
Caustic (50% weight)	500	100	4.8	Bulk, individual delivery
96% Sulfuric Acid	200	150	5.8	Bulk, individual delivery
37% Calcium Chloride	500	500	25.0	Bulk, individual delivery
Triethylene Glycol	300	10	51.9	Individual delivery
Piperazine	200	10	51.9	Individual delivery
Lubricating Oil	10	4	26	Individual delivery
Corrosion inhibitor	10	20	76.1	Common delivery (same truck and trip)
Scale Inhibitor	10	20	76.1	Common delivery (same truck and trip)
Brominated Biocide	10	5	19.0	Common delivery (same truck and trip)
12% Sodium Hypochlorite	10	5	19.0	Common delivery (same truck and trip)
RO Dispersant	10	5	19.0	Common delivery (same truck and trip)
Citric Acid	N/A	2	4.0	Individual delivery

Waste Material

As the waste generator, Aera Energy would determine the toxicity and physical properties of the waste streams generated to determine the proper waste classification and disposal methods in compliance with applicable regulations (for example, California Health and Safety Code, California Code of Regulations [CCR]). Aera Energy has a Waste Management Program (Revised in 2023) that covers all the required aspects of waste classification, tracking, and disposal. Aera Energy will add all waste material to the required California Environmental Reporting System State database along with the required Site Maps and Consolidated Contingency and Emergency Response Plans.

The CO_2 capture process would generally generate result in three types of hazardous waste material:

- Degraded amine

- Carbon filtration media
- Amine filter cartridges

Table 3-9 below shows the estimated waste that would be produced from the project per year.

Table 3-9: Waste from CO_2 Capture

Name	Maximum Volume from Each Facility (tons/year)	Shipments from Each Facility (per year)	Total Maximum Volume (tons/year)	Total Shipments (per year)
Degraded Amine	250	12	1000	48
Carbon Filtration Media	170	9	680	36
Amine Filter Cartridges	400 cartridges per year	2	1,600	8

Wastewater

The capture facilities proposed by the project would yield approximately 800,000 gallons of wastewater per day. The wastewater produced by the project would be piped to existing onsite oilfield produced water infrastructure, which handles approximately 17 million gallons per day.

3.6.7 Injection Well Workovers

After an injection well is completed and operational for some time, it may require a workover. A workover is any operation performed on a well to restore or increase its injection rate. In general, workovers are done to:

- Repair mechanical problems;
- Conduct mechanical integrity testing;
- Remove scaling carbonate deposits that inhibit CO_2 flow; and
- Improve injection rates.

Well servicing (that is, pulling or replacing a tubing and packer) would typically be performed during daytime hours only and would normally take five days per well. A well workover (i.e., well recompletion type work) may occur 24 hours per day, seven days per week depending on the particular job. A workover would typically require 15 days per well.

Well-servicing operations would be conducted primarily by contract services and would include one well servicing rig with a crew of four personnel for well workover and maintenance activities.

3.6.8 Water Demand and Treatment Facility Operations

On average, the CO_2 capture facilities would require up to approximately 1,223 acre-feet per year (afy) (26,000 bbls of water per day) for cooling water makeup and/or process water makeup.

Cooling water makeup would be sourced from produced oilfield water that is currently injected in Class II injection wells. The produced water would be filtered, softened, and distilled in a steam generation process, by existing operating facilities and equipment. After the produced water/steam is used as a heat source for the capture facilities through non-contact heat exchange, it would be condensed and treated in the new water treatment facilities.

New water treatment facilities would be installed with primary treatment functions of activated carbon filtration, and Calcium Chloride buffer addition. The water treatment facilities would also include storage tanks, heat exchangers for heat recovery and cooling, and pumps for conveyance throughout the plant. The treated produced water used in the cooling water system would periodically require blowdown from the cooling tower due to concentration from evaporation, and blowdown water would be piped back to existing water distribution systems and Class II injection wells.

Process water makeup would be sourced from either the cooling water makeup source, with additional RO treatment, or in the case of the post-combustion capture facilities, from water condensed from the flue gas of the oilfield combustion sources. In the post-combustion process, excess water is condensed from the flue gas and is reused as makeup water, after treatment for the primary purpose of removing or neutralizing entrained CO_2. The water is first decarbonated, the remaining CO_2 is neutralized with Sodium Hydroxide, then the water is treated through a RO system. The purified RO stream is used as process makeup water, while the concentrated RO stream is still good quality and used as additional makeup to the cooling water system. The water treatment processes described above would not significantly change the quality of water to Class II injection.

3.6.9 Emergency Management

Monitoring Systems

The well monitoring system would consist of sensors for measuring temperature and pressure on the tubing and the tubing-casing annulus. Data from the sensors would be collected and stored in a SCADA system. Monitored parameters would have high and low alarms that would be activated when a measured parameter is outside its accepted normal operating range. When a critical parameter such as pressure alarms, the well would be shut in by a fail-safe actuated master valve that is a component of the wellhead. Operating personnel would be notified that an alarm was activated. The cause for the alarm would be investigated to determine what actions are necessary to ensure that the well is safe. If a well is determined to lack mechanical integrity, the EPA would be notified of the alarm and the well would be shut within 24 hours. After any needed repairs or maintenance are conducted, and mechanical integrity has been demonstrated to the satisfaction of the EPA, the well would then be returned to service. Refer to Appendix X – Testing and Monitoring Plan.

Personnel and Facility Safety Protocol/Emergency Response

The following plans would be developed for facility operations as required by Federal, State, and County regulatory requirements:

- ERRP
- Hazardous Materials Business Plan
- Fire Safety Plan
- Worker Safety Plan

Emergency and Remedial Response Plan

The project would be governed by an ERRP that describes actions that Aera Energy shall take to address the movement of the injection fluid or formation fluid in a manner that may endanger an USDW during the construction, operation, or post-injection site care periods. If Aera Energy obtains evidence that the injected CO_2 stream and/or associated pressure front may cause an endangerment to a USDW, Aera Energy must perform the following actions:

1. Cease injection
2. Take the steps reasonably necessary to identify and characterize a release
3. Notify the permitting agency (EPA UIC Program Director and CARB Executive Officer) of the emergency event within 24 hours
4. Implement applicable portions of the approved ERRP

Where the phrase "initiate shutdown plan" is used, the following protocol would be employed: Aera Energy would immediately cease injection. However, in some circumstances, Aera Energy will, in consultation with the UIC Program Director, determine whether gradual cessation of injection (using the parameters set forth in Class VI Permit is appropriate.

Site Security

Public access to the project site is limited because the main point of access is located at the private Oasis Road along 7th Standard Road, west of SR 33. The main point of access is the main entrance to the South Belridge oilfield, which is only available for construction, operational, and emergency vehicle access. Security fences would be installed around each injection well, CO_2 measurement bullpens at each capture facility, CO_2 vent stacks at each capture facility, electrical substations, the booster station, and possibly at the four capture facilities. The security fencing would consist of 6-foot-tall chain-link fencing, possibly with barbed wire across the top. Additionally, the project site is heavily surveilled and occupied by personnel. The project site holds 24/7 operations and would always have facility personnel occupying and monitoring the project site.

3.7 Decommissioning

3.7.1 General Decommissioning Procedures

Based on current projections, Aera Energy estimates that the project would span approximately 20 years. Once Aera Energy determines that its use of the Belridge properties as a carbon sequestering facility has ended, Aera Energy would make a determination as to divesture or decommissioning of the project site facilities and wells. Surface and subsurface abandonment activities would begin after all applicable permits and notifications are completed. Decommissioning of the CCS facilities is similar to the decommissioning of oilfield properties:

1. Shut down and bleed down of facilities and pipelines
2. Removal of residual oil, gas, water and other liquids from tanks, pipelines, and vessels
3. Plugging and abandonment of wells
4. Removal of surface equipment at well sites
5. Isolation and removal of utility systems (water, electrical service)
6. Demolition and removal of intra-facility pipelines, tanks, vessels, and other equipment
7. Demolition and removal of concrete foundations and slabs
8. Regrading and reseeding of facility and infrastructure areas

Permits would be required for decommissioning activities from the Kern County and other regulatory agencies as needed, including the EPA, Central Valley Regional Water Quality Control Board (RWQCB), CDFW, CalGEM, and the San Joaquin Valley APCD.

3.7.2 Well Abandonment Process

Aera Energy complies with CalGEM requirements for oil well abandonment and would comply with EPA requirements for Class VI injection well plugging under 40 CFR 146.92. CalGEM determines the requirements and supervises oil well plugging and abandonment, outlined in California Public Resources Code § 3008. General well abandonment procedures include isolating all oil-bearing strata encountered in the well, plugging the well, and decommissioning the attendant production facilities of the well. Aera Energy would comply with EPA requirements for injection well abandonment – as detailed in the Injection Well Plugging Plan (Appendix E-2).

General well abandonment procedures would be a part of that developed process:

1. Notify EPA at least 60 days prior to plugging the well and provide updated Injection Well Plugging Plan

2. Remove well equipment from location
3. Move in subsurface equipment
4. Perform pre-cementing operations, kill the well, conduct pre-abandonment tests if required by regulations, and remove downhole equipment
5. Clean out wellbore to total depth
6. The following plugging operations would be performed by utilizing a coiled tubing unit: Run in the hole to total depth and begin placing cement inside of the casing. Once the full plug is placed, the coiled tubing is pulled above the plug and the well is circulated to ensure the depth of the top of the plug. The tubing is then pulled up-hole while operations are paused to wait for the cement plug to set. Once the cement has set, the coiled tubing is run back in the hole to witness the depth and hardness of the plug before initiating the next cemented plug interval. This process is repeated until cement is placed to surface.
7. In repurposed injection wells, the casing would be perforated, where necessary, and cement would be squeezed outside of the casing to ensure a sound connection is made between casing annuli and with the borehole wall. Top off cement with surface crew, if necessary.
8. The casing and all annuli would be plugged at the surface with at least a 25-foot cement plug
9. Cut off well head 5 feet below grade
10. Weld metal plate with ending five digits of API number on top of cemented well head
11. Restore location to original grade

Long Term Site Monitoring

Following the 15-year post-injection monitoring period, a CO_2 leak detection strategy would be implemented to monitor the site for an additional 85 years, or until 100-years after cessation of injection, as required by state regulations. CO_2 leak detection monitoring may involve ground-based inspections or remote sensing methods conducted annually until the plume has stabilized and then at a frequency once every 5 years.

3.8 Entitlements Required

The Kern County Planning and Natural Resources Department as the Lead Agency (according to CEQA Guidelines Section 15052) for the proposed project has staff responsibility for the preparation of this EIR and recommendations to the decision makers on the proposed project. To implement this project, the project proponent may need to obtain discretionary and ministerial permits/approvals including the following:

- EPA UIC – Class VI Permit
- U.S. Fish and Wildlife Service Section 10 Incidental Take Permit and Habitat Conservation Plan (if required)

State

- California Department of Fish and Wildlife
- Section 2081 Permit (State-listed endangered species) (if required)
- 401 Water Quality Certification – Central Valley RWQCB
- Waste Discharge Requirements – Central Valley RWQCB
- National Pollution Discharge Elimination System Construction
- State Fire Marshal Approval of CO_2 Pipeline
- California Geologic Management – California DOC CARB
- DOC
- Permit for Transport of Oversized Loads (if required)

Local

- Certification of Final EIR
- Adoption of 15091 Findings of Fact and 15093 Statement of Overriding Considerations Adoption of Mitigation Monitoring and Reporting Program
- Approval of Zone Changes
- Approval of CUPs
- Approval of Kern County Building Permits
- Approval of Kern County Encroachment Permits (if required)
- San Joaquin Valley Air Pollution Control District
    - Approval of Fugitive Dust Control Plan
    - Authority to Construct

3.9 Cumulative Projects

CEQA requires that an EIR evaluate a project's cumulative impacts. Cumulative impacts are the project's impacts combined with the impacts of other related past, present and reasonably foreseeable future projects. As set forth in the CEQA Guidelines, the discussion of cumulative

impacts must reflect the severity of the impacts, as well as the likelihood of their occurrence; however, the discussion need not be as detailed as the discussion of environmental impacts attributable to the project alone. As stated in CEQA, Public Resources Code, Section 21083(b) (2), "a project may have a significant effect on the environment if the possible effects of a project are individually limited but cumulatively considerable."

According to the CEQA Guidelines:

Cumulative impacts refer to two or more individual effects, which, when considered together, are considerable and which compound or increase other environmental impacts.

(a) The individual effects may be changes resulting from a single project or a number of separate projects.

(b) The cumulative impact from several projects is the change in the environment, which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (CCR, Title 14, Division 6, Chapter 3, §15355).

In addition, as stated in the CEQA Guidelines, it should be noted that:

The mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable (CCR, Title 14, Division 6, Chapter 3, Section 15064[I][5]).

Cumulative impact discussions for each environmental topic area are provided at the end of each technical analysis contained within Chapter 4, under "Impacts and Mitigation Measures." As stated, and as set forth in the CEQA Guidelines, related projects consist of "closely related past, present, and reasonably foreseeable probable future projects that would likely result in similar impacts and are located in the same geographic area" (CCR, Title 14, Division 6, Chapter 3, Section 15355).

Cumulative projects are shown in Table 3-10.

Table 3-10: Cumulative Projects

Name	Project Location	Project	Zone Map	Section/ Township/ Range	Approx Acreages	Status
Salt Creek Carbon Capture and Storage	West Lokern Road and Lost Hills Road	CCS	96	Multiple	4,000	Application incomplete
CarbonFrontier Capture and Storage	Lerdo Hwy and SR 33	CCS	51/74/75	Multiple	12,728	EIR in Process
Eastridge Carbon Capture and Storage Project	China Grade Loop and Round Mountain Road	CCS	Multiple	Multiple	7,343	EIR in Process

Table 3-10: Cumulative Projects

Name	Project Location	Project	Zone Map	Section/ Township/ Range	Approx Acreages	Status
Pond Road Biomass Carbon Removal and Storage Project	SR 99 and Pond Road	CCS	9-25	25/25S/25E	118	Application incomplete
Avnos, Inc	Unknown (Elk Hills)	Direct Air Capture w/ CCS	Unknown	Unknown	20	Not submitted – media PR
Lone Cypress Energy Services	Elk Hills Road and Skyline Road	Blue Hydrogen Project	112	35/30S/23E	28	Application withdrawn
Oil and Gas Development under Kern County Oil and Gas Development	San Joaquin Valley Floor portion of Kern County	Revisions to Title 19 of the Kern County Zoning Ordinance	Multiple	Multiple	Multiple	Second Supplemental Recirculated EIR in process
Crimson Resource Management Oil and Gas CUP	West of I-5, North SR 46, and East of Holloway Road	CUP Oil and Gas Extraction	4	34 and 35/25S/20E	800	Application incomplete
AERA Energy Oil and Gas CUP	Seventh Standard Road and SR 33	CUP Oil and Gas Extraction	74/75/96	Multiple	650	EIR in process
CRC Oil and Gas CUP – Buena Vista	SR 119 and Midway Road	CUP Oil and Gas Extraction	Multiple	Multiple	23,167	Application incomplete
CRC Oil and Gas CUP – Elk Hills	Skyline Road and SR 119	CUP Oil and Gas Extraction	Multiple	Multiple	54,196	Application incomplete
CRC Oil and Gas CUP – Kern Front	SR 65 to the West, Southwest by James Road, and on the East by Granit Road	CUP Oil and Gas Extraction	81	Multiple	4,168	Application incomplete
InEnTec (collaboration with CRC)	Unknown (Elk Hills)	Renewable dimethyl either with CCS	Unknown	Unknown	Unknown	Not submitted - media PR
Verde Clean Fuels (collaboration with CRC)	Unknown (Elk Hills)	Renewable fuel - Agricultural Waste/CCS	Unknown	Unknown	Unknown	Not submitted - media PR
NLC Energy LLC	Unknown (Elk Hills)	Waste to Energy (CCS)	Unknown	Unknown	Unknown	Not submitted - media PR
CTV Clean Energy Park	Unknown (Elk Hills)	Multiple Projects	Unknown	Unknown	Unknown	Not submitted - media PR

Table 3-10: Cumulative Projects

Name	Project Location	Project	Zone Map	Section/ Township/ Range	Approx Acreages	Status
Coles Levee Carbon Capture and Storage Project (CRC)	Unknown (North and South Coles Levee Oilfield	CCS	Unknown	Unknown	Unknown	Not submitted - media PR
Kern Store Carbon Capture and Storage Project (CRC)	Unknown (North and South Coles Levee Oilfield, Elk Hills Oilfield	CCS	Unknown	Unknown	Unknown	Not submitted - media PR
A2 Place Carbon Capture and Storage Project (CRC)	Unknown (North and South Coles Levee Oilfield, Elk Hills Oilfield	CCS	Unknown	Unknown	Unknown	Not submitted - media PR
Capture of Existing Oilfield Steam Generators	Unknown	Carbon Capture and Transport for Storage	Unknown	Unknown	Unknown	Not submitted - media PR
Existing Gas Power Plants (two)	Unknown	Carbon Capture and Transport for Storage	Unknown	Unknown	Unknown	Not submitted - media PR
Direct Air Capture	Unknown (Elk Hills)	Direct Air Capture with CCS	Unknown	Unknown	Unknown	Not submitted - media PR

Key:
CCS = carbon capture and storage
CUP = Conditional Use Permit
EIR = environmental impact report
I-5 = Interstate 5
PR = press release
SR = State Route

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Chapter 4

Environmental Setting, Impacts, and Mitigation Measures

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Section 4.1

Aesthetics

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Section 4.1
Aesthetics

4.1.1 Introduction

This section of the Environmental Impact Report (EIR) describes the affected environment and regulatory setting for aesthetics and visual resources. It also describes the impacts on aesthetics and visual resources that would result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers [km]) southwest of the community of Lost Hills and west of State Route (SR) 33

Degradation of the visual character of a site is usually addressed through a qualitative evaluation of the changes to the aesthetic characteristics of the existing environment and the project-related modifications that would alter the visual setting. The evaluation of impacts to aesthetic resources in this section considers whether the project would directly or indirectly affect a protected resource and the existing visual character or quality of public views at the project footprint and its surroundings.

Aesthetics, as addressed in the California Environmental Quality Act (CEQA), refers to visual considerations in the physical environment. Because a person's reaction and attachment to a given viewshed are subjective, visual changes inherently affect viewers differently. Accordingly, aesthetics analysis, or visual resource analysis, is a systematic process to logically assess visible change in the physical environment and the anticipated viewer response to that change. The Aesthetics section of this EIR describes the existing landscape character of the project site, existing views of the area from various on-the-ground vantage points, the visual characteristics of the proposed project, and the landscape changes that would be associated with the project, as seen from various vantage points.

The analysis in this section is based on the Kern County (County) Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting, certified on November 9, 2015), supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022, (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

A description of the environmental setting (affected environment) for aesthetics and visual resources is presented in Section 4.1.2, *Environmental Setting*, including discussion of the regional and local character, including state scenic highways within the vicinity of the project site and existing sources of light and glare. The regulatory setting applicable to aesthetics and visual resources is presented in Section 4.1.3, *Regulatory Setting*, and Section 4.1.4, *Impacts and Mitigation Measures*, discusses project impacts and associated mitigation measures.

Visual Concepts and Terminology

When viewing the same landscape, people may have different responses to that landscape and any proposed visual changes based upon their values, familiarity, concern, or expectations for that landscape and its scenic quality. Because each person's attachment to and value for a particular landscape is unique, visual changes to that landscape inherently affect viewers differently. However, generalizations can be made about viewer sensitivity to scenic quality and visual changes. Recreational users (for example, hikers, equestrians, tourists, and people driving and cycling for pleasure) are expected to have high concern for scenery and landscape character. People who are commuting daily through the same landscape generally have a moderate concern for scenery, while people working at industrial sites generally have a lower concern for scenic quality or changes to existing landscape character. The visual sensitivity of a landscape is also affected by the viewing distances at which it is seen, such as closeup or far away. In addition, the visual sensitivity of a landscape is affected by the travel speed at which a person is viewing the landscape (high speeds on a highway, low speeds on a hiking or cycling trail, or stationary at a residence). Visual or aesthetic resources are generally defined as both the natural and built features of the landscape that contribute to the public's experience and appreciation of the environment. Depending on the extent to which a project's presence would alter the perceived visual character and quality of the environment, a visual or aesthetic impact may occur.

The following terms and concepts are used in the discussion below to describe and assess the aesthetics setting and impacts from the project:

- **Visual (Sensitive) Receptor**: Any scenic vista, designated scenic highway, residence, or public recreational area located within the project viewshed that provides people with views of a site.
- **Scenic Highway:** Any stretch of public roadway that is designated as a scenic corridor by a federal, state, or local agency.
- **Scenic Vista:** An area that is designated, signed, and accessible to the public for the express purposes of viewing and sightseeing. This includes any such areas designated by a federal, state, or local agency. Scenic vistas can also include an area that is designated, signed, and accessible to the public for the express purposes of viewing and sightseeing.
- **Viewshed**: The viewshed for a project is defined as the surrounding geographic area from which the project is likely to be seen, based on topography, atmospheric conditions, land use patterns, and roadway orientations. "Project viewshed" is used to describe the area

surrounding a project site where a person standing on the ground or driving a vehicle can view the project site.

- **Vividness:** The visual power or memorability of landscape components as they combine in distinctive visual patterns.
- **Intactness**: The memorability of the visual impression received from contrasting landscape elements as they combine to form a striking and distinctive visual pattern.
- **Unity:** The degree to which the visual resources of the landscape join to form a coherent, harmonious visual pattern. Unity refers to the compositional harmony or compatibility between landscape elements.
- **Visual Sensitivity:** When viewing the same landscape, people may have different responses to that landscape and any proposed visual changes based upon their values, familiarity, concern, or expectations for that landscape and its scenic quality. Because each person's attachment to and value for a particular landscape is unique, visual changes to that landscape inherently affect viewers differently. However, generalizations can be made about viewer sensitivity to scenic quality and visual changes.
- Recreational users (hikers, equestrians, tourists, and people driving and cycling for pleasure) are expected to have high concern for scenery and landscape character. People who are commuting daily through the same landscape generally have a moderate concern for scenery, while people working at industrial sites generally have a lower concern for scenic quality or changes to existing landscape character.
- The visual sensitivity of a landscape is also affected by the viewing distances at which it is seen, such as closeup or far away. In addition, the visual sensitivity of a landscape is affected by the travel speed at which a person is viewing the landscape (high speeds on a highway, low speeds on a hiking or cycling trail, or stationary at a residence). Visual or aesthetic resources are generally defined as both the natural and built features of the landscape that contribute to the public's experience and appreciation of the environment. Depending on the extent to which a project's presence would alter the perceived visual character and quality of the environment, a visual or aesthetic impact may occur.

4.1.2 Environmental Setting

Regional Character

Kern County is geographically California's third largest county, encompassing 8,202 square miles at the southern end of the Central Valley. The project area is in the western portion of the County and encompasses approximately 12,362 acres within the Belridge oilfields in the San Joaquin Valley of unincorporated Kern County.

The Kern County General Plan (KCGP) describes the San Joaquin Valley region as "the southern San Joaquin Valley below an elevation of 1,000 feet mean sea level" within the County. The San Joaquin Valley portion is characterized by relatively low rainfall, averaging less than 10 inches per

year. Average temperatures are relatively high, and total evaporation exceeds total precipitation. Summers are relatively cloudless, hot, and dry. Winter is generally mild, but an occasional freeze does occur and may cause substantial agricultural damage. The average length of the growing season is 265 days. The San Joaquin Valley region is within the Tulare Lake Groundwater Basin, which includes the Kern River Hydrographic Unit and the Poso Hydrographic Unit.

Most of the terrain within the region is flat to gently rolling with some hilly and steeply rolling terrain near the west, south, and east. The central part of the region is mostly flat and contains a variety of wetlands with natural vegetation. Several stream corridors that descend into the valley from the east, including the Kern River, also contain natural riparian vegetation. However, most of the region consists of diverse agricultural croplands, orchards, and grazing lands, or oil and gas development, and oil and gas facilities are often interspersed in the agricultural areas. In the more urbanized portions of the region, a combination of residential, commercial, and industrial scenes dominates the views, with smaller amounts of recreational, open space, and other typical urban structures and activities. Urban land uses and associated views occur in a small portion (approximately 2 percent) of the overall region. Outside of the urbanized areas, the predominant land uses and associated views are agricultural, oil and gas-related uses, and recreational and other open space. Within agricultural lands, views include irrigated and non-irrigated lands, row crops and orchards, rangeland, and support and processing facilities. Views of agricultural lands are considered an important attribute of the County's visual character and quality. Areas with existing oil and gas development likewise can include a variety of land disturbance, facilities, uses, and intensities, with corresponding views. Generally, these oil and gas land uses within the region are not considered to contain unique aesthetic features or scenic vistas. The existing regional visual environment is shown in Figure 4.1-1 through Figure 4.1-6 from the perspective of potential regional key observation points (KOPs). Views from these KOPs do not show the project site or its immediate area but do provide baseline context for regional character.

Local Character

The project site is located within the Central Valley portion of unincorporated Kern County and is comprised of forty-five parcels within the administrative boundaries of the Belridge oilfields. The Belridge oilfields are contiguous and located west of SR 33, approximately 7 miles southwest of the community of Lost Hills (population 2,370). Together, the two Belridge oilfields cover an area of approximately 13 miles long and 3 miles wide. Aera Energy is the primary operator within both oilfields.

The main entrance to the South Belridge oilfield is located at Oasis Road, a private road that is not open to the public without permission. Primary access to the project site would be from Oasis Road, accessed from Seventh Standard Road, west of SR 33. Main Camp Road also provides access to the site and is also a private road that is not open to the public without permission. The Belridge oilfields can also be accessed from a series of entrances along the west side of SR 33. These main access points connect to a network of existing dirt roads within the field.

SR 33 bounds the project to the east, Shale Hills and Antelope Hills to the north, and Bacon Hills leading into the Temblor Mountain Range to the west. Numerous steep draws and dry stream

channels characterize the site. Alluvial plains and flat valley lands occur around the perimeter of the reserves. Elevations are lowest in South Belridge at 440 feet and gradually increase from east to west. Elevations are highest in North Belridge at 740 feet (Kern County 2024).

The Belridge oilfields are heavily developed with oil wells and associated infrastructure. As such, there are no unique aesthetic features or identified scenic vistas on or near the project site or its vicinity. Figures 4.1-7 through 4.1-10 show views of the project site from the surrounding access roadways, which are private and closed to the public without permission.

State Scenic Highways

Regional access to Belridge oilfields is via highways that traverse the area, including SR 33, 58, and 46. According to the California Department of Transportation (Caltrans) California Scenic Highway Mapping System, there are no Designated State Scenic Highways or scenic resources near or on the project site (Caltrans 2019). One Eligible State Scenic Highway section, SR41 is located approximately 27 miles northwest of the project site and, therefore, is not within viewing distance of the project site (Caltrans 2019). Portions of the project site that are currently dominated by oil and gas production facilities and associated infrastructure may be visible from public roads, such as Seventh Standard Road and SR 33.

Lighting Environment

Light and Glare

Lighting effects are associated with the use of artificial light during the evening and nighttime hours. Existing sources of light and glare occur throughout the project site as part of existing oil and gas facilities. Glare is reflective light that can be visually unpleasant or possibly unsafe due to the potential for temporary blindness. Glare is primarily a daytime occurrence that may be caused by light from artificial sources or the sun reflecting off of light-colored or smooth, highly polished surfaces, such as metal, glass, water, or polished stone. Glare intensity varies depending on the source and intensity of the light, time of day, time of year, angle of reflectance, weather, atmospheric conditions, the reflectivity, color, and texture of material surface finish, length of exposure, nature and sensitivity of receptors, and other factors.

The Belridge oilfields are currently being used for oil and gas production. Developed portions are occupied by oil and gas production facilities and infrastructure, such as dirt roads, well pads, wells, pipelines, and production equipment. There are no existing light poles along roads that extend from Seventh Standard Road to within the Belridge oilfields. Because the majority of the area surrounding the project is vacant, there are no substantial light sources in the immediate vicinity. Additionally, because the surrounding areas are used for agriculture and industrial uses, no sensitive light receptors are located near the proposed project. The sensitive receptor closest to the proposed project site is a small housing tract on Lost Hills Road, north of Lerdo Highway, roughly 3 miles east of the proposed project site. The community of Lost Hills is located 7 miles northeast of the proposed project site. Lost Hills Wonderful Park, a local park, is located approximately 7 miles northeast of the nearest injection well.

4.1.3 Regulatory Setting

This section describes the federal, state, and local statutes, ordinances, or policies that govern the light, glare, viewshed, and scenic character that must be considered by the County during the decision-making process for projects that have the potential to affect aesthetics.

Federal

U.S. Department of Agriculture, Forest Service

The National Trails System Act (NTSA) of 1969 seeks to preserve scenic and natural qualities along trails and recognizes the rights of private landowners and provides that "full consideration shall be given to minimizing the adverse effects upon the adjacent landowner or user and his operation" in the development and use of a trail (NPS 2019). The NTSA assigns management responsibility for trails to various federal resource agencies, depending on which agency holds jurisdiction over the public lands on which the trail is located in a given area (for example, U.S. Forest Service, National Park Service, or the Bureau of Land Management).

The Pacific Crest Trail was created under the NTSA to provide for outdoor recreation opportunities and the conservation of significant scenic, historic, natural, or cultural qualities. The Pacific Crest Trail stretches 2,650 miles from Mexico to Canada through California, Oregon, and Washington and is designated in the KCGP as a scenic feature. The U.S. Forest Service administers the Pacific Crest Trail in the vicinity of the project. The Pacific Crest Trail is located approximately 80 miles from the project area at its closest point. Therefore, project compliance with the NTSA was not considered in this analysis, and no regulations would be applicable for development of carbon capture and storage (CCS) facilities in the project area because the project area would not be visible from the Pacific Crest Trail.

State

California Scenic Highway Program

The California's Scenic Highway Program was created by the State Legislature in 1963 (Caltrans 2024). The purpose of this program is to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways. The state laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq. Caltrans manages the State Scenic Highway Program, provides guidance, and assists local government agencies, community organizations, and citizens with the process to officially designate scenic highways.

Figure 4.1-1: Photo Locations for Regional Views from KOPs

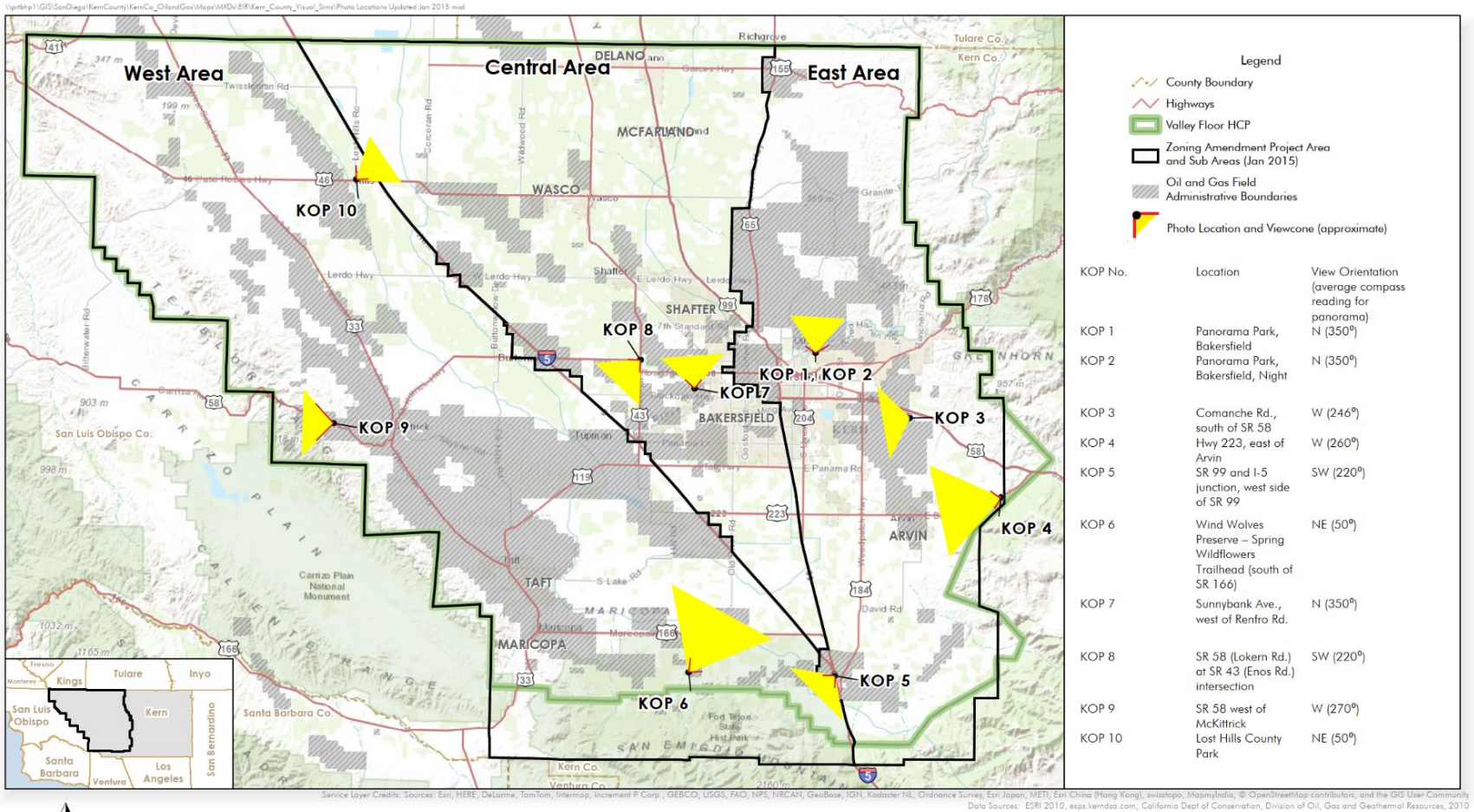
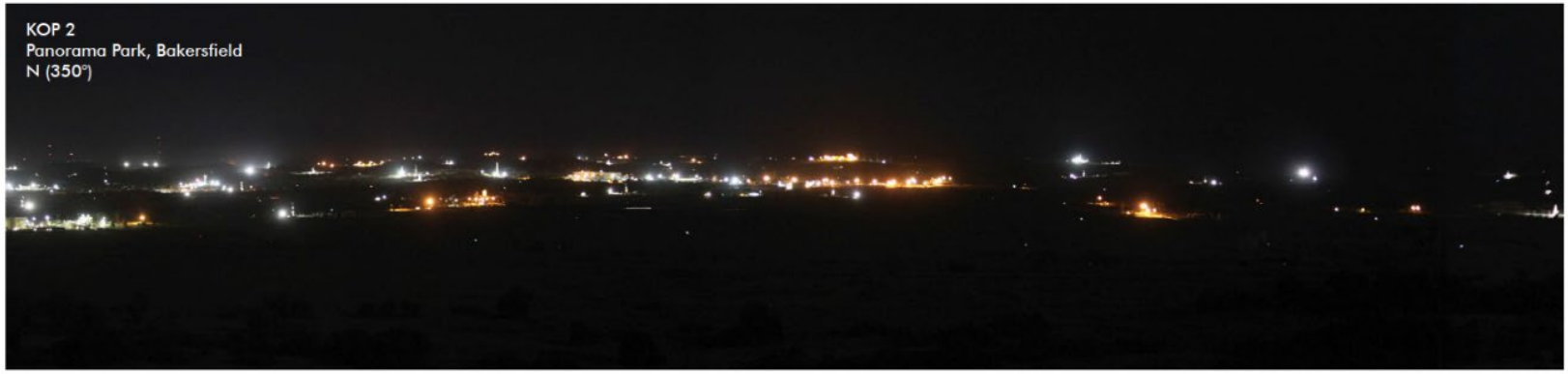


Figure 4.1-1
Photo Locations

Figure 4.1-2 Photo Locations, Existing Regional Views for KOPs 1 and 2

View looking north from Panorama Park in north Bakersfield toward the existing oil and gas development fields. This KOP represe nts day-time views for park visitors.



Night-time view looking north from Panorama Park in north Bakersfield toward the existing oil and gas development fields. This KOP represents night-time views for park visitors.

Figure 4.1-2
Existing Views for KOP 1 and KOP 2

Photo Locations

Figure 4.1-3: Photo Locations, Existing Regional Views for KOPs 5 and 6

View looking west from Comanche Road south of SR 58 in the eastern part of the Project Boundary Area. This KOP represents typi cal views of agricultural lands with some scattered oil and gas facilities.

View looking west from an overlook along Highway 223 east of the community of Arvin in the eastern portion of the Project Boundary Area. This KOP represents views for motorists and others traveling westbound on Highway 223 and descending into the San Joaquin Valley through the foothills of the southern Sierra Nevada.

Figure 4.1-3
Existing Views for KOP 3 and KOP 4

Photo Locations

Figure 4.1-4: Photo Locations, Existing Regional Views for KOPs 5 and 6

View looking southwest near the junction of SR 99 and I-5 in the southern portion of the Project Boundary Area. This KOP is lo cated on a frontage road adjacent to and just west of SR 99 and represents views for motorists and others travelling southbound on SR 99 and I-5.

View looking northeast from the Spring Wildflowers Trailhead in the Wind Wolves Preserve in the southern portion of the Proje t Boundary Area. This KOP represents views across the southern San Joaquin Valley for visitors to the open space preserve.

Figure 4.1-4
Existing Views for KOP 5 and KOP 6

Photo Locations

Figure 4.1-5: Photo Locations, Existing Regional Views for KOPs 7 and 8

View looking north from Sunnybank Avenue, west of Renfro Road, in the central portion of the Project Boundary Area west of theCity of Bakersfield. This KOP represents views within predominantly residential areas where oil and gas facilities occur in close proximity to residences.

View looking southwest from the intersection of SR 58 (Lokern Road) and SR 43 (Enos Road) in the central portion of the Proje ct Boundary Area west of the City of Bakersfield. This KOP represents typical views of agricultural lands with scattered rural residences and some oil and gas facilities.

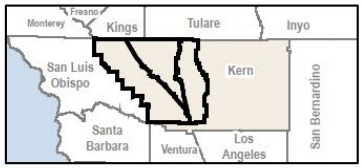


Figure 4.1-5
Existing Views for KOP 7 and KOP 8

Photo Locations

Figure 4.1-6: Photo Locations, Existing Regional Views for KOPs 9 and 10

View looking west along SR 58 in the western portion of the Project Boundary Area. This KOP represents views for motorists and others travelling westbound on SR 58 toward the Carrizo Plain and Central Coast region in San Luis Obispo County.

View looking northeast from Lost Hills County Park near the edge of the small community of Lost Hills in the northwestern portion of the Project Boundary Area. This KOP represents typical views of open lands within this general area.

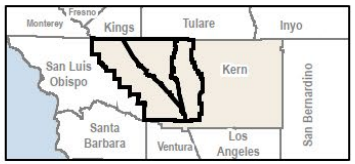


Figure 4.1-6
Existing Views for KOP 9 and KOP 10

Photo Locations

Figure 4.1-7: Existing View of Project Site Main Entrance off 7th Standard Road

Figure 4.1-8: Existing View of Project Site Entrance B

Figure 4.1-9: Existing View of Project Site Entrance F from Hwy 33

Figure 4.1-10: Existing View of Project Site Entrance G

A highway may be designated as scenic depending upon how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. The California Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. The status of a state scenic highway changes from eligible to officially designated when the local jurisdiction adopts a scenic corridor protection program, applies to Caltrans for scenic highway approval, and receives notification from Caltrans that the highway has been designated as a scenic highway (Caltrans 2024).

Several highways and state routes are located within the region that provide access to the project site, but the project site is not in proximity to any Designated State Scenic Highways or scenic resources. The nearest section of any State Scenic Highway is 27 miles away.

Kern County

Kern County General Plan

The project site is located within the KCGP area and, therefore, would be subject to applicable policies and measures of the KCGP. The Land Use, Conservation, and Open Space Element; the Circulation Element; and the Energy Element of the KCGP include goals, policies, and implementation measures related to aesthetics that apply to the project, as described below.

The Land Use, Conservation, and Open Space Element of the KCGP evaluates the visual and aesthetic setting of Kern County and assesses the potential for visual impacts. The KCGP Circulation Element provides guidelines for development near scenic routes. A scenic route is defined in the KCGP as any freeway, highway, road, or other public right-of-way that traverses an area of exceptional scenic quality. A roadway can only be designated as a scenic route by direct action of the County Board of Supervisors or the State of California. A route may not be selected as scenic until a visual assessment has been conducted to determine if the route meets the current scenic highway criteria as mentioned above, and to what extent development has encroached on the scenic views. In addition, the County must prepare and adopt a plan and program for the protection and enhancement of adjacent roadside viewshed land. No scenic routes have been designated in the project site.

Chapter 1. Land Use, Conservation, and Open Space Element

1.10.7. Light and Glare

Policies

Policy 47. Ensure that light and glare from discretionary new development projects are minimized in rural as well as urban areas.

Policy 48. Encourage the use of low-glare lighting to minimize nighttime glare effects on neighboring properties.

Implementation Measures

Implementation Measure AA. The County shall utilize California Environmental Quality Act Guidelines and the provisions of the Zoning Ordinance to minimize the impacts of light and glare on adjacent properties and in rural undeveloped areas.

Chapter 2. Circulation Element

2.3.9. Scenic Route Corridors

None of the goals, policies, or implementation measures contained in Section 2.3.9 are applicable to the proposed project.

Kern County Zoning Ordinance

Chapter 19.81, Outdoor Lighting "Dark Skies Ordinance "

Chapter 19.81 of the Kern County Zoning Ordinance implements requirements for outdoor lighting unincorporated areas of Kern County in order to accomplish the following objectives:

1. Encourage a safe, secure, and less light-oriented nighttime environment for residents, businesses, and visitors.
2. Promote a reduction in unnecessary light intensity and glare, and to reduce light spillover onto adjacent properties.
3. Protect the ability to view the night sky by restricting unnecessary upward projections of light.
4. Promote energy conservation and a reduction in the generation of greenhouse gases by reducing wasted electricity that can result from excessive or unwanted outdoor lighting.

Kern County Development Standards

The Kern County Development Standards have specific regulations pertaining to lighting standards, including the requirement that lighting must be designed so that light is reflected away from surrounding land uses so as not to affect or interfere with vehicular traffic, pedestrians, or adjacent properties.

Kern County Specific Plans

Kern County has adopted 24 Specific Plans. These Specific Plans are intended to be an amplification of the goals and policies of the KCGP and are, therefore, consistent therewith. The project site is not located wholly or partially within any adopted Specific Plan areas.

4.1.4 Impacts and Mitigation Measures

This section describes the impact analysis relating to aesthetics and visual resources for the proposed project. It describes the methods used to determine the impacts of the project and lists the

thresholds used to conclude whether an impact would be significant. Measures to mitigate (that is, avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion, where applicable.

Methodology

In general, the potential character, quality, light, and glare impacts associated with projects are evaluated on a qualitative basis. The potential impacts to aesthetics and visual resources within the vicinity of the project site were qualitatively evaluated based on the following criteria:

- Existing visual quality and scenic attributes of the landscape
- Location of sensitive receptors in the landscape
- Assumptions about receptors' concern for scenery and sensitivity to changes in the landscape
- Magnitude of visual changes in the landscape that would be brought about by implementation, construction, and operation of the proposed project
- Compliance with State, County, and local policies for visual resources
- Significance threshold questions in relation to aesthetics contained in Appendix G of Kern County's CEQA Implementation Document and Environmental Checklist

Visual Characteristics

As stated in the Environmental Setting section, this project is located entirely within Belridge oilfields, which is an area heavily developed with oil wells and associated infrastructure. While the aesthetic features of the existing visual environment in the area are varied, agricultural and oil production/extraction equipment dominate the landscape. See Figure 4.1-11 through Figure 4.1-14 for photos of some of the existing facilities. Figure 4.1-15 shows the current condition of one of the proposed CO_2 capture locations. The project elements that would be introduced are similar looking to the existing features and are shown in Figure 4.1-16 through Figure 4.1-17. These elements represent those that would be introduced as part of the proposed project and are consistent with existing conditions, and existing conditions of other typical oilfields within the project's vicinity.

Sensitive Viewers

Viewer sensitivity or concern is based on the visibility of resources in the landscape, the proximity of viewers to visual resources, the elevational position of viewers relative to visual resources, the frequency and duration of views, the number of viewers, and the type of expectations of individuals and viewer groups. The project footprint is confined to an existing oilfield with minimal public visibility due to the lack of public access to the area. The volume, frequency, and duration of views of the proposed project would be low and viewers primarily would be people driving to and from work or as part of their work who would not perceive any additional concern regarding the scenery or have a sensitivity to the changes in the landscape as a result of this project. Additionally, there

are no scenic vistas. The closest sensitive receptor is a property at 17059 West Side Highway, Lost Hills, California located approximately 0.6 miles away from the booster station and approximately 400 feet east of the project boundary. The second closest sensitive receptors to the project site are two small housing tracts (consisting of about 28 homes) on Lost Hills Road, north of Lerdo Highway, roughly 3.5 miles east of the project site, including one residence located at 17863 Lost Hills Road, McKittrick, California, which is 3.12 miles from the nearest CO_2 capture facility. The community of Lost Hills is 6 miles northeast of the project site. Lost Hills Wonderful Park, a local park, is located approximately seven miles northeast of the nearest injection well.

Photos of Existing Conditions

Figure 4.1-11: Existing View of Cogen 32

Figure 4.1-12: Existing View of GP 32

Figure 4.1-13: Existing View of SGS 2868

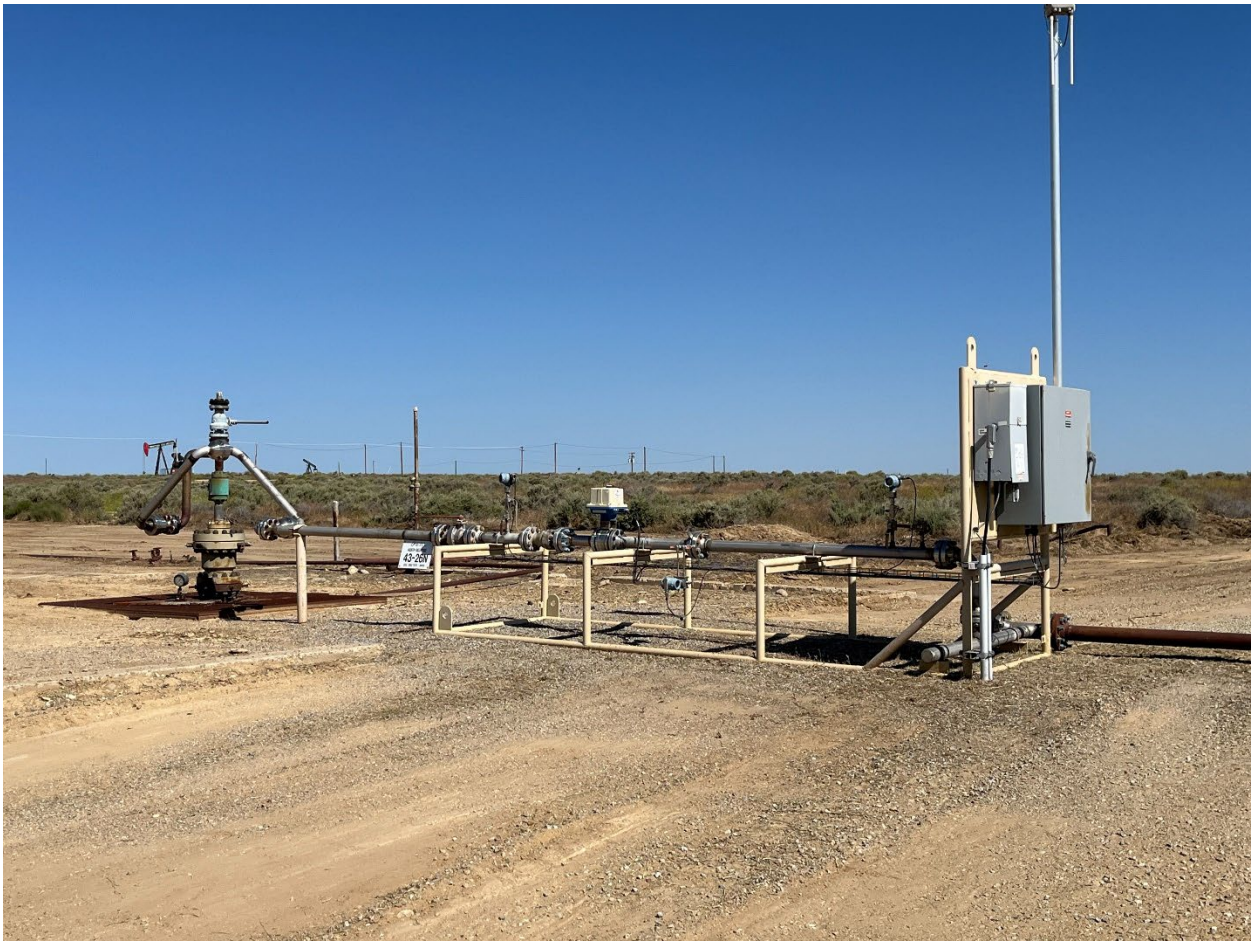
Figure 4.1-14: Existing View of SGS 2972

Figure 4.1-15: Existing View of Proposed CO_2 Capture Area

Typical Project Elements

Figure 4.1-16: Existing View of Pipeline Right-of-Way Corridor – New pipeline would be adjacent to existing pipeline corridor

Figure 4.1-17: Existing Water Injection Well (CLASS VI UIC CO_2 Injection Well would look similar)



Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would have a significant impact on aesthetics and visual resources if it would:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

The project area is confined to an existing oilfield with minimal public visibility due to the lack of public access to the area. Therefore, the proposed project would have little or no effect on potential sensitive viewers because the volume, frequency, and duration of views of the proposed project would be low and viewers primarily would be people driving to and from work or as part of their work. Based on these standards, the effects of the project have been categorized as a "less than significant impact." Mitigation measures are recommended for any potentially significant impacts. If a potentially significant impact cannot be reduced to a less than significant level through the application of mitigation, it is categorized as a "significant unavoidable impact."

Project Impacts

The amount of potential visual change that would be introduced into the existing landscape and the degree to which viewers are likely to be impacted and react to the change are described below for each applicable threshold of significance. Impacts associated with implementation of the project include construction, operation, well stimulation, and decommissioning/abandonment. As previously discussed, Figures 4.1-7 through 4.1-10 illustrate typical photos of the relevant project features that could occur within the project viewshed.

Impact 4.1-1: Have a Substantial Adverse Effect on a Scenic Vista

There are currently no scenic vistas within the project area. Therefore, future CCS activities that would be authorized would not result in significant impacts related to having a substantial adverse effect on a scenic vista during construction, operation, or decommissioning/abandonment.

Mitigation Measures

No mitigation measures are proposed.

Level of Significance

Impacts would be less than significant.

Impact 4.1-2: Substantially Damage Scenic Resources, including, but Not Limited to, Trees, Rock Outcroppings, and Historic Buildings within a State Scenic Highway

There are currently no Designated State Scenic Highways within the project area. Therefore, the project would not substantially damage any scenic resources within a Designated or Eligible State Scenic Highway within the project area, and there would be no substantial aesthetic impacts for construction, operation, well stimulation, or decommissioning/abandonment.

Mitigation Measures

No mitigation measures are proposed.

Level of Significance

Impacts would be less than significant.

Impact 4.1-3: Substantially Degrade the Existing Visual Character or Quality of the Site and Its Surroundings

Impacts on the existing visual character or quality of the site and its surroundings due to construction, operation, or decommissioning of CCS facilities could result from implementation of the project. Aesthetic impacts may result in a substantial change to the landscape character or reduction in scenic quality.

Construction Impacts

Short-term impacts on the existing visual character or quality of a site and its surroundings may occur during construction. Construction-related activities would largely occur in areas with existing oil and gas operations. Equipment would be assembled off site to the extent practical and transported to the proposed location for installation, thus minimizing the duration of a visual impact during construction. Some major equipment could require longer-duration on-site erection or final assembly and interconnection. Heavy equipment and/or heavy cranes are expected for the duration of construction of the capture facilities. The capture facilities would each include three steel towers of varying diameter and height, up to 37 feet in diameter and up to 140 feet tall.

The project would limit impacts to habitat/vegetated areas by using existing disturbed areas for storage and laydown purpose to the maximum extent possible. Laydown areas would be designed to minimize new disturbance by using existing, cleared areas, such as fields, parking lots, or other developed areas. During construction, these areas would have a temporary change in their visual quality; however, following completion of construction, all laydown areas would be returned to pre-project contours and revegetated to native habitat conditions.

Staging areas may be required for material handling, temporary storage, and project staging activities. In addition, concrete batch plants would be temporarily located within the project site during the construction phase.

Short-term impacts could also result from land clearing and grading for pads and work areas, temporary construction access roads, temporary construction areas, and vehicle and equipment operations for facility construction. Short-term aesthetic impacts could result from a reduction in unity, intactness, or vividness created by vegetation removal, grading that noticeably alters existing landforms, and materials, equipment, vehicles, structures, fences, and other elements that would be present during construction.

Vehicle and equipment operations may produce visible dust during land-clearing operations and from traveling on unpaved roadways. Drill rigs, and possibly cranes, are likely to be visible from long distances silhouetted against the sky, especially in the flatter and more open landscapes within the project area. Ground-level activities, such as land clearing and site preparation, require equipment, such as bulldozers, excavators, loaders, and dump trucks. Foundation and facility construction activities would require large delivery vehicles and concrete trucks. The local increase in general vehicular traffic could be a source of visual impact, depending upon the number of trips to and from a specific area. On-site parking could be noticeable during construction if certain sites require a larger number of workers and, consequently, their vehicles. Nighttime lighting for construction or safety and security in construction areas may also result in short-term aesthetic impacts; these impacts associated with creating new sources of substantial light or glare are addressed separately under Impact 4.1-4.

The severity of construction-related aesthetic impacts depends not only on the reduction in unity, intactness, and vividness produced by the construction activities, but also on the visibility and proximity of these activities to viewers and the sensitivity of viewers to changes in the landscape's character and quality. Due to the lack of sensitive receptors within and adjacent to the project CCS Surface Land Use boundary and surrounding area, and the general lack of receptors passing by the project site given its remote location and surrounding private roadways, and the already degraded condition of the project stie as an existing oilfield, project construction would not substantially degrade the visual character of the site or its surroundings, and the impact would be less than significant.

Following completion of the project, all construction equipment would be removed. While not necessary, Mitigation Measures (MM) 4.1-1 through MM 4.1- would further reduce these less than significant impacts.

Operational and Decommissioning Impacts

Upon completion of all construction activities, the project proponent would ensure that the facility would be properly operated and maintained. The project proponent would develop an operations and maintenance protocol to be implemented throughout the life of the project (see Section 3.6). The protocol would specify routine maintenance and operation, which typically adheres to the maintenance program developed by the project proponent. Operation and maintenance personnel would also inspect access roads, crane pads, and trenched areas regularly and maintain them to ensure minimal erosion and maintenance of the visual character of the site.

Long-term impacts on the existing visual character or quality of the site would be minimal, given that the existing area and its surroundings already contain similar looking facilities and infrastructure (see Figure 4.1-11 through Figure 4.1-17). Any increases in the numbers of structures would be marginal in comparison to existing facilities and, as explained above and in Chapter 3, *Project Description*, would closely resemble facilities and infrastructure already onsite (see Figures 4.1-11 through Figure 4.1-17).

Wells would undergo plugging and abandonment once storage capacity targets have been met. In decommissioning, all injection and monitoring wells and associated infrastructure would be disassembled and salvaged or appropriately disposed of. The well pad location would be restored to grade and allowed to revegetate. Typical construction equipment, such as bulldozers, motor graders, front end loaders, cement and dump trucks, and well workover rigs, would be used to accomplish this work and would be removed upon completion of their use.

Various facilities or facility pipelines that are no longer needed for operations would be dismantled and removed. The same would apply for injection facilities associated with CO_2 injection wells.

As an existing oilfield, the project site, like many others around it, is already relatively degraded. The installation of additional, comparable facilities and infrastructure would not further substantially degrade the visual character of the site or its surroundings, given existing conditions and the overall lack of receptors near the project site or passing by the project site (see above). Therefore, the impact of project operations would be less than significant. Moreover, similar to project construction, project decommissioning likewise would not further substantially degrade the visual character of the site or its surroundings. Nevertheless, MM 4.1-1 through MM 4.1-4 would further reduce these already less than impacts.

Mitigation Measures

MM 4.1-1 All derricks, boilers, and other drilling equipment used to drill, repair, clean out, deepen, or redrill any well shall be removed from the drill site within 90 days after completion or after abandonment of any well. Earthen sumps used in drilling shall be filled within 90 days after any well has been placed in production (unless such sumps are to be used within six months for the drilling of another well), and any sump used in productions shall be filled after its abandonment and restored to a uniform grade within ninety days.

MM 4.1-2 Sumps and ponds shall be permitted only to the extent authorized by the Central Valley Regional Water Quality Control Board (via waiver, Waste Discharge Requirements, or other form of authorized written documentation) and shall comply with all applicable legal requirements and mitigation measures for sumps serving as storage, percolation or evaporation ponds for produced water.

MM 4.1-3 Project signage is limited to directional, warning, safety, security, and identification signs in connection with oil, gas, or other hydrocarbon drilling and development operations in accordance with Chapter 19.84.135 of the Kern County Zoning Ordinance.

MM 4.1-4 Prior to issuance of a building, grading or implementation of a U.S. Environmental Protection Agency permit to construct, a Project Boundary Signage Plan for the CCS Surface Land Area shall be submitted. The plan shall include the size and wording on signs that create virtual access to a map that shows the CCS Surface Land Area and notes the existence of a CO_2 storage area underground. The sign shall also include a phone number and email. The plan shall include the spacing of the physical signage around the entire perimeter of the CCS Surface Land Area approved in the permit.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.1-4: Create a New Source of Substantial Light or Glare That Would Adversely Affect Day or Nighttime Views in the Area

Sources of light and glare may be short term or long term. Short-term lighting is most often associated with temporary activities occurring during nighttime hours, such as providing safety, security, or temporary visibility for construction, farming, processing, or similar intermittent or temporary activities. Short-term glare may occur from temporary facilities supporting construction or other activities, such as areas for storage of materials or equipment, construction staging areas, and vehicle parking areas. Long-term sources of light or glare are most often associated with providing safety, security, or visibility for established development and operations. Impacts resulting from introducing new sources of substantial light or glare into the landscape were assessed. Because of the high number of variables, light and glare are not measured quantitatively but, instead, are assessed qualitatively in this visual assessment.

Impacts on aesthetic resources due to construction, operation, or decommissioning could result from activities that create a new source of substantial light or glare that would adversely affect day or nighttime views in the vicinity of the activities. Introducing new sources of substantial light or glare where it may affect viewers with high-visual sensitivity (i.e., people with high interest and concern for the visual quality of the landscape and changes to it, such as residents from the vicinity of their homes or people engaging in recreation or leisure activities) is of particular concern. However, due to the County's interest in protecting views of the night sky, promoting energy conservation and a reduction in the generation of greenhouse gases by reducing excessive or unwanted outdoor lighting, and encouraging a less light-oriented nighttime environment, introducing new sources of substantial light and glare is of concern for all viewers during all phases of development.

Construction Impacts

Aesthetic impacts of introducing new sources of substantial light and glare may result from any of the various activities described for construction impacts under Impact 4.1-4, described above. Most construction activities would primarily occur during daytime hours. Construction activities that are likely to occur at night and require artificial illumination would include drilling activities, vehicle and equipment activities supporting drilling, and safety and security lighting for areas, such as

construction yards, work areas, vehicle and equipment parking areas, and staging and laydown areas. The primary purposes of nighttime lighting would be to protect the safety of the construction workers and the security of equipment, materials, and vehicles. Once drilling operations for the Class VI wells begin, they typically run continuously, 24 hours a day, due to the complexity of drilling and the hazards associated with leaving a well unattended during the drilling process. The length of time required for drilling, and thus the time that drilling operations would require nighttime lighting, would vary depending on the depth of the well being drilled. Drilling may require from less than 24 hours up to 60 days, depending on the depth of the formation.

Construction activities generally occur during daytime hours, and may generate glare from construction equipment, materials, and vehicles. Impacts from glare would be dependent upon the location of the sun and orientation of the construction equipment and vehicles relative to viewers.

Construction activities would include drilling rigs, grading activities, trailers, vehicles, laydown areas, and other work areas that may introduce new sources of glare. Glare, in these circumstances, primarily results from reflectance of sunlight off glass, polished metal surfaces, and smooth or light-colored finishes on construction vehicles, equipment, and materials. Glass and polished metal surfaces produce more glare than other reflective surfaces, but these surfaces would be only minimally present during project construction (for example, vehicle and equipment windows and perhaps some vehicle bumpers). The greatest sources of potential glare during construction would be from light-colored vehicles and equipment, which may be visible in the vicinity of each of the drilling rigs being used during construction. However, glare from light-colored vehicles, if any, would not be substantial. It would be transient—viewable only by a limited number of passersby in vehicles primarily on limited stretches of private roadways that require permission for travel, during very specific times of day from specific angles when and where glare might occur. It also would be temporary and would not present circumstances so different than what already exist, whereas, currently, light-colored vehicles appear on-site regularly. Thus, this impact is less than significant.

Construction activities may also introduce new sources of nighttime lighting. The greatest sources of new nighttime lighting would be associated with drilling rigs and safety and security lighting for various facilities and would occur in the short term. Although exposure of receptors to nighttime construction lighting would be very limited (see above) and temporary, it is possible that throughout the project's construction, impacts associated with nighttime lighting may be considered potentially significant. MM 4.1-5, however, would reduce any potential impacts to a less than significant level. MM 4.1-5 requires compliance with Kern County Zoning Chapter 19.81 – Outdoor Lighting "Dark Sky Ordinance," which is designed to reduce unnecessary night lighting and minimize impacts on surrounding properties and protect Kern County's rural character. To that end, the Ordinance includes several requirements for the reduction of impacts associated with nighttime lighting, such as lighting height restrictions, a prohibition on most upward facing lighting, preparation of an Outdoor Lighting plan, as necessary, and limitations on wattages and lumens near residences. These requirements would reduce any potential impacts associated with project construction lighting, which would nevertheless be temporary, to a less-than-significant level.

Operational and Decommissioning Impacts

Aesthetic impacts of introducing new sources of substantial light and glare may result from any of the various activities and elements described for operation impacts under Impact 4.1-3, discussed above. Operational activities and elements may create new sources of substantial glare that may adversely affect daytime views in the area include elements with polished metal surfaces or smooth or light-colored finishes, such as new above-ground pipe, tanks, and process towers. Glare would primarily result from reflectance of sunlight off highly reflective surfaces and be dependent upon the location of the sun and orientation of the operation elements relative to viewers. Given the limited number of passersby in vehicles on limited stretches of private roadways that require permission for travel and given that any glare off of the limited number of new light-colored facilities and infrastructure would only occur at very specific times of day from very specific angles, the potential for operation-related glare is small, not substantial, and less than significant.

Typically, injection units would not have nighttime lighting during operation except during brief periods of maintenance. Safety and security lighting reflecting off the surfaces of various facilities, tall light standards with exposed bulbs, or light sources that cast light may be visible across a broad area. Where new lighted facilities are sited near other existing similarly lighted facilities of other structures, aesthetic impacts may be less severe than when they are located in areas with few existing light sources.

As explained in Impact 4.1-3, wells would undergo plugging and abandonment once storage capacity targets have been met. In decommissioning the site, construction type levels of light and glare would occur on a temporary basis.

Although exposure to project operation nighttime lighting would be limited (see above) to the extent that impacts from nighttime lighting during project operations and decommissioning could be considered substantial, and therefore might result in potentially significant impacts; MM 4.1-5, discussed above, would reduce these potential impacts to a less than significant level.

Summary of Project Aesthetic and Visual Impacts

Visual impacts resulting from potential new sources of glare that might adversely affect daytime views in the area due to construction, operation, or decommissioning of CCS facilities would be less than significant. Visual impacts resulting from potential new nighttime light that could adversely affect nighttime views in the area might be potentially significant. Any light that is produced from the project site would be visible only to a minimal number of off-site viewers because the private roads leading into Belridge oilfields are closed to the public. The proposed project would likely introduce new lighting features during construction and operations, similar to those currently existing within the project site; however, the project would be required to conform to the Kern County Dark Skies Ordinance, which would require the minimum lighting possible for safety, as well as shielding of light fixtures and a downward orientation to eliminate light spillover. The following mitigation measures would be implemented to reduce the level of significance.

Mitigation Measures

MM 4.1-5 All new lighting, including permanent nighttime lighting, safety, security, and operational lightening, shall comply with the standards in Kern County Zoning Chapter 19.81 – Outdoor Lighting "Dark Sky Ordinance."

Level of Significance after Mitigation

impacts would be less than significant.

4.1.5 Cumulative Setting, Impacts, and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present, and reasonably foreseeable future oil and gas development, including wells and abandonment activity to implement CCS projects, constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development, in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance – 2015(c) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018, an SREIR certified on March 8, 2021, and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells per year countywide of various types (production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection, and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 other wells (cyclic wells, Senate Bill [SB] 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for 8 years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the state of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. California Geologic Energy Management Division permitting for all wells with the exception of plugging and abandonments has never averaged over 2,000 permits a year (as implementation in some years of the Kern County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts to aesthetic and visual resources is considered the Belridge oilfields and surrounding viewshed. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects*, would have on aesthetics and visual resources. This geographic scope of analysis is appropriate because the visual quality within this area is expected to be similar to that of the project site because of its proximity, similar environment and landform, and would result in similar land use.

Impact 4.1-5: Contribute to Cumulative Aesthetic Impacts

Regarding impacts to aesthetic and visual resources, the project has the potential to contribute to cumulative impacts to aesthetic and visual resources within the region. A complete analysis and evidence for the record of the cumulative impacts on visual resources of the various ground-disturbing activities from oil and gas are provided in Section 4.1, *Aesthetics* of the Oil and Gas EIR. No additional feasible mitigation measures exist to avoid or reduce significant adverse cumulative impacts to aesthetics (existing visual character) to a less than significant level. Even with the implementation of MM 4.1-1 through MM 4.1-5, cumulative impacts to visual would be significant and unavoidable with the additions of the injection wells, monitoring wells, and capture facilities equipment.

Mitigation Measures

Implement MM 4.1-1 through MM 4.1-5 as described above.

Level of Significance after Mitigation

Cumulative impacts would be significant and unavoidable.

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Section 4.2

Agriculture and Forestry Resources

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Section 4.2

Agriculture and Forestry Resources

4.2.1 Introduction

This section of the Environmental Impact Report (EIR) describes the affected environment and regulatory setting for agriculture and forestry resources. This section also describes the impacts to agriculture and forestry resources that would result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers [km]) southwest of the community of Lost Hills and west of State Route (SR) 33.

The analysis of the proposed project's potential impacts on agriculture and forest resources was conducted based on a qualitative review and analysis of the Kern County Agricultural Crop Report, California Department of Conservation (DOC), Division of Land Resource Protection's Important Farmland Map, and Kern County's Williamson Act Map. In addition, the analysis of potential impacts is based on an analysis of applicable goals and policies related to agricultural resources in the Kern County General Plan (KCGP).

A description of the environmental setting (affected environment) for to agricultural resources is presented in Section 4.2.2, *Environmental Setting*, including discussion of the regional and local agricultural resources. The regulatory setting applicable to agricultural resources is presented in Section 4.2.3, *Regulatory Setting* and Section 4.2.4, *Impacts and Mitigation Measures*, discusses project impacts and associated mitigation measures.

4.2.2 Environmental Setting

Regional Setting

Kern County is California's third largest county, encompassing 8,202 square miles at the southern end of the Central Valley. Kern County has a history of agricultural operations with approximately 1,373 square miles of harvested agricultural land and 2,317 square miles of range land. The 2022 total Agricultural Product Value produced in Kern County was $7,724,166,300 (Table 4.2-1), which is a decrease of 7.4 percent over the 2021 Agricultural Product Value (Kern County Department of Agriculture 2022). The top five commodities for 2022 were grapes, citrus, milk, almonds, and pistachios, which make up more than $4 billion, 52 percent, of the total Agricultural Product Value (Kern County Department of Agriculture 2022).

Table 4.2.1: Agricultural Product Values for Kern County in 2022

Product	Total Value
Fruit and Nut Crops	$4,464,472,000
Field Crops & Rangeland	$397,032,000
Vegetable Crops	$1,141,127,000
Nursery Crops	$141,298,000
Industrial and Wood Crops	$34,854,000
Seed Crops	$8,428,300
Livestock and Poultry	$340,526,000
Livestock and Poultry Products	$1,092,651,000
Apiary Products	$103,779,000
TOTAL	$7,724,166,300

Source: Kern County Department of Agriculture 2022

Despite the increase in Agricultural Product Value, Kern County's agricultural areas face an increase in pressure to convert productive farmland to housing, industrial, and commercial development. The total net loss of agricultural lands in the unincorporated area of the County during the period of 1998 to 2021 has been 36,476 acres (Kern County Planning and Natural Resources Department 2022). Within the KCGP area, most of the agricultural lands that have been converted since 1998 have been used as solid waste buffer and continue to be farmed through leases to neighboring farmers.

The Kern Council of Governments (COG) projects that Kern County's population will grow from its 2020 Census population of 909,000 to more than 1,186,600 in 2046 (Kern COG 2022). This growth in population could lead to further increase the amount of agricultural land conversion to non-agricultural uses in Kern County.

Local Setting

Land Ownership and Site Conditions

The project site encompasses 12,362 acres, consisting of 45 parcels of land located in the administrative boundaries of the Belridge oilfields. The proposed CO_2 capture facilities would be located within the developed portion of the South Belridge oilfield. The proposed CO_2 storage reservoir, in the North Belridge oilfield, is made up of privately owned parcels totaling approximately 2,290 acres of land, predominately developed with oil and gas production and accessory facilities and infrastructure.

The project site has no developed water source; therefore, the agricultural productivity of the land is limited. No part of the project site is being actively farmed. Current and historic uses of the project site include its use as the Belridge oilfields. Existing land use in the vicinity of the project

site generally includes oil and gas exploration and production, grazing, and agricultural lands. Review of the U.S. Department of Agriculture–Forest Service map indicates there are no forests within or in close proximity to the project site (U.S. Department of Agriculture 2024).

Zoning

Most parcels within the proposed Conditional Use Permit (CUP) boundary have a zone classification of A (Exclusive Agriculture), with the exception of five parcels which have a zone classification of A-1 (Limited Agriculture) and one parcel which currently has a zone classification of A/NR (20) (Natural Resources–20-acre minimum).

Important Farmland

The project site does not contain any land designated Prime Farmland, Unique Farmland, or Farmland of Statewide Importance by the DOC (Figure 4.2-1). However, the proposed project site has two parcels and a portion of one parcel subject to Farmland Security Zone (FSZ) Contracts and a one parcel subject to Williamson Act Land Use Contracts. Twenty-two parcels within the CUP boundary are included within the boundaries of Agriculture Preserve Numbers 2 and 5.

The DOC designates the project site as predominantly as either Grazing Land or Semi-Agricultural and Rural Commercial Land, portions designated Urban and Built-up Land, with a small portion also being designated as Vacant or Disturbed.

Figure 4.2-1: California Important Farmland

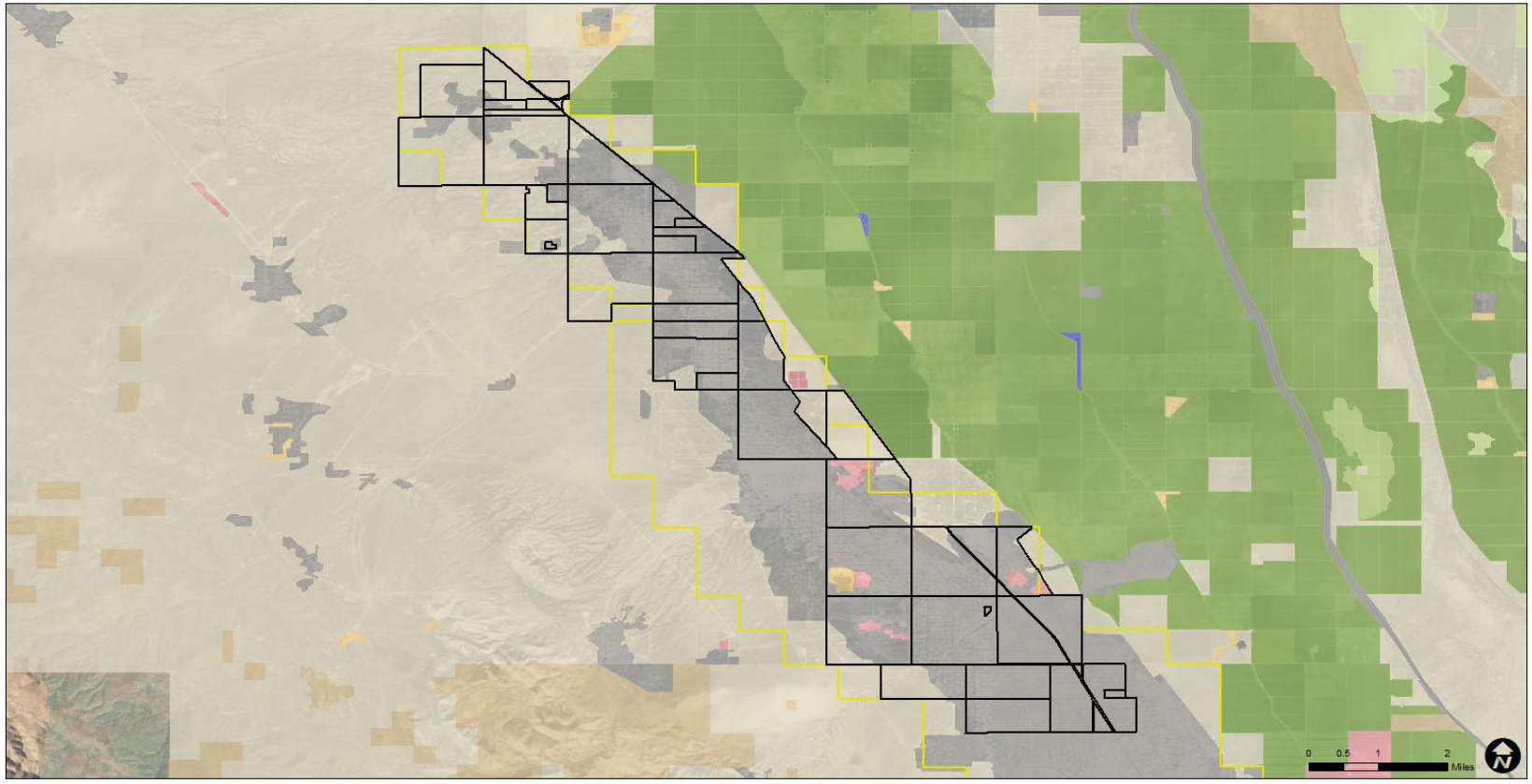
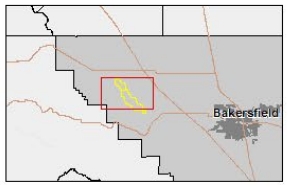


FIGURE 4.2-1
California Important Farmland

Draft Environmental Impact Report
Aera CarbonFrontier Project



CUP Boundary
Belridge Oilfields

California Important Farmland

- Prime Farmland
- Farmland of Statewide Importance
- Urban and Built-Up Land
- Grazing Land
- Rural Residential Land
- Unique Farmland
- Vacant or Disturbed Land
- Nonagricultural and Natural Vegetation
- Semi-Agricultural and Rural Commercial Land

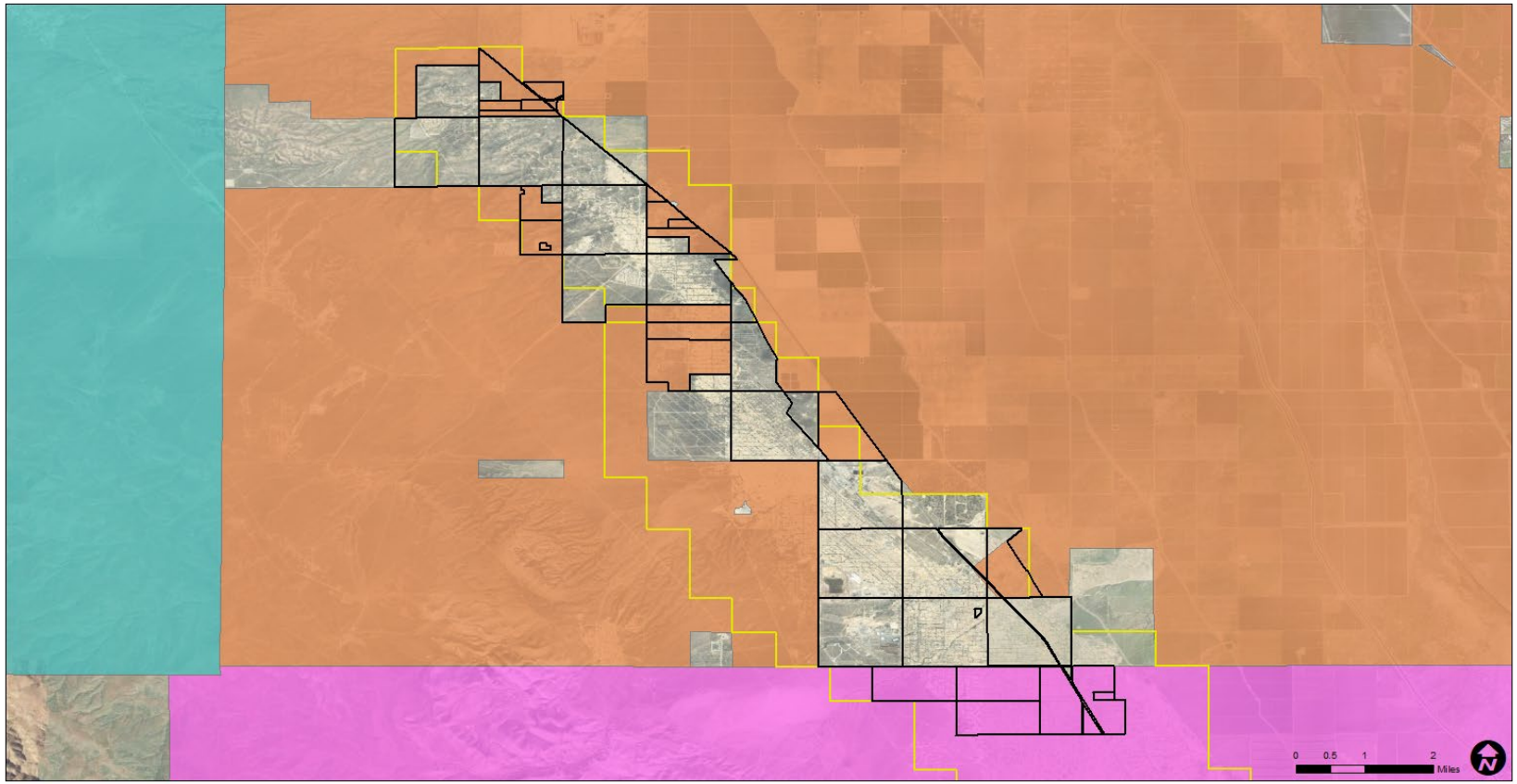
Data Source: WSP 2024, FMMP 2024

Agricultural Preserve

An agricultural preserve defines the boundary of an area within which the County may enter into Williamson Act contracts with landowners. The boundary is designated by resolution of the Board of Supervisors. Agricultural preserves must generally be at least 100 acres in size. All A (Exclusive Agriculture) zoned property in Kern County is required to be in the agricultural preserve which is divided into areas. As stated above, 22 parcels within the CUP boundary are included within the boundaries of an Agriculture Preserve: five of which included within the boundaries of Agriculture Preserve Number 2 and 17, within the boundaries of Agriculture Preserve Number 5 (Figure 4.2-2).

The area constituting Agricultural Preserve Number 2 includes lands that are typically designated as prime agricultural land or land with high agricultural productivity. Agricultural Preserve Number 5 includes lands that are not necessarily prime agricultural land, but still have significant agricultural value, and usually include land with varying soil quality or agricultural potential.

Figure 4.2-2: Agricultural Preserve



Land Use Contracts – Williamson Act Contracts

Williamson Act contracts are voluntary and are contract between the Board of Supervisors and a landowner for the purpose of restricting specific parcels of land to agricultural or related open space use. Land must qualify for the use based on the Kern County Adopted Uniform Rules. Private land, with qualified uses, within locally designated agricultural preserve areas are eligible for enrollment under a contract. The minimum term for contracts is 10 years. However, since the contract term automatically renews on each anniversary date of the contract, the actual term continues indefinitely until either the property owner files a nonrenewable notice with the County or requests an immediately cancellation process. Cancellation is not automatic and requires making findings established by State law and compliance with California Environmental Quality Act (CEQA).

Landowners receive substantially reduced property tax assessments in return for enrollment under a Williamson Act contract. Property tax assessments of Williamson Act contracted land are based upon generated income as opposed to potential market value of the property (California Department of Preservation 2024). As stated above, within the CUP boundary, APN: 068-200-33 is subject to a Williamson Act Contract (Figure 4.2-3).

Land Use Contracts – Farmland Security Zone

FSZ contracts are voluntarily entered into between the Board of Supervisors and a landowner for 20 years as opposed to the 10 years of a standard Williamson Act contract. FSZ contracts offer landowners greater property tax reduction (California Department of Preservation, 2024). As stated above, within CUP boundary, APN: 068-220-26 and APN: 085-210-42 are subject to FSZ contracts. Additionally, a portion of APN: 068-200-33 is subject to an FSZ Contract (Figure 4.2-3).

Figure 4.2-3: Williamson Act and FSZ Contracts

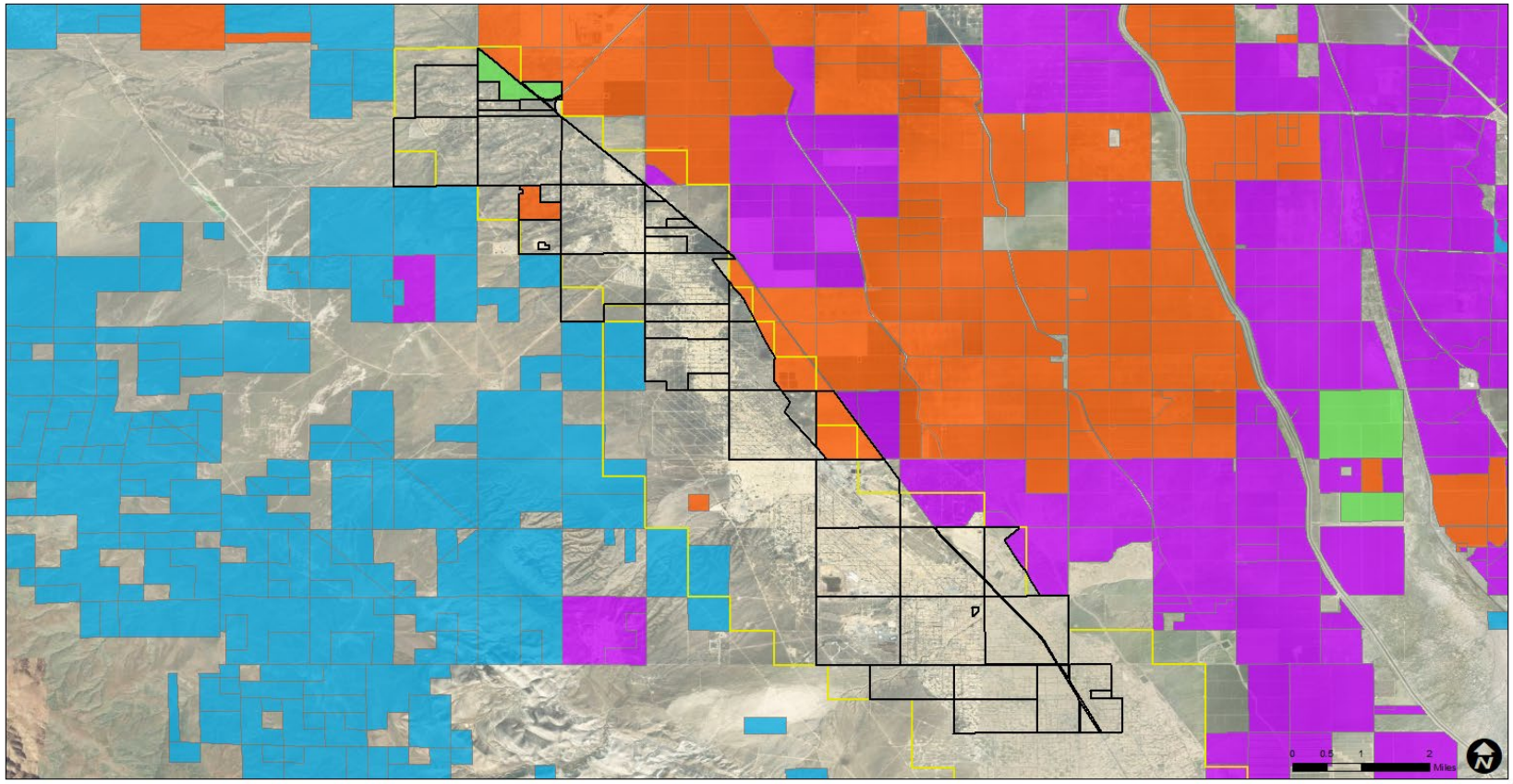
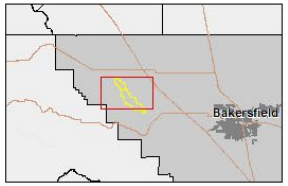


FIGURE 4.2-3
Williamson Act and
FSZ Contracts

Draft Environmental Impact Report
Aera CarbonFrontier Project



CUP Boundary
Belridge Oilfields

Williamson Act (Active)
Farmland Security Zone (FSZ)
Mixed
Nonprime
Prime

Data Source: WSP 2024, FMMP 2024

4.2.3 Regulatory Setting

Federal

Farmland Protection Policy Act (7 U.S.C. Section 4201)

The purpose of the Farmland Protection Policy Act (FPPA) is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. It additionally directs federal programs to be compatible with State and local policies for the protection of farmlands. Congress passed the Agriculture and Food Act of 1981 (Public Law 97-98) containing the FPPA—Subtitle I of Title XV, Section 1539-1549. The final rules and regulations were published in the Federal Register on June 17, 1994.

The FPPA is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to non-agricultural uses. It ensures that, to the extent possible, federal programs are administered to be compatible with State, local units of government, and private programs and policies to protect farmland. Federal agencies are required to develop and review their policies and procedures to implement the FPPA every two years. The FPPA does not authorize the federal government to regulate the use of private or non-federal land or, in any way, affect the property rights of owners.

For the purpose of FPPA, farmland includes Prime Farmland, Unique Farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but not water or urban built-up land.

Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to non-agricultural use and are completed by a federal agency or with assistance from a federal agency (NRCS 2024).

State

California Department of Conservation, Division of Land Resource Protection

The DOC applies the Natural Resources Conservation Service (NRCS) soil classifications to identify agricultural lands, and these agricultural designations are used in planning for the present and future of California's agricultural land resources. The DOC has a minimum mapping unit of 10 acres, with parcels that are smaller than 10 acres being absorbed into the surrounding classifications.

Farmland Mapping and Monitoring Program

The list below provides a comprehensive description of all the categories mapped by the DOC (DOC 2004). Collectively, lands classified as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland are referred to as Farmland (DOC 2004).

- **Prime Farmland (P):** Farmland that has the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- **Farmland of Statewide Importance (S):** Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- **Unique Farmland (U):** Farmland of lesser quality soils used for the production of the State's leading agricultural crops. This land is usually irrigated but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.
- **Farmland of Local Importance (L):** Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.
- **Grazing Land (G):** Land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The minimum mapping unit for Grazing Land is 40 acres.
- **Urban and Built-up Land (D):** Land occupied by structures with a building density of at least one unit per 1.5 acres, or approximately six structures to a 10-acre parcel. This land is used for residential, industrial, commercial, institutional, public administrative purposes, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.
- **Other Land (X):** Land not included in any other mapping category. Common examples include low-density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines and borrow pits; and water bodies smaller than 40 acres. Vacant and non-agricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

  The Rural Land Mapping Project provides more detail on the distribution of various land uses within the other land category in eight Farmland Mapping and Monitoring Program counties, encompassing all the San Joaquin Valley counties. The rural land categories include the following:

  - **Rural Residential Land (R):** Residential areas of one to five structures per 10 acres (ranchettes).
  - **Semi-agricultural and Rural Commercial Land (sAC):** Farmsteads, agricultural storage and packing sheds, unpaved parking areas, composting facilities, equine facilities, firewood lots, and campgrounds.

- **Vacant or Disturbed Land (V):** Open field areas that do not qualify as an agricultural category, mineral and oil extraction areas, offroad vehicle areas, electrical substations, channelized canals, and rural freeway interchanges.
- **Confined Animal Agriculture (Cl):** Poultry facilities, feedlots, diary facilities, fish farms; this use may be a component of farmland of local importance in some counties.
- **Non-agricultural or Natural Vegetation (nv):** Heavily wooded, rocky/barren areas, riparian and wetland areas, grassland areas that do not qualify as grazing land due to their size of land management restrictions, small waterbodies, and recreational water ski lakes. Constructed wetlands are also included in this category.
- **Water (W):** Perennial waterbodies with an extent of at least 40 acres.

California Land Conservation Act (Williamson Act)

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, is promulgated in California Government Code Section 51200-51297.4, and therefore is applicable only to specific land parcels within the State of California. The Williamson Act enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space uses in return for reduced property tax assessments. Private land within locally designated agricultural preserve areas with specific qualified uses are eligible for enrollment under Williamson Act contracts. The Williamson Act program is administered by the DOC, in conjunction with local governments, which administer the individual contracts with landowners. The landowner commits the parcel to a 10-year period wherein no conversion out of agricultural use is permitted. Each year the contract automatically renews unless a notice of non-renewal or cancellation is filed. In return, the land is taxed at a rate based on the actual use of the land for agricultural purposes, as opposed to its unrestricted market value. An application for immediate cancellation can also be requested by the landowner, provided that the proposed immediate cancellation application is consistent with the cancellation criteria stated in the California Land Conservation Act and those adopted by the affected county. Non-renewal or immediate cancellation does not change the zoning of the property.

The Williamson Act states that a board or council by resolution shall adopt rules governing the administration of agricultural preserves. The rules of each agricultural preserve specify the uses allowed. Generally, any commercial agricultural use will be permitted within any agricultural preserve. In addition, local governments may identify compatible uses permitted with a use permit.

California Government Code Section 51238 states that, unless otherwise decided by a local board or council, the erection, construction, alteration, or maintenance of electric and communication facilities, as well as other facilities, are determined to be compatible uses within any agricultural preserve. Also, Section 51238 states that Board of Supervisors may impose conditions on lands or land uses to be placed within preserves to permit and encourage compatible uses in conformity with Section 51238.1.

Further, California Government Code Section 51238.1 allows a board or council to allow as compatible any use that without conditions or mitigations would otherwise be considered incompatible. However, this may occur only if that use meets the following conditions:

- The use will not significantly compromise the long-term productive agricultural capability of the subject contracted parcel or parcels on other contracted lands in agricultural preserves.
- The use will not significantly displace or impair current or reasonably foreseeable agricultural operations on the subject contracted parcel or parcels or on other contracted lands in agricultural preserves. Uses that significantly displace agricultural operations on the subject contracted parcel or parcels may be deemed compatible if they relate directly to the production of commercial agricultural products on the subject contracted parcel or parcels or neighboring lands, including activities such as harvesting, processing, or shipping.
- The use will not result in the significant removal of adjacent contracted land from agricultural or open space use.

A board or council may approve uses on non-prime land, which, because of off-site or on-site impacts, would not comply with the first two criteria, provided that the use is approved pursuant to a CUP that sets forth findings required by California Government Code Section 51238.1(c).

The Kern County has an active Williamson Act Land Use Contract Program. The 2023 subvention report filed with the State of California shows 1,477,607.62 acres under Williamson Act Contract for 10-year contracts that require qualifying uses be maintained (Kern County Planning and Natural Resources Department 2023). The project has one assessor's parcel number (APN): 068-200-33 subject to Williamson Act Land Use Contract.

Farmland Security Zone Act

The Farmland Security Zone Act is similar to the Williamson Act and was passed by the California State Legislature in 1999 to ensure that long-term farmland preservation is part of public policy. Farmland Security Zone Act Contracts are sometimes referred to as "Super Williamson Act Contracts." Under the provisions of this act, a landowner already under a Williamson Act contract can apply for Farmland Security Zone status by entering into a contract with the county. Farmland Security Zone classification automatically renews each year for an additional 20 years. In return for a further 35 percent reduction in the taxable value of land and growing improvements (in addition to Williamson Act tax benefits), the owner of the property promises not to develop the property into non-agricultural uses.

Kern County has an active Farmland Security Zone Act Contract Program. The 2023 subvention report filed with the State of California shows 177,377.9 acres under Farmland

Security Zone Act Contracts for 20-year contracts that require qualifying uses be maintained (Kern County Planning and Natural Resources Department 2023). The project has two parcels (APN: 068-220-26 and 085-210-42) subject to FSZ contracts.

Local

Kern County General Plan

The project site is located within the Kern County General Plan (KCGP), and 107.1 acres are located within the Soledad Mountain-Elephant Butte Specific Plan. The KCGP states that agriculture is vital to the future of Kern County and sets the goals of protecting important agricultural lands for future use and preventing the conversion of prime agricultural lands to other uses (for example, industrial or residential). The KCGP includes three designations for agricultural land:

- **8.1 Intensive Agriculture** - Minimum parcel size is 20 acres gross. Devoted to the production of irrigated crops or having potential for such use;
- **8.2 Resource Reserve** - Minimum parcel size is 20 acres gross, except lands subject to a Williamson Act Contract/Farmland Security Zone Contract, in which case the minimum parcel size shall be 80 acres gross. Devoted to areas of mixed natural resource characteristics including rangeland, woodland, and wildlife habitat which occur in an established County water district; and
- **8.3 Extensive Agriculture** - Minimum parcel size is 20 acres gross, except lands subject to a Williamson Act contract/Farmland Security Zone contract, in which case the minimum parcel size shall be 80 acres gross. Devoted to uses involving large amounts of land with relatively low value-per-acre yields such as livestock grazing, dry-land farming, and woodlands.

The policies, goals, and implementation measures in the KCGP for Agriculture and Forest Resources applicable to the project are provided below. The KCGP contains additional policies, goals, and implementation measures that are more general in nature and not specific to development such as the project. Therefore, they are not listed below, but as stated in Chapter 2, *Introduction*, all policies, goals, and implementation measures in the KCGP are incorporated by reference.

Chapter 1. Land Use, Open Space, and Conservation Element

1.9 – Resource

Goals

- **Goal 1.** To contain new development within an area large enough to meet generous projections of foreseeable need, but in locations which will not impair the economic strength derived from the petroleum, agriculture, rangeland, or mineral resources, or diminish the other amenities which exist in the County.
- **Goal 2.** Protect areas of important mineral, petroleum, and agricultural resource potential for future use.

- **Goal 3.** Ensure the development of resource areas minimize effects on neighboring resource lands.
- **Goal 5.** Conserve prime agriculture lands from premature conversion.

Policies

- **Policy 1.** Appropriate resource uses of all types will be encouraged as desirable and consistent interim uses in undeveloped portions of the County regardless of General Plan designation.
- **Policy 2.** In areas with a resource designation on the General Plan map, only industrial activities which directly and obviously relate to the exploration, production, and transportation of the particular resource will be considered to be consistent with the General Plan.
- **Policy 5.** Areas of low intensity agriculture use (Map Code 8.2 (Resource Reserve), Map Code 8.3 (Extensive Agriculture), Map Code 8.5 (Resource Management)) should be of an economically viable size in order to participate in the State Williamson Act Program/Farmland Security Zone Contract.
- **Policy 7.** Areas designated for agricultural use, which include Class I and II and other enhanced agricultural soils with surface delivery water systems, should be protected from incompatible residential, commercial, and industrial subdivision and development activities.
- **Policy 11.** Minimize the alteration of natural drainage areas. Require development plans to include necessary mitigation to stabilize runoff and silt deposition through utilization of grading and flood protection ordinances.
- **Policy 12.** Areas identified by the NRCS (formerly Soil Conservation Service) as having high range-site value should be conserved for Extensive Agriculture uses or as Resource Reserve, if located within a County water district.
- **Policy 15.** Agriculture and other resource uses will be considered a consistent use in areas designated for Mineral and Petroleum Resource uses on the General Plan.
- **Policy 21.** The County shall encourage qualifying agricultural lands to participate in the Williamson Act program or Farmland Security Zone program.

Implementation Measures

- **Implementation Measure F.** Prime agricultural lands, according to the Kern County Interim-Important Farmland 2000 map produced by the Department of Conservation, which have Class I or II soils and a surface delivery water system shall be conserved through the use of agricultural zoning with minimum parcel size provisions.
- **Implementation Measure G.** Property placed under the Williamson Act/Farmland Security Zone Contract must be in a Resource designation.

Kern County Ordinance

The Kern County Zoning Ordinance establishes basic regulations under which land is developed. This includes allowable uses, building setback requirements, and development standards. Pursuant to state law, the zoning ordinance must be consistent with the KCGP. The basic intent of the Kern County Zoning Ordinance is to promote and protect the public health, safety, and welfare via the orderly regulation of the land uses throughout the unincorporated area of the County. The zoning ordinance applies to all property in unincorporated Kern County, except land owned by the United States or any of its agencies. As previously mentioned in Chapter 3, *Project Description*, and as described in Section 4.2.2, *Environmental Setting*, the Kern County Zoning Ordinance designates the project site for agricultural or estate residential uses.

Williamson Act Standard Uniform Rules

Kern County has adopted a set of Agricultural Preserve Standard Uniform Rules that identify land uses that are considered compatible uses within agricultural preserves established under the Williamson Act. These rules are designed to restrict the uses of land enrolled in a Williamson Act contract to agriculture or other compatible uses. Agricultural uses include crop cultivation, grazing operations, commercial wind farms, livestock breeding, dairies, and uses that are incidental to agricultural uses. Other compatible uses include the erection of gas, electric, communications, water, and other similar public utilities.

4.2.4 Impacts and Mitigation Measures

Methodology

The analysis of the proposed project's potential impacts on agriculture and forest resources was conducted based on a qualitative review and analysis of the Kern County Agricultural Crop Report, California DOC Division of Land Resource Protection's Important Farmland Map, and Kern County's Williamson Act Map. In addition, the analysis of potential impacts is based on an analysis of the KCGP's applicable goals and policies related to agricultural resources.

Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would have a significant impact on agricultural and forestry resources if it would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) to non-agricultural use;
- Conflict with existing zoning for agricultural use or a Williamson Act contract;
- Conflict with existing zoning for, or cause rezoning of, forest land or timberland;
- Result in the loss of forest land or conversion of forest land to non-forest use;

- Involve other changes in the existing environment which, because of their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use; and
- Result in the cancellation to an open space contract made pursuant to the California Land Conservation Act of 1965 or Farmland Security Zone Contract for any parcel of 100 or more acres.

Project Impacts

Impact 4.2-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to Non-agricultural Use

As depicted in Figure 4.2-1, based on the most current data available from the DOC, Division of Land Resource Protection Farmland Mapping and Monitoring Program, there is no Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) within the project site. Therefore, implementation of the project would not convert such Farmland to non-agricultural uses.

Although the project would require approval of a zone change case from A-1 (Limited Agriculture) to A (Exclusive Agriculture) to permit the processing of the CUP for the carbon capture and storage (CCS) project, this rezoning would allow for more types of agricultural uses "by-right" within the project area thereby increasing opportunities for viable agricultural crop and grazing land. The A-1 (Limited Agriculture) zoning is intended for a combination of rural residential (2.5 acres minimum lot size) and commercial agriculture. CCS activities are not compatible with the A-1 residential use; therefore, a rezoning of the land is required for project implementation. If the project area is leased for agricultural or farming purposes during project implementation, the proposed project activities could result in potentially significant impacts with compatibility for the CCS Surface Land Area over the carbon dioxide (CO_2) storage areas and near the injection well sites. Therefore, Mitigation Measure (MM) 4.2-1 would be required to reduce these potential impacts to a less than significant level.

Mitigation Measures

MM 4.2.-1 Prior to any use of any portion of the CCS Surface Land Area for agricultural cultivation, the CCS owner/operator shall provide the following for review and approval to the Kern County Planning and Natural Resources Department:

a. A site plan showing the location of the agricultural operations within the CCS Surface Land Area that includes a written signed statement from the CCS owner/operator of the following requirements:

1. No activities are being authorized for the agricultural lease that would involve drilling of any water wells or other exploratory activities that would penetrate the confined cap layer to cause a leak.

2. No use of the buffer area around the injection well sites is included in any agricultural cultivation or related operations.
3. Acknowledgment that the farming operation has been informed and has a binding agreement to not conduct any activities near or in proximity to either the injection well sites or the capture facilities that would damage the fencing or equipment and a Worker Awareness Program for the farming employees of the use of the underground for CO_2 storage.
4. That any lease for agricultural cultivation is bound by all applicable requirements of the project CUP and EIR Mitigation Monitoring and Reporting Plan.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.2-2: Conflict with Existing Agricultural Zoning or Williamson Act Contracts

The project proponent is seeking approval of a zone change from A-1 (Limited Agriculture) to A (Exclusive Agriculture). Therefore, the project site could continue to be used for compatible agricultural uses. Furthermore, at the end of the project lifespan, project infrastructure could be removed, and the land disturbed by the project could be restored to conditions suitable for agricultural uses. Implementation of the project would not be in conflict with existing agricultural zoning classifications.

As depicted in Figure 4.2-3, one parcel APN: 068-200-33 is subject to Williamson Act Land Use Contract. Kern County has adopted a set of Agricultural Preserve Standard Uniform Rules that identify land uses that are considered compatible uses within agricultural preserves established under the Williamson Act. The rules include 19 classes of compatible uses that include, but are not limited to, oil and gas drilling and production in accordance with Chapter 19.98 of the Ordinance Code of Kern County, as well as the erection of gas, electric, communications, water, and other similar public utilities. Although the CUP boundary includes a parcel that is subject to Williamson Act, there would be no surface project features (for example, injection facility, capture facility, or staging area) within this parcel. As such, the project would not conflict with ongoing land uses and activities within these parcels. Therefore, no impact would occur.

Mitigation Measures

No mitigation measures are required.

Level of Significance

No impact would occur.

Impact 4.2-3: Conflict with Existing Zoning for, or Cause Rezoning of, Forest Land or Timberland

While timber production is allowed "by-right" on lands zoned A (Exclusive Agriculture), the project would not cause the rezoning of lands zoned for forest land or timberland, nor would it conflict with timber production. Although, timber production is allowed on lands zoned A (Exclusive Agriculture), the properties within the project area do not support timberland, forest land, or production of timber. In addition, the project proponent would obtain CUPs under Kern County Zoning Ordinance, Section 19.08.085, and Section 19.06.020 to allow for the construction and operation of carbon capture sites, Class VI UIC injection wells, and accessory infrastructure. Therefore, the project would be consistent with Kern County Zoning Ordinance regulations for storage operation. The project would not conflict with existing zoning for, or cause rezoning of, forest land or timberland, nor would it conflict with timber production. Therefore, no impact would occur.

Mitigation Measures

No mitigation measures are required.

Level of Significance

No impact would occur.

Impact 4.2-4: Result in the Loss of Farmlands and/or Forest Land or Conversion of Forest Land to Non- Forest Use

As previously mentioned, the project site is not within an area used for or support farmland or forest land. Existing land use in the vicinity of the project site generally includes oil and gas exploration and production, grazing, and agricultural lands. The DOC designates the project site as predominantly as either Grazing Land or Non-agricultural and Natural Vegetation with a small portion also being designated as Vacant or Disturbed. Due to a lack of forest land on the site, the project would not result a loss of forest land or conversion of forest land to non-forest use. Therefore, no impact would occur.

Mitigation Measures

No mitigation measures are required.

Level of Significance

No impact would occur.

Impact 4.2-5: Result in the Cancellation of an Open Space Contract Made Pursuant to the California Land Conservation Act of 1965 or Farmland Security Zone Contract for Any Parcel of 100 or More Acres

As depicted in Figure 4.2-3, the project site has three parcels (APN: 068-200-33, 068-220-26, and 085-210-42) subject FSZ contracts. However, there would be no surface project features (for

example, injection facility, capture facility, or staging area) within these parcels. No cancellation of an Open Space Contract or Farmland Security Zone is anticipated as the project would not conflict with ongoing land uses and activities within these parcels. Therefore, no impact would occur.

Mitigation Measures

No mitigation measures are required.

Level of Significance

No impact would occur.

Cumulative Setting Impacts and Mitigation Measures

4.2.5 Cumulative Setting Impacts and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present, and reasonably foreseeable future oil and gas development, including wells and abandonment activity to implement CCS projects, constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells per year countywide of various types (production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection, and gas disposal) (pages 3-37 and 3-38 Supplemental Recirculated Environmental Impact Report [SREIR] 2020/2021) and an additional 5,066 other wells (cyclic wells, Senate Bill [SB] 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for 8 years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. California Geologic Energy Management Division

permitting for all wells with the exception of plugging and abandonments has never averaged over 2,000 permits a year (as implementation in some years of the Kern County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts to agriculture resources is considered the entire County. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects*, would have on agriculture resources. This geographic scope of analysis is appropriate because the agriculture, farming, and forestry resources within this area are expected to be similar to those in the project site because of their proximity; similar environments, landforms, and hydrology would result in similar land use and, thus, site types.

Impact 4.2-6: Contribute to Cumulative Agriculture and Forest Resources Impacts

Regarding impacts to significant agriculture and forest resources, the project has the potential to contribute significantly to cumulative impacts within the region. A complete analysis and evidence for the records of the cumulative impacts of the various ground disturbing activities from oil and gas are provided in Chapter 4.2, *Agricultural and Forestry Resources*, of the Oil and Gas EIR.

Population growth is expected to continue in the County, and conversion of agricultural land to non-agricultural use can be expected from the need for additional residential development and infrastructure to accommodate the growth in the County.

The 2022 Kern COG Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS) forecasts the addition of 304,300 people and the conversion of 13 square miles between 2018 and 2046 (Kern COG 2022). Implementation of the Kern COG RTP/SCS (Kern COG 2022) would continue to reduce the rate of Farmland conversion due to policies to concentrate new development in existing urban areas and mitigate for potential impacts. Nonetheless, due to the importance of the region's agricultural resources, the potential impacts related to the project's incremental contribution to the cumulative farmland conversion would be considered cumulatively considerable.

Because there are other factors, such as commodity pricing in the global market and water pricing and availability that influence the feasibility of ongoing agricultural operations in Kern County, there may be a cumulative significant loss in agricultural resources in Kern County for reasons that are outside the jurisdiction and control of the County. The 2004 KCGP also forecasts a net loss of 80,854 acres of prime and important farmland and 55,000 acres of grazing lands in Kern County based on land use conversions consistent on existing land use plans, which would further reduce Kern County's agricultural lands. The 2022 KCGP/Housing Element Annual Report shows that 30,794 acres of farmland have been lost since the 2004 projection. As the use of the land for a CCS storage facility restricts approximately 9,130 acres of land for agricultural industries, if remediated from oil and gas use and may discourage the use of the land for crops or orchards, the loss of agricultural land is significant and unavoidable. As there is no other CCS project in operation in California for evidence of the use of the surface for agricultural industries, such as crop processing or cold storage, or even the growing and harvesting of crops, all feasible and

reasonable mitigation measures have been imposed. Based on the countywide loss of agricultural land due to the Groundwater Sustainability Act, reduction in water for agricultural use, drought conditions, and urban growth patterns, the loss is considered significant and unavoidable.

Prime Farmland, Unique Farmland, or Farmland of Statewide Importance

With regard to projects converting Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural uses, the project would not result in the conversion of these classes of farmland to other uses and would therefore not make a cumulatively considerable contribution to a cumulative impact in connection with impacts from past, present, or reasonably foreseeable projects.

Forest Land or Timberland

With regard to conflicts with or losses of forest land or timberland, the project would not conflict with the A (Exclusive Agriculture) zoning which allows for timber production. The project would not affect any forest land or timberland or conflict with the A (Exclusive Agriculture) zoning, which allows for timber production. Consequently, the proposed project would not make a cumulatively considerable contribution to a cumulative impact to forest land or timberland in connection with impacts from past, present, or reasonably foreseeable projects.

Williamson Act Contracts

With regard to conflicts with existing agricultural zoning, Williamson Act contracts and Farmland Security Zone Contracts, within CUP boundary there are three parcels subject to these contracts. However, no surface project features are located within these parcels, therefore there will be no conflict between project activities and ongoing land uses within these parcels.

Mitigation Measures

The project would be required to implement MM 4.2-1 as described above.

Level of Significance

Impacts would be significant and unavoidable.

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Section 4.3

Air Quality

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Section 4.3
Air Quality

4.3.1 Introduction

This section of the Environmental Impact Report (EIR) describes the affected environment and regulatory setting for air quality. It also describes the impacts on air quality that would result the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers [km]) southwest of the community of Lost Hills and west of State Route (SR) 33.

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present and reasonably foreseeable future oil and gas development including wells and abandonment activity to implement carbon capture and storage projects constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance. *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated Environmental Impact Report (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under the California Environmental Quality Act (CEQA) (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

A description of the environmental setting (affected environment) for air quality is presented below in Section 4.3.2, *Environmental Setting*. The regulatory setting applicable to Air Quality related impacts is presented in Section 4.3.3, *Regulatory Setting*, and Section 4.3.4, *Impacts and Mitigation Measures,* discusses project impacts and associated mitigation measures.

4.3.2 Environmental Setting

The project is in the larger San Joaquin Valley Air Basin (SJVAB), which encompasses 3,700 square miles and generally includes most of the San Joaquin Valley (SJV) floor or western portion of the county. The SJV floor is within the southern end of the SJVAB, which is made up of all or portions of eight counties in California's Central Valley. These counties include Fresno, Kings,

Madera, Merced, San Joaquin, Stanislaus, and Tulare counties, as well as the SJV portion of Kern County. The western portion of Kern County, where the project is located is regulated by the San Joaquin Valley Air Pollution Control District (SJVAPCD).

Air pollution in the SJVAB can be attributed to both human-related (anthropogenic) and natural (non-anthropogenic) activities that produce emissions. Air pollution from significant anthropogenic activities in the SJVAB includes a variety of industrial-based sources as well as on- and off-road mobile sources. Activities that tend to increase mobile activity include increases in population, increases in traffic (including automobiles, trucks, aircraft, and rail), urban sprawl (which increases commuter driving distances), and general local land management practices as they pertain to modes of commuter transportation (SJVAPCD 2015). Air pollution is also transported into the SJVAB from a variety of sources, including Northern California and Asia (Faloona et al. 2015).

Meteorological Conditions

The SJVAB is the southern half of California's Central Valley and is 250 miles long and bordered by mountains on three sides. The SJV is bordered by the Sierra Nevada to the east (8,000 to 14,491 feet in elevation), the Coast Ranges to the west (averaging 3,000 feet in elevation), and the Tehachapi Mountains to the south (6,000 to 7,981 feet in elevation). There is a slight downward elevation gradient from Bakersfield in the southeast end (elevation 408 feet) to sea level at the northwest end where the valley opens to the San Francisco Bay at the Carquinez Straits. At its northern end is the Sacramento Valley, which comprises the northern half of California's Central Valley. The bowl-shaped topography inhibits movement of pollutants out of the valley.

The overall climate in the SJVAB is warm and semi-arid. The SJV is in a Mediterranean Climate Zone. Mediterranean Climate Zones occur on the West Coast of continents at 30 to 40 degrees latitude and are influenced by a subtropical high-pressure area most of the year. Mediterranean climates are characterized by sparse rainfall, which occurs mainly in the winter. There is only one wet season during the year and 90 percent of the precipitation falls during October through April. Snow in the SJV is infrequent and thunderstorms seldom occur. Summers are hot and dry. Summertime maximum temperatures often exceed 100 degrees Fahrenheit (°F) in the SJV.

The subtropical high-pressure area is strongest during spring, summer, and fall and produces subsiding air, which can result in temperature inversions in the valley. Air temperature in the lowest layer of the atmosphere typically decreases with altitude. A reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion. The height of the base of the inversion is known as the "mixing height." This is the level to which pollutants can mix vertically. Mixing of air is minimized above the inversion base. The inversion base represents an abrupt density change where little air movement occurs. A temperature inversion can act like a lid, inhibiting vertical mixing of the air mass near the land surface, resulting in trapping of air pollutants below the inversion. Most of the surrounding mountains are above the normal height of summer inversions (1,500 to 3,000 feet). Concentration levels of air pollutants are directly related to inversion layers due to the limitation of vertical mixing. Inversion layers enhance the formation of ozone (O_3) and limit dispersion of directly emitted pollutants like particulate matter (PM) and carbon monoxide (CO) (SJVAPCD 2015).

Winter-time high-pressure events can often last many weeks with surface temperature often lowering into the 30°F range. During these events, fog can be present, and inversions are extremely strong. These winter-time inversions can inhibit vertical mixing of pollutants to a few hundred feet (SJVAPCD 2015).

The transport and dispersion of air pollutants in ambient air are influenced by many complex factors. The primary factors are wind, topological boundaries, and atmospheric stability. During the summer, wind speed and direction data indicate that summer wind usually originates at the north end of the SJV and flows in a south-southeasterly direction through the valley and the Tehachapi Pass, into the Mojave Desert. During the winter months, the SJV experiences light, variable winds, less than 10 miles per hour.

Topography

Air pollution is directly related to a region's topographic features. The SJVAB is approximately 250 miles long, an average of 35 miles wide, and is the second largest air basin in the state. The SJVAB is defined by the Sierra Nevada in the east (8,000 to 14,000 feet in elevation), the Coast Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi Mountains in the south (6,000 to 8,000 feet in elevation). The valley is basically flat with a slight downward gradient to the northwest and opens to the sea at the Carquinez Strait where the San Joaquin-Sacramento Delta empties into San Francisco Bay.

Wind Patterns

The SJVAB's topography has a dominating effect on wind patterns. Winds tend to blow somewhat parallel to the valley and mountain range orientation. In spring and early summer, thermal low-pressure systems develop over the interior basins east of the Sierra Nevada, and the Pacific High (high-pressure system that develops over the central Pacific Ocean near the Hawaiian Islands) moves northward. These developments and the topography produce the high incidence of relatively strong northwesterly winds in the spring and early summer (SJVAPCD 2015).

Wind speed and direction data indicate that during the summer, winds usually originate at the north end of the SJVAB and flow in a south-southeasterly direction through the Tehachapi Pass into the Southeast Desert Air Basin. Wind speed and direction data indicate that during the winter, winds occasionally originate from the south end of the SJVAB and flow in a north-northwesterly direction. Also, during winter, the SJVAB experiences light, variable winds, typically less than 10 mph. Low wind speeds, combined with low inversion layers in the winter, create a climate conducive to high CO and inhalable particulates concentrations (SJVAPCD 2015).

For the southernmost portion of the SJVAB, steady winds are typical in the mountainous area that characterizes this portion, and quickly disperse air pollutants.

Temperature

The vertical rise and mixing of air pollutants is limited by the presence of persistent temperature inversions. Inversions may be either ground level or elevated. Ground-level inversions occur frequently during early fall and winter (October through January). High concentrations of primary pollutants, which are those emitted directly into the atmosphere (for example, CO), may be found at these times. Elevated inversions function as a lid over the basin and limit vertical mixing, resulting in severe air stagnation. Elevated inversions contribute to the occurrence of high levels of O_3 during the summer months.

In winter, storm systems moving in from the Pacific Ocean bring a maritime influence to the SJV. The Sierra Nevada prevents the cold, continental air masses from influencing the valley. Temperatures below freezing are unusual. Historical data from the Buttonwillow monitoring station indicate average lows in the 30s during winter and average lows in the 60s in the summer. Average highs in the winter in the 50s, and average highs in the summer are in the 90s (WRCC 2023a).

Precipitation

Precipitation in the SJVAB is strongly influenced by the position of the semi-permanent subtropical high-pressure area located off the Pacific coast (the Pacific High). In the winter, this high-pressure system moves southward, allowing Pacific storms to move through the SJVAB. The majority of the precipitation in the valley is winter rain produced by these storms. Snowstorms, hailstorms, and ice storms occur infrequently in the valley, and severe occurrences are very rare.

Precipitation in the SJVAB is typically less than 8 inches per year. The SJV is an area of variable relative humidity. During the warm season, humidities are characteristically low and occasionally, under the influence of the "norther,", readings may drop to below 10 percent. In the delta area, at the confluence of the Sacramento and San Joaquin Rivers, a strong inflow of marine air during the summer creates a transition zone between the high humidities of the coast and the low readings of the interior. Winter values are usually moderate to high. A shallow layer of ground fog, known locally as "tule fog," frequently forms at night and can persist for as long as two or three weeks (WRCC 2023b).

Existing Air Quality

The U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have established health-based ambient air quality standards for several different pollutants. The EPA sets National Ambient Air Quality Standards (NAAQS) for the following seven pollutants for ozone, CO, nitrogen dioxide (NO_2), respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), sulfur dioxide (SO_2) and lead (Pb). These seven pollutants are commonly referred to as "criteria pollutants." Primary standards provide public health protection, including protecting the health of "sensitive" populations, such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

In addition, CARB has established California Ambient Air Quality Standards (CAAQS) standards for these pollutants, as well as for sulfate (SO_4^{2-}), visibility reducing particles, hydrogen sulfide (H_2S), and vinyl chloride. California standards are generally stricter than national standards. The NAAQS and the CAAQS are shown in Table 4.3-1.

Table 4.3-1: National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[b, e]	National Standards[a, e]	
			Primary[c]	Secondary[d]
Ozone (O_3)	1-Hour	0.09 ppm (180 µg/m^3)	---[f]	---
	8-Hour	0.070 ppm (137 µg/m^3)	0.070 ppm (147 µg/m^3)	Same as Primary Standard
Carbon monoxide (CO)	1-Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	---
	8-Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	---
Nitrogen dioxide (NO_2)	1-Hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)	---
	Annual Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary Standard
Sulfur dioxide (SO_2)[g]	1-Hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	---
	3-Hour	---	---	0.5 ppm (1,300 µg/m^3)
	24-Hour	0.04 ppm (105 µg/m^3)	---	---
Respirable Particulate Matter (PM_{10})[h]	24-Hour	50 µg/m^3	150 µg/m^3	Same as Primary Standard
	Annual Mean	20 µg/m^3	---	---
Fine Particulate Matter ($PM_{2.5}$)[h]	24-Hour	---	35 µg/m^3	Same as Primary Standard
	Annual Mean	12 µg/m^3	12.0 µg/m^3	15 µg/m^3
Lead (Pb)	30-day Average	1.5 µg/m^3		
	Rolling 3-month Average		0.15 µg/m^3	Same as Primary Standard

Table 4.3-1: National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[b, e]	National Standards[a, e]	
			Primary[c]	Secondary[d]
Hydrogen sulfide (H_2S)	1-Hour	0.03 ppm (42 µg/m^3)	No Federal Standards	
Sulfate (SO_4^{2-})	24-Hour	25 µg/m^3		
Visibility reducing particles	8-Hour	See Note i		
Vinyl chloride[j]	24-Hour	0.01 ppm (26 µg/m^3)		

Sources: CARB 2016; EPA 2023a;

Notes:

[a] NAAQS (other than ozone, PM, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth-highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. For particulate matter less than 10 microns (PM_{10}), the 24-hour standard is not to be exceeded more than once per year on average over three years. The 24-hour standard is attained when the three-year average of the weighted annual mean at each monitor within an area does not exceed 150 µg/m^3. For particulate matter less than 2.5 microns ($PM_{2.5}$), the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, do not exceed 35 µg/m^3. The annual standard is attained when the three-year average of the weighted annual mean at single or multiple community-oriented monitors does not exceed 12 µg/m^3.

[b] CAAQS for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (SO_2; 1- and 24-hour), nitrogen dioxide (NO_2), PM_{10} and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded.

[c] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[d] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse impacts of a pollutant

[e] Concentration expressed first in units in which it was promulgated. Parts per million (ppm) in this table refers to ppm by volume or micromoles of pollutant per mole of gas.

[f] The federal 1-hour ozone standard was revoked for most areas of the United States, including all of California on June 15, 2005.

[g] Final rule signed June 2, 2010. The 1971 annual and 24-hour SO_2 standards were revoked in that same rulemaking.

[h] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m^3 to 12 µg/m^3. Existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m^{3}also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over three years.

[i] In 1989, the CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

[j] The CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health impacts determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Key:

ppb = parts per billion

ppm = parts per million

µg/m^3 = micrograms per cubic meter

mg/m^3 = milligrams per cubic meter

Table 4.3-2 summarizes the federal and State attainment status for the SJVAB, as of 2023, based on the NAAQS and CAAQS, respectively.

Table 4.3-2: Attainment Status for the SJVAPCD

Pollutant	Designation/Classification	
	Federal	State
Ozone	Nonattainment/Extreme[a,b]	Nonattainment/Severe
PM_{10}	Attainment[c]	Nonattainment
$PM_{2.5}$	Nonattainment[d]	Nonattainment
Carbon monoxide (CO)	Unclassifiable/Attainment	Attainment/Unclassified
Nitrogen dioxide (NO_2)	Unclassifiable/Attainment	Attainment
Sulfur dioxide (SO_2)	Attainment/Unclassified	Attainment
Lead (Pb)	Unclassifiable/Attainment	Attainment
Hydrogen sulfide (H_2S)	No Federal Standard	Unclassified
Sulfates (SO_4^{2-})	No Federal Standard	Attainment
Visibility reducing particulate	No Federal Standard	Unclassified

Source: SJVAPCD 2023a

Notes:

[a] Even though the EPA revoked the federal 1-hour ozone standard, including associated designations and classifications in 2005, the EPA had previously classified the SJVAB as extreme nonattainment for this standard. The EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan on March 8, 2010. Many applicable requirements for extreme 1-hour ozone nonattainment areas continue to apply to the SJVAB.

[b] Though the SJV was initially classified as serious nonattainment for the 1997 8-hour ozone standard, the EPA approved reclassification to extreme nonattainment in the Federal Register on May 5, 2010.

[c] On September 25, 2008, the EPA redesignated the SJV to attainment for the PM_{10} standard and approved the PM_{10} Maintenance Plan.

[d] The SJV is designated nonattainment for the 1997, 2006 and 2012 $PM_{2.5}$ standard.

Key:

PM_{10} = particulate matter less than 10 microns

$PM_{2.5}$ = particulate matter less than 2.5 microns

SJVAPCD = San Joaquin Valley Air Pollution Control District

On May 2014, the SJVAPCD formally requested that the EPA determine that the SJV has attained the federal 1-hour ozone standard based on the fact that the SJV has been meeting the 1-hour ozone standard based on the "expected exceedance days" test over the 2011 to 2013 three-year period air monitoring data.

Since 1992, the SJVAPCD air quality management strategies have focused on the 1-hour ozone standard, trying to achieve the emissions reductions needed to demonstrate attainment by developing and implementing attainment plans, adopting over 500 stringent rules related to emissions reductions, and supplementing its regulatory programs with a voluntary incentive program.

Ambient Air Quality

The SJVAPCD, CARB, National Park Service, and Santa Rosa Rancheria in Lemoore operate an extensive network of air monitoring stations in the SJV. The monitoring station network provides air quality monitoring data, including real-time meteorological data and ambient pollutant levels, as well as historical data. The network in the SJVAB consists of 37 monitoring stations, eleven of which are located in western Kern County within the project area (SJVAPCD 2022). Table 4.3-3 presents the measured ambient pollutant concentrations and the exceedances of State and federal standards that have occurred at the above-mentioned monitoring stations from 2019 through 2021.

Criteria Air Pollutants and Health Effects

The following is a general description of the criteria air pollutants that are hazardous to human health and are regulated by federal and State ambient air quality standards or criteria for outdoor concentrations.

Ozone (O_3)

In the presence of ultraviolet radiation, nitrogen oxides (NO_X) and volatile organic compounds (VOCs)/reactive organic gases (ROG) go through a number of complex chemical reactions to form ozone. Table 4.3-3 includes the maximum hourly concentration and the number of days above the federal and State standards. As shown in Table 4.3-3, ozone continues to be above the State 1-hour and both the federal and State 8-hour ozone standards in many places in Kern County. The SJVAPCD attainment status for ozone is currently severe nonattainment for State 1-hour ozone; nonattainment/extreme for the federal 8-hour ozone; and nonattainment for State 8-hour ozone.

While ozone in the upper atmosphere protects the earth from harmful ultraviolet radiation, high concentrations of ground-level ozone can adversely affect the human respiratory system. Many respiratory ailments, as well as cardiovascular disease, are aggravated by exposure to high ozone levels. Ozone also damages natural ecosystems, such as forests and foothill communities; agricultural crops; and some manufactured materials, such as rubber, paint, and plastic. High levels of ozone may negatively affect immune systems, making people more susceptible to respiratory illnesses, including bronchitis and pneumonia. Ozone also accelerates aging and exacerbates preexisting asthma and bronchitis and, in cases with high concentrations, can lead to the development of asthma in active children. Active people, both children and adults, appear to be more at risk from ozone exposure than those with a low level of activity. Additionally, the elderly and those with respiratory disease are also considered sensitive populations for ozone.

People who work or play outdoors are at a greater risk for harmful health effects from ozone. Children and adolescents are also at greater risk because they are more likely than adults to spend time engaged in vigorous activities. Research indicates that children under 12 years of age spend nearly twice as much time outdoors daily than adults. Teenagers spend at least twice as much time as adults in active sports and outdoor activities. Also, children inhale more air per pound of body weight than adults, and they breathe more rapidly than adults. Children are less likely than adults to notice their own symptoms and avoid harmful exposures.

Table 4.3-3:: Ambient Air Quality in Kern County – California and National Standards

CARB Air Monitoring Station	Number of Days Exceeding CAAQS[(a)]			Maximum Monitored Concentration State			Number of Days Exceeding NAAQS[(a)]			Maximum Monitored Concentration National		
	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
1-Hour Ozone (O_3) (ppm)												
Bakersfield 5558 California Avenue	2	3	0	0.097	0.110	0.090	*	*	*	*	*	*
Oildale 3311 Manor Street	1	3	6	0.099	0.109	0.107	*	*	*	*	*	*
Maricopa Stanislaus Street	0	7	0	0.086	0.122	0.083	*	*	*	*	*	*
8-Hour Ozone (O_3) (ppm)												
Bakersfield 5558 California Avenue	28	25	11	0.088	0.098	0.081	24	25	11	0.088	0.098	0.081
Oildale 3311 Manor Street	20	24	46	0.087	0.096	0.095	16	23	43	0.084	0.096	0.095
Maricopa Stanislaus Street	45	40	11	0.080	0.096	0.077	41	38	10	0.080	0.095	0.077
CO (carbon monoxide) No data.												
NO_2 1-hour (ppm)												
Bakersfield 5558 California Avenue	0	0	0	0.067	0.050	0.057	0	0	0	0.0671	0.0504	0.0572
Shafter Walker St.	0	0	0	0.049	0.040	0.047	0	0	0	0.0493	0.0409	0.0478
SO_X (sulfur oxides) No data.												
PM_{10} 24-hour ($\mu g/m^3$)												
Bakersfield 5558 California Avenue	17	18	124	125.9	196.8	439.3	0	1	3	116.3	193.8	437.5

Table 4.3-3:: Ambient Air Quality in Kern County – California and National Standards

CARB Air Monitoring Station	Number of Days Exceeding CAAQS[(a)]			Maximum Monitored Concentration State			Number of Days Exceeding NAAQS[(a)]			Maximum Monitored Concentration National		
	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Oildale 3311 Manor Street	118	123	129	392.1	277.3	423.0	8	15	2	389.3	517.2	421.4
$PM_{2.5}$ 24-hour ($\mu g/m^3$)												
Bakersfield 5558 California Avenue	*	*	*	*	*	*	12	44	40	59.1	150.7	72.3
Bakersfield-Golden State Highway	*	*	*	*	*	*	4	10	43	66.1	150.2	78.5
Bakersfield 410 E Planz Road	*	*	*	*	*	*	3	17	17	83.7	158.6	70.5

Source: Air Quality Impact Analysis.
Notes:
[(a)] Days exceeding CAAQS and NAAQS are measured number of days for O_3 and NO_2 and measured and estimated number of days, respectively, for PM_{10} and $PM_{2.5}$.
* No standard.
Key:
CAAQS = California Ambient Air Quality Standards
CARB = California Air Resources Board
NAAQS = National Ambient Air Quality Standards
NO_2 = nitrogen dioxide
PM_{10} = particulate matter less than 10 microns
$PM_{2.5}$ = particulate matter less than 2.5 microns
ppb = parts per billion
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter

Ozone is an oxidant that is comparable to household bleach, which can kill living cells (such as germs or human skin cells) on contact. Ozone can damage the respiratory tract, causing inflammation and irritation, and it can induce symptoms such as coughing, chest tightness, shortness of breath, and worsening of asthmatic symptoms. Ozone in sufficient doses increases the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. Exposure to levels of ozone above the current ambient air quality standard can lead to lung inflammation and lung tissue damage and a reduction in the amount of air inhaled into the lungs. Evidence has linked the onset of asthma to exposure to elevated ozone levels in exercising children. Elevated ozone concentrations also reduce crop and timber yields, damage native plants, and damage materials such as rubber, paints, fabric, and plastics (American Lung Association 2015).

Carbon Monoxide (CO)

CO is a colorless, odorless gas produced by incomplete combustion of carbon-containing fuels (for example, gasoline, diesel fuel, and biomass). CO is primarily a byproduct of motor vehicle exhaust, which contributes more than two-thirds of all CO emissions nationwide. In cities, automobile exhaust can cause as much as 95 percent of all CO emissions. These emissions can result in high concentrations of CO, particularly in local areas with heavy traffic congestion. Other sources of CO emissions include industrial processes and fuel combustion in sources such as boilers and incinerators. Despite an overall downward trend in concentrations and emissions of CO, some metropolitan areas still experience high levels of CO.

CO is essentially inert to plants and materials but can have significant effects on human health. CO enters the bloodstream and binds more readily to hemoglobin than oxygen, reducing the oxygen-carrying capacity of blood, thus reducing oxygen delivery to organs and tissues. The health threat from CO is most serious for those who suffer from cardiovascular disease. Healthy individuals are also affected, but only at higher levels of exposure. CO in the bloodstream reduces the blood's capacity for carrying oxygen to the heart, brain, and other parts of the body. Exposure to CO can cause chest pain in heart patients, headaches, and reduced mental alertness. At high concentrations, CO can cause heart difficulties in people with chronic diseases and can impair mental abilities. Exposure to elevated CO levels is associated with visual impairment, reduced work capacity, reduced manual dexterity, poor learning ability, difficulty performing complex tasks, and in prolonged, enclosed exposure, death.

The adverse health effects associated with exposure to ambient and indoor concentrations of CO are related to concentration of carboxyhemoglobin in the blood. Health effects observed may include early onset of cardiovascular disease, behavioral impairment, decreased exercise performance of young healthy men, reduced birth weight, Sudden Infant Death Syndrome, and increased daily mortality rate. Most of the studies evaluating adverse health effects of CO on the central nervous system examine high-level poisoning. Such poisoning results in symptoms ranging from common flu and cold symptoms (shortness of breath on mild exertion, mild headaches, and nausea) to unconsciousness and death. It has been reported that there is an association between daily death rate and exposure to ambient CO in Los Angeles County, where it is postulated that a concentration of 20.2 parts per million (ppm) (the highest daily concentration recorded during a four-year period) contributed to 11 out of 159 deaths. Additional studies conducted in Los Angeles

and in Sao Paulo, Brazil, also suggest a relationship between daily death rates and CO concentrations.

No CO data are available for Kern County for 2019 through 2021. The SJVAPCD attainment status for CO is unclassified/attainment for federal standards and unclassified for State standards.

Nitrogen Dioxide (NO_2) and Oxides of Nitrogen (NO_X)

NO_2 is a reddish brown, highly reactive gas that is formed in the ambient air through the oxidation of nitric oxide. NO_X, the generic term for a group of highly reactive gases that contain nitrogen and oxygen in varying amounts, plays a major role in the formation of ozone, PM, and acid rain. NO_X emissions result from high-temperature combustion processes such as vehicle exhaust emissions and power plants. Home heaters and gas stoves can also produce substantial amounts of NO_2 in indoor settings. The majority of the NO_X emitted from combustion sources is in the form of nitrogen oxide (NO), while the balance is mainly NO_2. NO is oxidized by ozone in the atmosphere to NO_2 but some level of photochemical activity is needed for this conversion.

NO_X reacts with other pollutants to form, ground-level ozone, nitrate particles, acid aerosols, as well as NO_2, which cause respiratory problems. NO_X and the pollutants formed from NO_X can be transported over long distances, following the patterns of prevailing winds. Therefore, controlling NO_X is often most effective if done from a regional perspective, rather than focusing on the nearest sources.

Current scientific evidence links short-term NO_2 exposures, ranging from 30 minutes to 24 hours, with adverse respiratory effects including airway inflammation in healthy people and increased respiratory symptoms in people with asthma. Also, studies show a connection between breathing elevated short-term NO_2 concentrations, and increased visits to emergency departments and hospital admissions for respiratory issues, especially asthma (EPA 2023b. NO_X are ozone precursors that combine with ROGs to form ozone. See the "Ozone (O_3)" section above for a discussion of the health effects of ozone.

Direct inhalation of NO_X can also cause a wide range of health effects. NO_X can irritate the lungs, cause lung damage, and lower resistance to respiratory infections such as influenza. Short-term exposures (for example, less than 3 hours) to low levels of NO_2 (a subset of NO_X) may lead to changes in airway responsiveness and lung function in individuals with preexisting respiratory illnesses. These exposures may also increase respiratory illnesses in children. Long-term exposures to NO_2 may lead to increased susceptibility to respiratory infection and may cause irreversible alterations in lung structure. Other health effects associated with NO_X are an increase in the incidence of chronic bronchitis and lung irritation. Chronic exposure to NO_2 may lead to eye and mucus membrane aggravation, along with pulmonary dysfunction. NO_X can cause fading of textile dyes and additives, deterioration of cotton and nylon, and corrosion of metals due to production of particulate nitrates. Airborne NO_X can also impair visibility. NO_X is a major component of acid deposition in California. NO_X may affect both terrestrial and aquatic ecosystems. NO_X in the air is a potentially significant contributor to a number of environmental effects such as acid rain and eutrophication in coastal waters. Eutrophication occurs when a body of water suffers an increase in

nutrients that reduce the amount of oxygen in the water, producing an environment that is destructive to fish and other animal life.

NO_2 is toxic to various animals as well as to humans. Its toxicity relates to its ability to combine with water to form nitric acid in the eye, lung, mucus membranes, and skin. Studies of the health impacts of NO_2 include experimental studies on animals, controlled laboratory studies on humans, and observational studies. In animals, long-term exposure to NO_2 increases susceptibility to respiratory infections, lowering their resistance to diseases such as pneumonia and influenza. Laboratory studies show susceptible humans, such as asthmatics, exposed to high concentrations of NO_2 can suffer lung irritation and, potentially, lung damage. Epidemiological studies have also shown associations between NO_2 concentrations and daily mortality from respiratory and cardiovascular causes, and with hospital admissions for respiratory conditions.

NO_X contribute to a wide range of environmental effects directly and when combined with other precursors in acid rain and ozone. Increased nitrogen inputs to terrestrial and wetland systems can lead to changes in plant species composition and diversity. Similarly, direct nitrogen inputs to aquatic ecosystems, such as those found in estuarine and coastal waters, can lead to eutrophication (a condition that promotes excessive algae growth, which can lead to a severe depletion of dissolved oxygen and increased levels of toxins harmful to aquatic life). Nitrogen, alone or in acid rain, also can acidify soils and surface waters. Acidification of soils causes the loss of essential plant nutrients and increased levels of soluble aluminum that are toxic to plants. Acidification of surface waters creates conditions of low pH and levels of aluminum that are toxic to fish and other aquatic organisms. NO_X also contribute to visibility impairment.

Table 4.3-3 summarizes NO_X data collected from Kern County monitoring stations. As indicated in the table, there have been no exceedances of the State standards and no data are available to determine exceedances under federal standards. The SJVAPCD attainment status for NO_2 is attainment/unclassified for federal and attainment for State standards.

Particulate Matter (PM_{10} and $PM_{2.5}$)

PM pollution consists of very small aerosol and solid particles suspended in the air. PM is a mixture of materials that can include acids (such as nitrates and sulfates), organic chemicals, smoke, soot, dust, salt, acids, metals, and allergens (such as fragments of pollen or mold spores). PM also forms when gases emitted from motor vehicles and industrial sources undergo chemical reactions in the atmosphere. The EPA currently regulates two types of PM emissions: PM_{10} and $PM_{2.5}$. PM_{10} refers to particles less than or equal to 10 microns in diameter and $PM_{2.5}$ refers to particles less than or equal to 2.5 microns in diameter.

Respirable Particulate Matter (PM_{10})

PM_{10} can be emitted directly, or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NO_X, sulfur oxides (SO_X), VOC, and ammonia, given the right meteorological conditions, can form PM in the form of nitrates (NO_3), SO_4^{2-}, and organic particles. These pollutants are known as

secondary particulates because they are not directly emitted but formed through complex chemical reactions in the atmosphere. Fugitive dust is mostly PM_{10}.

Table 4.3-3 summarizes the ambient PM_{10} data collected from the Bakersfield 5558 California Avenue and Oildale 3311 Manor Street monitoring stations near the project site and includes the maximum 24-hour and annual arithmetic average concentrations and the number of days above the federal and State standards. The SJVAPCD attainment status for the federal PM_{10} standards is attainment and the State PM_{10} standard is nonattainment/severe.

Fine Particulate Matter ($PM_{2.5}$)

Table 4.3-3 summarizes the ambient fine PM data collected from monitoring stations located near the project site. The SJVAPCD is in nonattainment for the federal and State $PM_{2.5}$ standards.

The size of particles is directly linked to their potential for causing health problems. PM_{10} particles pose problems because they can get deep into lungs and the bloodstream. Being even smaller, $PM_{2.5}$ will travel farther into the lungs and can have more severe health impacts. Exposure to $PM_{2.5}$ particles can affect both lungs and heart. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including the following (EPA 2023c):

- Premature death in people with heart or lung disease
- Nonfatal heart attacks
- Irregular heartbeat
- Aggravated asthma
- Decreased lung function
- Increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing

As a consequence of long-term exposure, $PM_{2.5}$ is a stronger risk factor for negative health effects than the coarse part of PM_{10} particles (particles in the 2.5 to 10 micron range). $PM_{2.5}$ constitutes a large portion of combustion particulates, including diesel particulate matter (DPM). The health risk from an inhaled dose of PM depends on the size, composition, and concentration of the particles. Larger particles are generally filtered in the nose and throat, while particulate matter smaller than PM_{10} can settle in the bronchi and lungs and cause health problems. $PM_{2.5}$ can penetrate into the gas-exchange regions of the lungs, and ultrafine particles ($PM_{0.1}$) may pass through the lungs to affect other organs, such as the brain. Combustion PM emissions, including diesel exhaust, often consists of particles smaller than 0.1 microns.

Long-term exposure to fine particulates may contribute to pulmonary and systemic oxidative stress, inflammation, progression of atherosclerosis, and risk of ischemic heart disease and death. Short-term exposure may contribute to complications of atherosclerosis, thrombosis, and acute ischemic events and may lead to increased mortality and morbidity from cardiovascular and respiratory diseases.

PM_{10} and $PM_{2.5}$ have fundamentally distinct physical and chemical properties and health effects, and thus are separately regulated and measured.

The section below entitled "Oil and Gas Operations and Health Effects" further discusses potential health effects of $PM_{2.5}$ emissions, among other things.

PM emissions may also lead to visibility impairment or aesthetic impacts. Visibility degradation is caused by the absorption and scattering of light by particles and gases in the atmosphere before it reaches the observer. As the number of fine particles increases, more light is absorbed and scattered, resulting in less clarity, color, and visual range. Particles that reduce visibility the most have diameters in the range of 0.1 to 1.0 microns. Some types of particles such as sulfates scatter more light, particularly during humid conditions. $PM_{2.5}$ can be transported to other locations and contribute to visibility problems. $PM_{2.5}$ can also affect vegetation by damaging foliage, disrupting the chemical processes within plants, reducing light adsorption, and disrupting photosynthesis (SJVAPCD 2018, 3-5).

Sulfur Dioxide (SO_2)

SO_2 is typically emitted as a result of the combustion of a fuel containing sulfur. SO_2 is a colorless, irritating gas with a "rotten egg" smell formed primarily by the combustion of sulfur-containing fossil fuels. Fuels, such as natural gas, contain very little sulfur and consequently have very low SO_2 emissions when combusted. By contrast, fuels high in sulfur content, such as coal or heavy fuel oils, can emit very large amounts of SO_2 when combusted. Sources of SO_2 emissions come from every economic sector and include a wide variety of fuels, and other gases, liquids, and solids.

Current scientific evidence links short-term exposures to SO_2, ranging from 5 minutes to 24 hours, with an array of adverse respiratory effects including bronchoconstriction and increased asthma symptoms. These effects are particularly important for asthmatics at elevated ventilation rates (for example, while exercising or playing) (EPA 2023d). SO_X can also react with other compounds in the atmosphere to form small particles. These particles penetrate deeply into sensitive parts of the lungs and can cause or worsen respiratory disease, such as emphysema and bronchitis, and can aggravate existing heart disease, leading to increased hospital admissions and premature death. High concentrations of SO_2 can result in temporary breathing impairment for asthmatic children and adults who are active outdoors. Short-term exposures of asthmatic individuals to elevated SO_2 levels during moderate activity may result in breathing difficulties that can be accompanied by symptoms such as wheezing, chest tightness, or shortness of breath. Other effects that have been associated with longer-term exposures to high concentrations of SO_2, in conjunction with high levels of PM, include aggravation of existing cardiovascular disease, respiratory illness, and alterations in the lungs' defenses. SO_2 also is a major precursor to $PM_{2.5}$, which is a significant health concern, and is a primary contributor to poor visibility (see also health effects under "Particulate Matter [PM_{10} and $PM_{2.5}$]," above.)

Exposure to high concentrations of SO_2 for short periods can constrict the bronchi and increase mucous flow, making breathing difficult. Additional health effects of SO_2 are listed below.

- SO_2 can immediately irritate the lung and throat at concentrations greater than 6 ppm in many people.
- SO_2 can impair the respiratory system's defenses against foreign particles and bacteria, when exposed to concentrations less than 6 ppm for longer periods.
- SO_2 can enhance the harmful effects of ozone. (Combinations of the two gases at concentrations occasionally found in the ambient air appear to increase airway resistance to breathing.)
- SO_2 tends to have more toxic effects when acidic pollutants, liquid or solid aerosols, and particulates are also present. (In the 1950s and 1960s, thousands of excess deaths occurred in areas where SO_2 concentrations exceeded 1 ppm for a few days and other pollutants were also high.) Effects are more pronounced among mouth breathers (for example, people who are exercising or who have head colds). These effects include:
  - SO2 concentrations can result in health problems, such as episodes of bronchitis requiring hospitalization associated with lower-level acid concentrations.
  - SO2 concentrations have been linked to self-reported respiratory conditions, such as chronic cough and difficult breathing, associated with acid aerosol concentrations (asthmatic individuals are especially susceptible to these effects. The elderly and those with chronic respiratory conditions may also be affected at lower concentrations than the general population).
  - Increased respiratory tract infections have been associated with longer-term, lower-level exposures to SO2 and acid aerosols.
  - SO2 concentrations are also known to result in subjective symptoms, such as headaches and nausea, in the absence of pathological abnormalities, due to long-term exposure.
- SO_2 easily injures many plant species and varieties, both native and cultivated. Some of the most sensitive plants include various commercially valuable pines, legumes, red and black oaks, white ash, alfalfa, and blackberry. The effects include:
  - Visible injury to the most sensitive plants at exposures as low as 0.12 ppm for 8 hours.
  - Visible injury to many other plant types of intermediate sensitivity at exposures of 0.30 ppm for 8 hours.
- Positive benefits from low levels, in a very few species growing on sulfur deficient soils.
- Increases in SO_2 concentrations accelerate the corrosion of metals, probably through the formation of acids. (SO_2 is a major precursor to acidic deposition.) SO_2 may also damage stone and masonry, paint, various fibers, paper, leather, and electrical components.

- Increased SO_2 also contributes to impaired visibility. Particulate sulfate, much of which is derived from SO_2 emissions, is a major component of the complex total suspended particulate mixture.

As shown in Table 4.3-2, the SJVAPCD is designated attainment or unclassified for all SO_2 State and federal ambient air quality standards, respectively. Due to the restrictions for the use of high sulfur fuels, reduction in gasoline and diesel sulfur contents and reduction in SO_2 emissions from other industrial sources, such as refineries, SO_2 pollution is no longer a major air quality concern in most of California, including the project site.

Lead (Pb)

Lead in the atmosphere occurs as PM. Main sources of lead emissions include leaded gasoline, battery manufacture, paint, ink, ceramics, ammunition, and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. After the phase-out of leaded gasoline between 1978 and 1987, secondary lead smelters, battery recycling, and manufacturing facilities became lead emission sources of greater concern. Current federal standards for lead have no attainment designation, but areas lacking an attainment designation are treated as being in attainment of the standard. The SJVAPCD is designated as attainment for State standards and lead is no longer monitored in the ambient air of the SJVAPCD.

Exposure to lead occurs mainly through inhalation of air and ingestion of lead in food, water, soil, or dust. It accumulates in the blood, bones, and soft tissues and can adversely affect the kidneys, liver, nervous system, and other organs. Excessive exposure to lead may cause neurological impairments such as seizures, intellectual disabilities, and behavioral disorders. Even at low doses, lead exposure is associated with damage to the nervous systems of fetuses and young children, resulting in learning deficits, and lowered intelligent quotients. Studies also show that lead may be a factor in high blood pressure and subsequent heart disease. Lead can also be deposited on the leaves of plants, presenting a hazard to grazing animals and humans through ingestion.

Reactive Organic Gases and Volatile Organic Compounds

Hydrocarbons are organic gases that are formed solely of hydrogen and carbon. There are several subsets of organic gases, including ROGs and VOCs. ROGs are a set of organic gases based on State rules and regulations. VOCs are similar to ROGs in that they include all organic gases except those exempted by federal law. The list of compounds excluded from the definition of VOC is provided by the SJVAPCD in SJVAPCD Rule 1020, Section 3.53. VOCs are emitted from incomplete combustion of hydrocarbons or other carbon-based fuels. Combustion engine exhaust, oil refineries, and oil-fueled power plants are the primary sources of hydrocarbons. Another source of hydrocarbons is evaporation from petroleum fuels, solvents, dry-cleaning solutions, and paint.

The primary health effects of hydrocarbons result from the formation of ozone and its related health effects (see ozone health effects discussion above). High levels of hydrocarbons in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. There are no separate federal or CAAQS for VOC. Carcinogenic forms of VOC are considered

toxic air contaminants (TACs). An example is benzene, which is a carcinogen. The health effects of individual carcinogenic VOCs are described below under the heading "Toxic Air Contaminants."

Sulfates (SO_4^{2-})

Sulfates (SO_4^{2-}) are particulate products of combustion of sulfur-containing fossil fuels. When SO or SO_2 are exposed to oxygen they precipitate out into sulfates (SO_3 or SO_4^{2-}). Sulfates are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (that is, gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to SO_2 during the combustion process and is subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place relatively rapidly and completely in urban areas of California due to regional meteorological features.

CARB's sulfates standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilatory function, aggravation of asthmatic symptoms, and an increased risk of cardiopulmonary disease. Sulfates are particularly effective in degrading visibility, and, because they are usually acidic, can harm ecosystems and damage materials and property.

Hydrogen Sulfide (H_2S)

H_2S is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas and can be emitted as the result of geothermal energy exploitation. In Kern County, H_2S is associated with geothermal activity, oil and gas production, refining, sewage treatment plants, and confined animal feeding operations.

Exposure to low concentrations of H_2S may irritate the eyes, nose, and throat. It may also cause difficulty in breathing for some asthmatics. Exposure to higher concentrations (above 100 ppm) of H_2S can cause olfactory fatigue, respiratory paralysis, and death. Brief exposures to high concentrations of H_2S, greater than 500 ppm, can cause a loss of consciousness. In most cases, the person appears to regain consciousness without any other effects. However, in many individuals, there may be permanent or long-term effects such as headaches, poor attention span, poor memory, and poor motor function. No health effects have been found in humans exposed to typical environmental concentrations of H_2S, 0.00011 to 0.00033 ppm. Deaths due to inhaling large amounts of H_2S have been reported in a variety of different work settings, including sewers, animal processing plants, waste dumps, sludge plants, oil and gas well drilling sites, and tanks and cesspools. Current federal standards for H_2S have no attainment designation and the SJVAPCD is designated as unclassified for State standards.

Visibility Reducing Particulates

Visibility reducing particles are a mixture of suspended PM consisting of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size,

and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt.

This standard is a measure of visibility. CARB does not yet have a measurement method that is accurate or precise enough to designate areas in the state as being in attainment or nonattainment. Thus, the entire state is unclassified.

Vinyl Chloride

Vinyl chloride monomer is a sweet smelling, colorless gas at ambient temperature. Landfills, publicly owned treatment works, and polyvinyl chloride (PVC) production are the major identified sources of vinyl chloride emissions in California. PVC can be fabricated into several products, such as pipes, pipefittings, and plastics. In humans, epidemiological studies of occupationally exposed workers have linked vinyl chloride exposure to development of liver angiosarcoma, which is a rare cancer, and have suggested a relationship between exposure and cancers of the lung and brain. There are currently no adopted ambient air standards for vinyl chloride.

Acute exposure of humans to high levels of vinyl chloride via inhalation has resulted in effects on the central nervous system, such as dizziness, drowsiness, headaches, and giddiness.

Vinyl chloride is reported to be slightly irritating to the eyes and respiratory tract in humans. Acute exposure to extremely high levels of vinyl chloride has caused loss of consciousness, irritation to the lungs and kidneys, and inhibition of blood clotting in humans and cardiac arrhythmias in animals.

Tests involving acute exposure of mice to vinyl chloride have shown a high acute toxicity from inhalation exposure to the substance. Long-term exposure to vinyl chloride concentrations has been linked with chronic health effects:

- Liver damage may result in humans from chronic exposure to vinyl chloride, through both inhalation and oral exposure.
- A small percentage of individuals occupationally exposed to high levels of vinyl chloride in air have developed a set of symptoms termed “vinyl chloride disease,” which is characterized by Raynaud’s phenomenon (fingers blanch and numbness and discomfort are experienced upon exposure to the cold), changes in the bones at the end of the fingers, joint and muscle pain, and scleroderma-like skin changes (thickening of the skin, decreased elasticity, and slight edema).
- Central nervous system effects (including dizziness, drowsiness, fatigue, headache, visual and/or hearing disturbances, memory loss, and sleep disturbances) as well as peripheral nervous system symptoms (peripheral neuropathy, tingling, numbness, weakness, and pain in fingers) have also been reported in workers exposed to vinyl chloride.

Several reproductive/developmental health effects from vinyl chloride exposure have been identified:

- Several case reports suggest that male sexual performance may be affected by vinyl chloride. However, these studies are limited by lack of quantitative exposure information and possible co-occurring exposure to other chemicals.
- Several epidemiological studies have reported an association between vinyl chloride exposure in pregnant women and an increased incidence of birth defects, while other studies have not reported similar findings.
- Epidemiological studies have suggested an association between men occupationally exposed to vinyl chloride and miscarriages in their wives' pregnancies, although other studies have not supported these findings.

Long-term exposure to vinyl chloride has also been identified as a cancer risk:

- Inhaled vinyl chloride has been shown to increase the risk of a rare form of liver cancer (angiosarcoma of the liver) in humans.
- Animal studies have shown that vinyl chloride, via inhalation, increases the incidence of angiosarcoma of the liver and cancer of the liver.

Toxic Air Contaminants

Hazardous air pollutants (HAPs) is a term used by the federal Clean Air Act (CAA) that includes a variety of pollutants generated or emitted by industrial production activities. Called TACs under California law (see Health and Safety Code §§ 39650 et seq.), 10 pollutants have been identified through ambient air quality data as posing the most substantial health risk in California. Direct exposure to all of these pollutants has been shown to cause cancer, birth defects, damage to brain and nervous system and respiratory disorders. CARB provides emission inventories for TACs for only the larger air basins in the state.

Emissions from the top 10 TACs in the SJVAB are presented in Table 4.3-4. Similar to the criteria pollutants, TACs are emitted from stationary sources, areawide sources, mobile sources, and natural sources.

Table 4.3-4: 2023 Toxic Air Contaminant Emissions in the SJVAB (tons per year)

Toxic Air Contaminant	Emissions (tons/year)
Acetaldehyde	3,512
Diesel particulate matter	2,520
Formaldehyde	2,318
Benzene	1,020
Perchloroethylene	448
1,3-Butadiene	269
Methylene chloride	247
PAHs	238
Manganese	217
Acrolein	153

Source: SJVAPCD 2024.
Key:
SJV = San Joaquin Valley
SJVAB = San Joaquin Valley Air Basin

TACs do not have ambient air quality standards. Since no safe levels of TACs can be determined, there are no air quality standards for TACs. Instead, TAC impacts are evaluated by calculating the health risks associated with a given exposure. The requirements of the Air Toxic "Hot Spots" Information and Assessment Act apply to facilities that use, produce, or emit toxic chemicals. Facilities that are subject to the toxic emission inventory requirements of the Act must prepare and submit toxic emission inventory plans and reports, and periodically update those reports. Of the county portion of the SJVAB, no facility in the SJVAPCD has reported cancer risk exceeding 10 in 1 million or a hazard index over 1.0 and, therefore, are not considered significant by the standards of the Hot Spots program in the SJVAPCD.

Health Effects and Risks of Toxic Air Contaminants

Acetaldehyde

Acetaldehyde is classified as a federal HAP and as a California TAC. Acetaldehyde is both directly emitted into the atmosphere and formed in the atmosphere from photochemical oxidation. Sources include combustion processes such as exhaust from mobile sources and fuel combustion from stationary internal combustion engines, boilers, and process heaters. In California, photochemical oxidation is the largest source of acetaldehyde concentrations in the ambient air. According to CARB (2009), approximately 85 percent of the emissions of acetaldehyde in the SJVAB are from mobile sources—primarily diesel-fueled. Areawide sources, such as residential wood combustion, account for approximately 10 percent. However, in general, acetaldehyde concentrations are higher indoors than outdoors, due in part to the abundance of combustion sources, such as cigarettes, fireplaces, and woodstoves.

The primary acute effect of inhalation exposure to acetaldehyde is irritation of the eyes, skin, and respiratory tract in humans. At higher exposure levels, erythema, coughing, pulmonary edema, and necrosis may also occur. Acute inhalation of acetaldehyde resulted in a depressed respiratory rate and elevated blood pressure in experimental animals. Tests involving acute exposure of rats, rabbits, and hamsters have demonstrated acetaldehyde to have low acute toxicity from inhalation and moderate acute toxicity from oral or dermal exposure.

Benzene

Benzene is highly carcinogenic and occurs throughout California. Benzene also has non-cancer-related health effects. The primary sources of benzene emissions in the SJVAB are mobile sources (approximately 67 percent) and stationary sources (approximately 32 percent). The mobile source emissions are primarily gasoline-fueled.

Brief inhalation exposure to high concentrations can cause central nervous system depression. Acute effects include central nervous system symptoms of nausea, tremors, drowsiness, dizziness, headache, intoxication, and unconsciousness. Neurological symptoms of inhalation exposure to benzene include drowsiness, dizziness, headaches, and unconsciousness in humans. Ingestion of large amounts of benzene may result in vomiting, dizziness, and convulsions in humans. Exposure to benzene in liquid and vapor form may irritate the skin, eyes, and upper respiratory tract in humans. Redness and blisters may result from dermal exposure to benzene.

Chronic inhalation of certain levels of benzene causes blood disorders in humans; specifically, benzene affects bone marrow (the tissues that produce blood cells). Aplastic anemia, excessive bleeding, and damage to the immune system (by changes in blood levels of antibodies and loss of white blood cells) may develop. Increased incidence of leukemia (cancer of the tissues that form white blood cells) has been observed in humans who have been occupationally exposed to benzene.

1,3-Butadiene (vinyl ethylene)

1,3-butadiene has been identified as a carcinogen in California. The majority of 1,3-butadiene emissions come from incomplete combustion of petroleum-based fuels. Mobile sources account for 48 percent of total SJVAB emissions. Area sources, such as agricultural waste burning, open burning associated with forest management, and woodstoves and fireplaces, contribute to approximately 27 percent. Since the majority of 1,3-butadiene emissions are from incomplete combustion of gasoline and diesel fuels, CARB's 1990 adopted low-emission vehicle/clean fuels regulations and the 1996 Phase II reformulated gasoline regulations are expected to continue to reduce 1,3-butadiene emissions from cars and light-duty trucks as the fleet turns over and new low-emission vehicles are introduced into the fleet.

At very high levels, butadiene vapors cause neurological effects, such as blurred vision, fatigue, headache, and vertigo. Dermal exposure of humans to 1,3-butadiene causes a sensation of cold, followed by a burning sensation, which may lead to frostbite.

One epidemiological study reported that chronic (long-term) exposure to 1,3-butadiene by inhalation resulted in an increase in cardiovascular diseases, such as rheumatic and arteriosclerotic

heart diseases, while other human studies have reported effects on the blood. A large epidemiological study of synthetic rubber industry workers demonstrated a consistent association between 1,3-butadiene exposure and occurrence of leukemia. Several epidemiological studies of workers in styrene-butadiene rubber factories have shown an increased incidence of respiratory, bladder, stomach, and lymphato-hematopoietic cancers. However, these studies are not sufficient to determine a causal association between 1,3-butadiene exposure and cancer, due to possible exposure to other chemicals and other confounding factors.

Carbon Tetrachloride (tetrachloromethane)

Carbon tetrachloride is a central nervous system depressant, which the EPA has classified as a Group B2, a probable human carcinogen. The primary sources of carbon tetrachloride in California include chemical and allied product manufacturers and petroleum refineries. Unlike many of the other TACs, carbon tetrachloride is emitted primarily by sources other than motor vehicles, and there are virtually no emissions within the SJVAB or California.

Acute inhalation and oral exposures to high levels of carbon tetrachloride have been observed primarily to damage the liver (swollen, tender liver, changes in enzyme levels, and jaundice) and kidneys (nephritis, nephrosis, proteinuria) of humans. Depression of the central nervous system has also been reported. Symptoms of acute exposure in humans include headache, weakness, lethargy, nausea, and vomiting. Delayed pulmonary edema (fluid in lungs) has been observed in humans who have been exposed to high levels of carbon tetrachloride by inhalation and ingestion, but this is believed to be due to injury to the kidney rather than direct action of carbon tetrachloride on the lung. Chronic inhalation or oral exposure to carbon tetrachloride produces liver and kidney damage in humans and animals.

Chromium, Hexavalent

Hexavalent chromium emissions come mainly from electric generation, aircraft and parts manufacturing, and fabricated metal produce manufacturing. In California, hexavalent chromium has been identified as a carcinogen. Epidemiological evidence suggests that exposure to inhaled hexavalent chromium may result in lung cancer.

The respiratory tract is the major target organ for chromium (VI) following inhalation exposure in humans. Other effects noted from acute inhalation exposure to very high concentrations of chromium (VI) include gastrointestinal and neurological effects, while dermal exposure causes skin burns in humans. Chronic inhalation exposure to chromium (VI) in humans results in effects on the respiratory tract, with perforations and ulcerations of the septum, bronchitis, decreased pulmonary function, pneumonia, asthma, and nasal itching and soreness reported. Chronic human exposure to high levels of chromium (VI) by inhalation or oral exposure may produce effects on the liver, kidney, gastrointestinal and immune systems, and possibly the blood.

para-Dichlorobenzene

In California, para-dichlorobenzene has been identified as a carcinogen. In addition to the carcinogenic impact, long-term inhalation exposure may affect the liver, skin, and central nervous

system in humans. Para-dichlorobenzene is a chlorinated aromatic hydrocarbon (NPIC 2010). It was first registered for use in the United States in 1942, and it is sometimes called 1,4-dichlorobenzene. It is a fumigant insecticide and repellent. Para-dichlorobenzene turns directly from a solid into a gas, a process called sublimation.

The primary sources of para-dichlorobenzene include consumer products such as non-aerosol insect repellents and solid/gel air fresheners. These sources contribute to 97 percent of SJVAB para-dichlorobenzene emissions.

People who have been exposed to para-dichlorobenzene have experienced nausea, vomiting, dizziness, fatigue, and headaches. Para-dichlorobenzene vapor can also irritate the eyes and nasal passages. It may also cause kidney and liver damage in pets.

Formaldehyde

Formaldehyde is both directly emitted into the atmosphere and formed in the atmosphere as a result of photochemical oxidation. Photochemical oxidation is the largest source of formaldehyde concentrations in California ambient air. Directly emitted formaldehyde is a product of incomplete combustion. One of the primary sources of formaldehyde is vehicular exhaust. In fact, approximately 76 percent of the formaldehyde emissions in the SJVAB are from mobile sources, of which the source is predominantly diesel-fueled. Formaldehyde is also used in resins, fumigants, and soil disinfectants, and it can be found in many consumer products as an antimicrobial agent.

The major toxic effects caused by acute formaldehyde exposure via inhalation are eye, nose, and throat irritation and effects on the nasal cavity. Other effects seen from exposure to high levels of formaldehyde in humans are coughing, wheezing, chest pains, and bronchitis. Chronic exposure to formaldehyde by inhalation in humans has been associated with respiratory symptoms and irritation of the eye, nose, and throat. Animal studies have reported effects on the nasal respiratory epithelium and lesions in the respiratory system from chronic inhalation exposure to formaldehyde.

Occupational studies have noted statistically significant associations between exposure to formaldehyde and increased incidence of lung and nasopharyngeal cancer. This evidence is considered to be “limited,” rather than “sufficient,” due to possible exposure to other agents that may have contributed to the excess cancers. The EPA considers formaldehyde to be a probable human carcinogen and has ranked it in EPA Group B1. In California, formaldehyde has been identified as a carcinogen.

Methylene Chloride (dichloromethane)

In California, methylene chloride has been identified as a carcinogen. In addition, chronic exposure can lead to bone marrow, hepatic, and renal toxicity. Methylene chloride is used as a solvent, a blowing and cleaning agent in the manufacture of polyurethane foam and plastic fabrication, and as a solvent in paint stripping operations. Approximately 80 percent of the SJVAB emissions of methylene chloride are from paint removers/strippers, automotive brake cleaners, and other consumer products. The statewide trend for methylene chloride shows that by comparing the

statewide average methylene chloride concentration for 1990 to 1992 to that for 2005 to 2007 the result is a 77 percent decrease in both concentration and health risk.

Case studies of methylene chloride poisoning during paint stripping operations have demonstrated that inhalation exposure to extremely high levels of methylene chloride can be fatal to humans. Acute inhalation exposure to high levels of methylene chloride in humans has affected the central nervous system including decreased visual, auditory, and psychomotor functions, but these effects are reversible once exposure ceases. Methylene chloride also irritates the nose and throat at high concentrations. The major effects from chronic inhalation exposure to methylene chloride in humans are effects on the central nervous system, such as headaches, dizziness, nausea, and memory loss. In addition, chronic exposure can lead to bone marrow, hepatic, and renal toxicity. The EPA considers methylene chloride to be a probable human carcinogen and has ranked it in EPA Group B2. The State of California considers methylene chloride to be a carcinogen.

Perchloroethylene (tetrachloroethylene)

In California, tetrachloroethylene (PERC) has been identified as a carcinogen. PERC vapors are irritating to the eyes and respiratory tract. Following chronic exposure, workers have shown signs of liver toxicity as well as kidney dysfunction and neurological disorders.

PERC is used as a solvent, primarily in dry-cleaning operations. PERC is also used in degreasing operations, paints and coatings, adhesives, aerosols, specialty chemical production, printing inks, silicones, rug shampoos, and laboratory solvents. In the SJVAB, approximately 65 percent of the emissions of PERC are from such stationary sources as dry-cleaning plants and manufacturers of aircraft parts and fabricated metal parts. Areawide sources contribute approximately 35 percent. In comparing the statewide PERC concentration for 1990 to 1992 to that for 2005 to 2007 the result is an 84 percent decrease in both concentration and health risk.

Breathing PERC for short periods can adversely affect the human nervous system. Effects range from dizziness, fatigue, headaches, and sweating to incoordination and unconsciousness. Contact with PERC liquid or vapor irritates the skin, eyes, nose, and throat. These effects are not likely to occur at levels of PERC that are normally found in the environment (EPA 1994).

Breathing PERC over longer periods can cause liver and kidney damage in humans. Workers exposed repeatedly to large amounts of PERC in air can also experience memory loss and confusion. Laboratory studies show that PERC causes kidney and liver damage and cancer in animals exposed repeatedly by inhalation and by mouth. Repeat exposure to large amounts of PERC in air may likewise cause cancer in humans.

Diesel Particulate Matter

Diesel exhaust and many individual substances contained in it (including arsenic, benzene, formaldehyde, and nickel) have the potential to contribute to mutations in cells that can lead to cancer. More than 40 diesel exhaust components are listed by the State and federal government as TACs or HAPs, respectively. In California, particulate emissions from diesel-fueled engines has been identified as a carcinogen (17 California Code of Regulations [CCR] § 93000). Most

researchers believe that diesel exhaust particles contribute the majority of the risk because the particles in the exhaust carry many harmful organics and metals.

DPM is emitted from both mobile and stationary sources. In the SJVAB, on-road diesel-fueled vehicles contribute approximately 61 percent of the total, with an additional 38 percent attributed to other diesel-fueled mobile sources such as construction and agricultural equipment.

Long-term exposure to diesel exhaust particles poses the highest cancer risk of any TAC evaluated by the California Office of Environmental Health Hazard Assessment (OEHHA). CARB estimates that about 70 percent of the cancer risk that the average Californian faces from breathing TACs stems from diesel exhaust particles.

In its comprehensive assessment of diesel exhaust, OEHHA analyzed more than 30 studies of people who worked around diesel equipment, including truck drivers, railroad workers, and equipment operators. The studies showed these workers were more likely than workers who were not exposed to diesel emissions to develop lung cancer. These studies provide strong evidence that long-term occupational exposure to diesel exhaust increases the risk of lung cancer. Using information from OEHHA's assessment, CARB estimates that diesel-particle levels measured in California's air in 2000 could cause 540 "excess" cancers (beyond what would occur if there were no diesel particles in the air) in a population of 1 million people over a 70-year lifetime (OEHHA 2002).

Other researchers and scientific organizations, including the National Institute for Occupational Safety and Health, have calculated similar cancer risks from diesel exhaust as those calculated by the OEHHA and CARB.

Exposure to diesel exhaust can have immediate health effects. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. In studies with human volunteers, diesel exhaust particles made people with allergies more susceptible to the materials to which they are allergic, such as dust and pollen. Exposure to diesel exhaust also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks.

Diesel engines are a major source of fine-particle pollution*, especially $PM_{2.5}$, which has specific health risks as noted previously in this section*. The elderly and people with emphysema, asthma, and chronic heart and lung disease are especially sensitive to fine-particle pollution.

Numerous studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among people suffering from respiratory problems. Because children's lungs and respiratory systems are still developing, they are also more susceptible than healthy adults to fine particles. Exposure to fine particles is associated with increased frequency of childhood illnesses and can reduce lung function in children. In California, diesel exhaust particles have been identified as carcinogens.

Polycyclic Aromatic Hydrocarbons

The term polycyclic aromatic hydrocarbons (PAHs) refers to a group of several hundred chemically related, environmentally persistent organic compounds of various structures and varied toxicity. Most of them are formed by a process of thermal decomposition (pyrolysis) and subsequent recombination (pyrosynthesis) of organic molecules. PAHs enter the environment through various routes and are usually found as a mixture containing two or more of these compounds (for example, soot). They have been shown to cause carcinogenic and mutagenic effects and are potent immunosuppressants. Effects have been documented on immune system development. They are byproducts of natural gas combustion.

Other Health Effects

Valley Fever

Valley Fever or coccidioidomycosis is one of the most studied and oldest known fungal infections. Coccidioidomycosis was first discovered in the early 1890s in Domingo Ezcurra, an Argentinean soldier, and in 1900 was established as a fungal disease. After an outbreak in the 1930s in the SJV of California, this disease was given its nickname "San Joaquin Valley Fever," often shortened further to "Valley Fever" (Los Angeles County Department of Health Services, Public Health 2004).

Valley Fever is primarily a disease of the lungs caused by inhalation of spores of the *Coccidioides immitis* fungus. The *Coccidioides* fungus resides in the soil in southwestern United States, northern Mexico, and parts of Central and South America. When weather and moisture conditions are favorable, the fungus "blooms" and forms many tiny spores that lie dormant in the soil. The spores are found in the top few inches of soil, become airborne when the soil is disturbed by wind, vehicles, excavation, or other ground-moving activities, and are subsequently inhaled into the lungs. After the fungal spores have settled in the lungs, they change into a multicellular structure called a spherule. Fungal growth in the lungs occurs as the spherule grows and bursts, releasing endospores, which then develop into more spherules.

Infection occurs when the spores of the fungus become airborne and are inhaled. The fungal spores become airborne when contaminated soil is disturbed by human activities, such as construction and agricultural activities, and natural phenomenon, such as windstorms, dust storms, and earthquakes.

Valley Fever symptoms generally occur within two to three weeks of exposure. Approximately 60 percent of Valley Fever cases are mild and display flu-like symptoms or no symptoms at all. The remainder developed flu-like symptoms (fatigue, cough, chest pain, fever, rash, headache, and joint aches) that can last for a month and tiredness that can sometimes last for longer than a few weeks. In some cases, painful red bumps may develop. A small percentage of infected people (<1 percent) can develop disseminated disease that spreads outside the lungs to the brain, bone, and skin. Without proper treatment, Valley Fever can lead to severe pneumonia, meningitis, and even death. Symptoms may appear between one to four weeks after exposure.

One important fact to mention is that these symptoms are not unique to Valley Fever and may be caused by other illnesses as well. Identifying and confirming this disease requires specific laboratory tests such as: (1) microscopic identification of the fungal spherules in the infected tissue, sputum, or body fluid sample; (2) growing a culture of *Coccidioides immitis* from a tissue specimen, sputum, or body fluid; (3) detecting antibodies (serological tests specifically for Valley Fever) against the fungus in blood serum or other body fluids; and (4) administering the Valley Fever skin test (called coccidioidin or spherulin), which indicates prior exposure to the fungus.

Valley Fever is not contagious and, therefore, cannot be passed from person to person. Most of those who are infected will recover without treatment within six months and will have a lifelong immunity to the fungal spores. In severe cases, such as patients with rapid and extensive primary illness, those who are at risk for dissemination of disease, and those who have disseminated disease, antifungal drug therapy is used. Only 1 percent to 2 percent of those exposed who seek medical attention will develop a disease that disseminates (spreads) to other parts of the body other than the lungs. Table 4.3-5 presents the various infection classifications and normal diagnostic spread of Valley Fever cases.

Table 4.3-5: Range of Valley Fever Cases

Infection Classification	Percent of Total Diagnosed Cases
Asymptomatic infections	60
Infections that resolve spontaneously (with lifelong immunity)	35
Chronic disease or disease disseminated throughout the body	Up to 5
Meningeal infection (affecting brain and/or spinal cord and requiring lifetime treatment)	0.15–0.75

Source: Hector 2005

Factors that affect the susceptibility to coccidioidal dissemination are race, sex, pregnancy, age, and immunosuppression. According to data gathered by the Kern County Public Health Services Department, Hispanic and Latino Americans are 3.4 times more likely than whites to develop coccidioidal dissemination, African Americans are 13.7 times more likely, and Filipinos are 175.5 times more likely. Regarding the number of deaths attributed to the disease, compared to whites, the number of Hispanic/Latino is five times greater; African Americans, 23.3 times greater; and Filipinos, 191.4 times greater. In addition, residents new to the SJV are at a higher risk of infection due primarily to low immunity to this particular fungus (see also KCPHS 2014; CDPH 2022).

Asbestos

Asbestos is the name given to a number of naturally occurring fibrous silicate minerals that have been mined for their useful properties such as thermal insulation, chemical and thermal stability, and high tensile strength. The three most common types of asbestos are chrysotile, amosite, and crocidolite. Ultramafic, serpentinized rock is closely associated with asbestos and is chemically composed of the following list of minerals:

- Antigorite, $(Mg, Fe)_3S\ i_2O_5(OH)_4$
- Clinochrysotile, $Mg_3S\ i_2O_5(OH)_4$
- Lizardite, $Mg_3S\ i_2O_5(OH)_4$
- Orthrochrysotile, $Mg_3Si_2O_5(OH)_4$
- Parachrsotile, $(Mg, Fe)_3Si_2O_5(OH)_4$

These minerals have essentially the same chemistry but different structures. Chrysotile minerals are more likely to form serpentinite asbestos; however, serpentinite is uncommon to sedimentary soil found in the proposed project area.

Asbestos can adversely affect humans only in its fibrous form, and these fibers must be broken and dispersed into the air and then inhaled. During geological processes (for example, fault movement), the asbestos mineral can be crushed, causing it to become airborne. It also enters the air or water from the breakdown of natural deposits. Constant exposure to asbestos at high levels on a regular basis may cause cancer in humans. The two most common forms of cancer are lung cancer and mesothelioma, a rare cancer of the lining that covers the lungs and stomach.

Chrysotile, also known as white asbestos, is the most common type of asbestos found in buildings. Chrysotile makes up approximately 90 to 95 percent of all asbestos contained in buildings in the United States. Project construction sometimes requires the demolition of existing buildings where construction occurs. Buildings often include materials containing asbestos. Most demolitions and many renovations are subject to an asbestos inspection prior to start of activity. The demolition, renovation, or removal of asbestos-containing building materials (ACBM) is subject to the limitations of the National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations as listed in the Code of Federal Regulations (CFR) requiring notification, inspection, and compliance with local air district regulations. The SJVAPCD requires compliance with NESHAP and has adopted Rule 4002.

In addition, asbestos is also found in a natural state. Exposure and disturbance of rock and soil that naturally contains asbestos can result in the release of fibers to the air and consequent exposure to the public. Asbestos most commonly occurs in ultramafic rock that has undergone partial or complete alteration to serpentine rock (serpentinite) and often contains chrysotile asbestos. In addition, another form of asbestos, tremolite, can be found associated with ultramafic rock, particularly near faults. Sources of asbestos emissions include unpaved roads or driveways surfaced with ultramafic rock, construction activities in ultramafic rock deposits, or rock quarrying activities where ultramafic rock is present.

To address some of the health concerns associated with exposure to asbestos from these activities, CARB has adopted two Airborne Toxic Control Measures (ATCMs). CARB has an ATCM for construction, grading, quarrying, and surface mining operations requiring the implementation of mitigation measures to minimize emissions of asbestos-laden dust. This ATCM applies to road construction and maintenance, construction and grading operations, and quarries and surface mines when the activity occurs in an area where naturally occurring asbestos is likely to be found. Areas

are subject to the regulation if they are identified on maps published by the California Department of Conservation as ultramafic rock units or if the Air Pollution Control Officer (APCO) or owner/operator has knowledge of the presence of ultramafic rock, serpentine, or naturally occurring asbestos on the site. The ATCM also applies if ultramafic rock, serpentine, or asbestos is discovered during any operation or activity.

In addition, CARB has an ATCM for surfacing applications. This ATCM applies to any person who produces, sells, supplies, offers for sale or supply, uses, applies, or transports any: (1) aggregate material extracted from property where any portion of the property is located in a geographic ultramafic rock unit; or (2) aggregate material extracted from property that is not located in a geographic ultramafic rock unit, if:

- The material has been evaluated at the request of the APCO and determined to be ultramafic rock or serpentine.
- Material tested at the request of the APCO is determined to have an asbestos content of 0.25 percent or greater or is determined by the owner/operator of a facility to be ultramafic rock or serpentine.
- The material has an asbestos content of 0.25 percent or greater.

The ATCM prohibits a person from using, applying, selling, supplying, or offering for sale or supply any restricted material for surfacing unless it has been tested and determined to have an asbestos content that is less than 0.25 percent.

Carbon Dioxide CO_2

Carbon dioxide is considered minimally toxic by inhalation and is classified as an asphyxiant, displacing the oxygen in air. Symptoms of CO_2 exposure may include headache and drowsiness. Individuals exposed to higher concentrations may experience rapid breathing, confusion, increased cardiac output, elevated blood pressure, and increased arrhythmias. Extreme CO_2 concentrations can lead to death by asphyxiation. (Mathews 2022; Appendix B-3)

Additionally, Carbon dioxide, along with several other compounds, is considered a greenhouse gas that is contributing to climate change. Discussion of carbon dioxide and other greenhouse gas is included in Section 4.8, Greenhouse Gas Emissions of this EIR.

Sensitive and Worker Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Land uses that can be considered sensitive receptors include residential communities, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Sensitive individuals with compromised immune systems, such as children and the elderly, may be exposed to emissions from the construction and operation of the project. Worker receptors refer to employees and locations where people work. Impacts on sensitive receptors are of particular concern, because they are the people most vulnerable to the effects of air pollution.

Odorous Compounds

Odor refers to the perception or sensation experienced when one or more volatilized chemical compounds come in contact with receptors on the olfactory nerves. Odorant refers to any volatile chemical in the air that is part of the perception of odor by a human. The difference in sensory and physical responses experienced by individuals is responsible for the significant variability in the individual sensitivity to the quality and intensity of an odorant.

4.3.3 Regulatory Setting

Air quality in the project area is addressed through the efforts of various federal, State, regional, and local government agencies. The agencies primarily responsible for improving the air quality within the county include the EPA, CARB, SJVAPCD, and the Kern Council of Governments (COG). These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policymaking, education, and a variety of programs. The agencies primarily responsible for improving the air quality within Kern County are discussed below, along with their individual responsibilities.

Federal

The principal air quality regulatory mechanism on the federal level is the CAA as amended in 1990 and, in particular, the NAAQS established by the EPA pursuant to the CAA. These standards identify levels of air quality for "criteria" pollutants that are considered the maximum levels of ambient (background) air considered safe, with an adequate margin of safety, to protect public health and welfare. The criteria pollutants include ozone, CO, NO_2, PM_{10}, $PM_{2.5}$, SO_2, which is a form of SO_X, and Pb. The EPA also has regulatory and enforcement jurisdiction over emission sources beyond state waters (outer continental shelf), and those that are under the exclusive authority of the federal government, such as aircraft, locomotives, and interstate trucking. The EPA's primary role at the state level is to oversee the State air quality programs. The EPA sets federal vehicle and stationary source emission standards and oversees approval of all State Implementation Plans (SIPs), as well as providing research and guidance in air pollution programs. The SIP is a state-level document that identifies all air pollution control programs within California that are designed to help the State meet the NAAQS.

Attainment defines the status of a given airshed with regard to NAAQS requirements. Airsheds not meeting these standards are classified as "nonattainment."

Title V and Extreme Designation

Title V of the federal CAA, as amended in 1990, creates an operating permits program for facilities classified as major emission sources. Major emission sources are those that emit pollutants above the major source threshold applicable to the location of the emission source. In general, major source thresholds are 100 tons per year for any criteria pollutant. However, this will vary depending on the attainment status of the source's location. In an ozone extreme nonattainment area, such as the project area, sources that emit more than 10 tons per year of NO_X and ROG are classified as

major sources for Title V permitting. This results in more businesses having to comply with Title V permitting requirements under the Extreme nonattainment designation.

Title V does not impose any new air pollution standards, require installation of any new controls on the affected facilities, or require reductions in emissions. Title V enhances public and EPA participation in the permitting process and requires additional recordkeeping and reporting by businesses, which results in significant administrative requirements.

EPA Emission Standards

The EPA establishes and maintains emission standards of performance of new stationary sources under CAA Section 111(b), as the New Source Performance Standards (40 CFR 60). Categories of existing stationary sources can also be retroactively controlled under CAA Section 111(d).

Categories of sources that cause HAP emissions are controlled through separate standards under CAA Section 112: NESHAP. These standards are specifically designed to reduce the potency, persistence, or potential bioaccumulation of toxic air pollutants. The emission standards for HAPs under CAA Section 112 prevent adverse health risks and carcinogenic effects from targeted types of facilities.

State

California Air Resources Board

CARB, a department of the California Environmental Protection Agency, oversees air quality planning and control throughout California by administering the SIP. Its primary responsibility lies in ensuring implementation of the 1989 California Clean Air Act (CCAA), responding to the federal CAA requirements, and regulating emissions from motor vehicles sold in California. It also sets fuel specifications to further reduce vehicular emissions.

The CCAA establishes a legal mandate to achieve many of the CAAQS by the earliest practical date. These standards apply to the same criteria pollutants as the federal CAA, and also include sulfate, visibility reducing particulates, H_2S, and vinyl chloride. They are also more stringent than the federal standards.

CARB is also responsible for regulations pertaining to TACs. The "Tanner Act," enacted in 1983, directed CARB to identify TACs and to adopt ATCMs to "reduce, avoid, or eliminate the emissions of a toxic air contaminant." To date, CARB has formally identified 21 TACs and has adopted 26 ATCMs (CARB 2015). The Air Toxics "Hot Spots" Information and Assessment Act (Assembly Bill [AB] 2588; Health & Safety Code §§ 44300 et seq.) was enacted in 1987 as a means to establish a formal air toxics emission inventory risk quantification program. AB 2588, as amended, establishes a process that requires stationary sources to report the type and quantities of certain substances their facilities routinely release into their air basin. Each air pollution control district ranks the data into high, intermediate, and low priority categories. When considering the ranking, the potency, toxicity, quantity, volume, and proximity of the facility to receptors are given consideration by an air district. AB 2588 was amended in 1992 by Senate Bill (SB) 1731, and

further modified by AB 564 in 1996. The goal of the Air Toxics "Hot Spots" Act, as amended, is to collect emission data indicative of routine predictable releases of toxic substances to the air, to identify facilities having localized impacts, to evaluate health risks from exposure to the emissions, to notify nearby residents of significant risks, and reduce risk below the determined level of significance (CARB 2014).

CARB also has on-road and off-road engine emission reduction programs that indirectly affect the project's emissions through the phasing in of cleaner on-road and off-road equipment engines. Additionally, CARB has a Portable Equipment Registration Program that allows owners or operators of portable engines and associated equipment to register their units under a statewide portable program to operate their equipment that must meet specified program emission requirements throughout California without having to obtain individual permits from local air districts.

The State has also enacted an ATCM for the reduction of DPM and criteria pollutant emissions from in-use, off-road, diesel-fueled vehicles (CCR Title 13, Article 4.8, Chapter 9, Section 2449). This regulation provides target emission rates for PM and NO_X emissions from owners of fleets of diesel-fueled off-road vehicles and applies to equipment fleets of three specific sizes and the target emission rates are reduced over time (CARB 2007).

Regulation of Air Pollution Transport between Air Basins

The CCAA directs CARB to assess the contribution of ozone and ozone precursors in upwind basins or regions to ozone concentrations that violate the State ozone standard in downwind basins or regions. The movement of ozone and ozone precursors between basins or regions is referred to as "transport." In addition, the CCAA directs CARB to establish mitigation requirements for upwind districts commensurate with their contributions to the air quality problems in downwind basins or regions.

Over the last decade, CARB has published several transport reports that include technical assessments of transport relationships between air basins and regions in California. Along with these technical assessments, the reports have included mitigation requirements to ensure that upwind areas do their part to limit the effects of transport on their downwind neighbors. CARB originally established mitigation requirements in 1990, which are contained in Title 17, CCR, Sections 70600 and 70601. These regulations were amended in 1993 and more recently in 2003. The 2003 amendments added two new requirements for upwind districts. These amendments require upwind districts to: (1) consult with their downwind neighbors and adopt "all feasible measures" for ozone precursors; and (2) amend their "no net increase" thresholds for permitting so that they are equivalent to those of their downwind neighbors. The amendments clarify that upwind districts are required to comply with the mitigation requirements, even if they attain the State ozone standard in their own district, unless the mitigation measures are not needed in the downwind district.

According to SJVAPCD, air pollution transported from the San Francisco Bay and Sacramento areas account for approximately 27 percent of the total emissions in the northern portion of the

SJVAPCD (San Joaquin, Stanislaus, and Merced Counties). In the Central region (Fresno, Madera, and Kings Counties), the percentage drops to 11 percent, and in the south valley (the valley portion of Kern and Tulare counties), transported air pollution accounts for only 7 percent of the total problem.

The Mojave Desert Air Basin (MDAB) includes the desert portions of Los Angeles, Kern, San Bernardino, and Riverside counties. Most of this area is commonly referred to as the "high desert," because elevations range from approximately 2,000 to 5,000 feet above sea level. The MDAB is characterized by extreme temperature fluctuations, strong seasonal winds, and clear skies. While the project limits do not extend into the Kern County portion of the MDAB, studies in the southern SJV, South Coast Air Basin, and other airsheds have included intensive ozone and meteorological measurements, tracer studies, and development of transport models (CARB 2009). The issue of ozone transport in the Kern County area has been studied for over 30 years. A study by Sonoma Technology (2006) recognized the significant ozone transport from the SJV into the Mojave Desert area through the Tehachapi Pass.

The topography and climate of Southern California combine to make the South Coast Air Basin an area with a high potential for air pollution, which constrains efforts to achieve clean air. During the summer months, a warm air mass frequently descends over the cool, moist marine layer produced by the interaction between the ocean's surface and the lowest layer of the atmosphere. The warm upper layer forms a cap over the cool marine layer and inhibits the pollutants in the marine layer from dispersing upward. In addition, light winds during the summer further limit ventilation. Furthermore, sunlight triggers the photochemical reactions which produce ozone, and this region experiences more days of sunlight than many other major urban areas in the nation (South Coast Air Quality Management District 2006). Transboundary ozone transport form Asia and its impact on air quality in the SJVAB is being further studied and increases in ozone levels due to transport have been confirmed (SJVAPCD 2013).

Assembly Bill 617

AB 617 (August 2017) directs CARB and all local air districts to take measures to protect communities disproportionately impacts by air pollution. The primary components of AB 617 include (1) community-level air monitoring; (2) a State strategy and community-specific emission reduction plans; (3) accelerated review of retrofit pollution control technologies on industrial facilities subject to Cap-and-Trade; (4) enhanced emission report requirements; and (5) increased penalty for polluter violations. Additionally, CARB may direct additional grant funding to communities determined to have the highest air pollution burdens.

In response to AB 617, CARB established the Community Air Protection Program. The Community Air Protection Program's focus is to reduce exposure in communities most impacted by air pollution. CARB staff has already begun working closely with local air districts, community groups, community members, environmental organizations, and regulated industries to develop a new community-focused action framework for community protection.

Local

San Joaquin Valley Air Pollution Control District

State law assigns much of the authority to regulate stationary, indirect, and area sources to local air pollution control and air quality management districts. The SJVAPCD has primary responsibility for regulating stationary sources of air pollution situated within its jurisdictional boundaries. To this end, the SJVAPCD implements air quality programs required by State and federal mandates, enforces rules and regulations based on air pollution laws, and educates businesses and residents about their role in protecting air quality. The SJVAPCD is responsible for regulating stationary, indirect, and area sources of air pollution in the SJVAB. The eight counties that comprise the SJVAPCD are divided into three regions: the Northern Region (Merced, San Joaquin, and Stanislaus counties), Central Region (Madera, Fresno, and Kings Counties), and Southern Region (Tulare County and SJV portion of Kern County).

The SJV (or portions thereof) is designated as nonattainment with respect to federal air quality standards for ozone and $PM_{2.5}$. The SJV has a maintenance plan for PM_{10} and for CO for the urbanized/metropolitan areas of Kern, Fresno, Stanislaus, and San Joaquin counties.

The SJVAPCD is responsible for managing and permitting existing, new, and modified sources of air emissions within its boundaries and also established the following rules and regulations to ensure compliance with local, State, and federal air quality regulations:

Rules and Regulations

The following SJVAPCD Rules and Regulations apply to the oil and gas production industry and its ancillary facilities.

Regulation I (General Provisions)

Regulation I (General Provisions) is a series of rules that establish the basic framework for interacting with the SJVAPCD including enforcement procedures, inspections, and source sampling requirements, and regulatory accountability.

Regulation II (Permits)

Rule 2010 (Permits Required) requires any person constructing, altering, replacing, or operating any source operation which emits, may emit, or may reduce emissions to obtain an Authority to Construct (ATC) or a Permit to Operate (PTO).

Rule 2092 (Standards for Permits to Operate) defines the conditions that must be met for an APCO to issue a PTO.

Rule 2201 (New and Modified Stationary Source Review Rule) provides for the review of new and modified Stationary Sources of air pollution and to provide mechanisms including emission offsets by which Authorities to Construct such sources may be granted, without interfering with the attainment or maintenance of Ambient Air Quality Standards; and ensure that no net increase

in emissions above specified thresholds from new and modified Stationary Sources of all nonattainment pollutants and their precursors occur.

Rule 2250 (Permit-Exempt Equipment Registration) is essentially an SJVAPCD rule designed to provide the SJVAPCD with oversight of equipment that would otherwise not require an air permit. According to the SJVAPCD's Permit-Exempt Equipment Registration (PEER) – Frequently Asked Questions document, "PEER is necessary to enforce the requirements of certain District prohibitory rules in which the emissions equipment is exempt from permitting requirements" (SJVAPCD 2008). Section 4.5 of Rule 2250 states that the District shall issue the PEER within 90 days of receipt of a completed application. Sections 4.7 and 4.8 of the rule specify that a PEER unit is neither transferable between locations or owners without an application for transfer. See Rule 3155 for information on fees relating to PEER units. Additionally, Rules 4702, 4307, and 4622 define different types of PEER units.

Rule 2280 (Portable Equipment Registration) provides the administrative requirements for permitting portable emissions units for operation in participating districts throughout the State of California, starting in Sections 4.0 to 4.13 of the rule. To register portable equipment, an application must be submitted to the district in which operation will first occur. The Applicant shall provide the administering district with all necessary emissions and engineering data to demonstrate compliance with Section 5 of this rule. Section 4.4 states that prior to issuing a permit for portable registration, the SJVAPCD will conduct an on-site inspection of the unit. There are several notification and reporting rules associated with portable equipment. Namely, Section 6.1 states that if a portable emissions unit remains at a location for more than 24 hours, the SJVAPCD must be notified within two calendar days, and Section 6.2 states that within 30 days after the end of every calendar quarter, the SJVAPCD must be provided with the level of activity (hours of operation) for the previous quarter, unless the equipment is a rental. Finally, Section 8.0 provides emissions limitation (the total NO_X, or VOCs emissions from a project shall not exceed 100 pounds during any one day, for each pollutant, and the total PM_{10} emissions from a project shall not exceed 150 pounds during any one day) and minimum distance requirements of 1,000 feet from kindergarten to 12th grade schools. The actual emissions from the unit, when operated as a registered portable emissions unit, as verified by recordkeeping as prescribed by this rule, shall not exceed 10 tons per year of any affected pollutant when operated in any participating district.

Rule 2410 (Prevention of Signification Deterioration) - Rule 2410 is triggered when obtaining construction permits for a new major stationary source and/or major modification to existing major stationary sources located in areas classified as "in attainment" or in areas that are unclassifiable for any criteria pollutant. The most important of the "Requirements" in Section 4.0 of Rule 2410 is that of Subsection 4.1 requiring that a Prevention of Significant Deterioration (PSD) permit be obtained prior to beginning any construction of a new major stationary source or a major modification to an existing major stationary source. Lastly, the SJVAPCD must follow the public notice requirements of Rule 2201 prior to issuing a federal PSD permit.

Rule 2520 (Federally Mandated Operating Permits) provides an administrative mechanism for issuing operating permits for new and modified sources of air contaminants in accordance with requirements of 40 CFR Part 70 (State Operating Permit Programs). Amended on August 15,

2019, this rule applies to major sources of air toxics, stationary sources with the potential to emit 100 tons per year or more of any air contaminant, a source that EPA determines is required to obtain a Part 70 permit upon promulgation of a standard issued pursuant to Section 111 or 112 of the CAA, sources required by the PSD program to have a preconstruction review, solid waste incinerators subject to Sections 111 or 129 of the CAA, and any source in a source category designated by the EPA pursuant to 40 CFR Part 70.3.

Rule 2540 (Acid Rain Program) incorporates the Acid Rain Standards from Part 72, Title 40 CFR and is applicable to all stationary sources subject to Part 72, Title 40, CFR.

Rule 2550 (Federally Mandated Preconstruction Review for Major Sources of Air Toxics) applies to applications to construct or reconstruct a major air toxics source with an ATC issued on or after June 28, 1998. Section 5.0 of Rule 2550 requires the application of toxic best available control technology to new major air toxic sources and sources with the potential to emit in excess of a major air toxic source threshold. Section 6.1 requires an application for ATC for major air toxic sources subject to the requirements of SJVAPCD Rule 2201.

Regulation III (Fees)

Regulation III sets the fees associated with owning and operating facilities, activities, and equipment that have the potential to emit air pollutants in the SJV. This rule was last amended on July 1, 2019.

Regulation IV (Prohibitions)

Rule 4001 (New Source Performance Standards) applies to all new sources of air pollution and modifications of existing sources of air pollution within the source categories for which EPA has adopted standards. Section 4.0, Requirements, of Rule 4001 lists all of the provisions of 40 CFR Part 60 that are incorporated into the NSPS.

Rule 4002 (National Emission Standards for HAPs). In the event that any portion of an existing building would be renovated, partially demolished, or removed, the project will be subject to SJVAPCD Rule 4002. Prior to any demolition activity, an asbestos survey of existing structures on the project site may be required to identify the presence of any ACBM. Any identified ACBM having the potential for disturbance must be removed by a certified asbestos contractor in accordance with California Occupational Safety and Health Administration (Cal/OSHA) requirements.

Rule 4101 (Visible Emissions) prohibits the emission of visible air contaminants into the atmosphere and applies to any source operation with the potential to emit air contaminants. Sections 4.0 to 4.12 list the following exemptions: fires set by a permitted public officer (such as those for the instruction of fighting fire), orchard or citrus grove heater that produces less than one gram per minute unconsumed solid carbonaceous matter, hazard reduction burning, aircraft distribution of agricultural aids over lands devoted to agriculture, open outdoor fires used for cooking and/or recreation, emissions from equipment used for the instruction/certification of individuals in visible emissions, wet plumes where the presence of uncombined water is the only reason for the failure

of an emission to meet rule limitations, emissions from maritime vessels using steam boilers during emergency boiler shutdowns for safety reasons, the use of an obscurant for the purpose of training military personnel and the testing of military equipment by the U.S. Department of Defense, and emissions specifically exempt from Regulation VIII. Sections 5.0 to 5.2 require that there be no discharge from a single source of emission for a period or periods aggregating more than 3 minutes in any 1 hour that is as dark or darker than a designated Ringelmann No. 1 rating by the U.S. Bureau of Mines, or of opacity that can obscure an observers view equal to or greater than the Ringelmann No. 1 rating.

Rule 4102 (Nuisance) applies to any source operation that emits or may emit air contaminants or other materials. In the event that the project or construction of the project creates a public nuisance, it could be in violation and be subject to SJVAPCD enforcement action.

Rule 4201 (Particulate Matter Concentration) sets a standard maximum of 0.1 grain per cubic foot of gas at dry standard conditions for PM emissions. This rule applies to any source operation that emits dust, fumes, or total suspended PM.

Rule 4202 (Particulate Matter – Emission Rate) establishes allowable emissions rates for PM. This rule requires any source operation that may emit PM emissions to meet the standards set forth in the table "Allowable Emission Rate Base on Process Weight Rate."

Rule 4651 (Soil Decontamination Operations) limits the emissions of VOCs from soil that has been contaminated with a VOC-containing liquid and applies to operations involving the excavation, transportation, handling, decontamination, and disposal of contaminated soil. Exempt from this rule is the excavation, handling, transportation, and decontamination of less than 1 cubic yard of contaminated soil per occurrence, operations related to the accidental spillage of 5 gallons or less of VOC-containing liquid per occurrence, contaminated soil exposed for the sole purpose of sampling, and soil contaminated solely by a known VOC-containing liquid or petroleum liquid that has an initial boiling point of 320°F. Rule requirements in Section 5.0 of this rule span written notices, monitoring, handling, storage, transportation, and decontamination.

Regulation V (Procedure Before the Hearing Board)

Regulation V (Procedure Before the Hearing Board) establishes the procedures in which an owner/operator can approach the Hearing Board to file petitions for variances from regulations.

Regulation VI (Air Pollution Emergency Contingency Plan)

Regulation VI (Air Pollution Emergency Contingency Plan) establishes a plan of action to be taken to prevent air pollutant concentration from reaching levels that could endanger the public health or to abate such concentrations should they occur.

Regulation VII (Toxic Air Pollutants)

Rule 7050 (Asbestos - Containing Material for Surfacing Applications). The purpose of this rule is to control airborne emissions of asbestos-containing rock. Compliance schedule,

recordkeeping, and test methods are specified. This rule incorporates provisions of the CCR Section 93106.

Regulation VIII (Fugitive PM_{10} Prohibitions)

Regulation VIII (Fugitive PM_{10} Prohibitions) is a series of rules to reduce ambient concentrations of PM_{10} by requiring actions to prevent, reduce, or mitigate anthropogenic fugitive dust emissions.

Rule 8021 (Construction, Demolition Excavation, Extraction, and Other Earthmoving Activities) limits fugitive dust emissions from construction, demolition, excavation, extraction, and other earthmoving activities and applies to any construction, demolition, excavation, extraction, and other earthmoving activities, including land clearing, grubbing, scraping, travel on site, and travel on access roads to and from the site.

Rule 8031 (Bulk Materials) limits fugitive dust emissions from the outdoor handling, storage, and transport of bulk materials and applies to the outdoor handling, storage, and transport of any bulk material.

Rule 8041 (Carryout and Trackout) prevents or limits fugitive dust emissions from carryout and trackout and applies to all sites that are subject to any of the following rules where carryout or trackout has occurred or may occur on paved public roads or the paved shoulders of a paved public road.

Rule 8051 (Open Areas) limits fugitive dust emissions from open areas and applies to any open area having 0.5 acre or more within urban areas, or 3.0 acres or more within rural areas; and contains at least 1,000 square feet of disturbed surface area.

Rule 8061 (Paved and Unpaved Roads) limits fugitive dust emissions from paved and unpaved roads by implementing control measures and design criteria.

Rule 8071 (Unpaved Vehicle/Equipment Traffic Areas) limits fugitive dust emissions from unpaved vehicle and equipment traffic areas.

Regulation IX (Mobile and Indirect Sources)

Rule 9410 (Employer-Based Trip Reduction) reduces vehicle miles traveled from private vehicles used by employees to commute to and from their worksites to reduce emissions of NO_X, VOC, and PM.

Rule 9510 (Indirect Source Review). Indirect sources are land uses that attract or generate motor vehicles trips. Indirect source emissions contain many pollutants, principally PM_{10}, ROG, and NO_X. The SJVAPCD first implemented this requirement in the adopted 2003 PM_{10} Plan to develop and implement an Indirect Source Rule (ISR) by July 2004, with implementation to begin in 2005. Senate Bill 709 (SB 709) as required the SJVUAPCD to adopt by regulation a schedule of fees to be assessed on areawide and indirect sources of emissions. After public hearings, the Air District

adopted Rule 9510 on December 15, 2005, and it became effective in 2006. This rule was amended on December 21, 2017, and the amendments came into effect on March 21, 2018.

The purpose of Rule 9510 is to reduce emissions of NO_X and PM_{10} from new development projects. The District determined that reducing one precursor NO_X, would reduce the cumulative impact on ozone form new development to less than significant levels. Sufficient ROG was obtained from other control measures to enable the District to predict attainment without additional ROG controls. The rule applies to development projects that seek to gain a discretionary approval for projects that, upon full buildout, will include any one of the following: 50 residential units; 2,000 square feet of commercial space; 25,000 square feet of light industrial space; 20,000 square feet of medical or recreational space; 39,000 square feet of general office space; 100,000 square feet of heavy industrial space; 9,000 square feet of educational space; 10,000 square feet of government space; or 9,000 square feet of any land use not identified above. Several sources are exempt from the rule, including transportation projects, transit projects, reconstruction projects that result from a natural disaster, and development projects whose primary source of emissions are subject to district Rules 2201 and 2010, which address stationary sources. Any development project that has a mitigated baseline of less than 2 tons per year for each NO_X and PM_{10} is exempted from the mitigation requirements of the rule as well as Oil and Gas activities (which involve development projects on facilities whose primary functions are subject to Rule 2201 [New and Modified Stationary Source Review Rule] or Rule 2010 [Permits Required]). Developers are encouraged to reduce as much air pollution as possible through on-site mitigation or incorporating air-friendly designs and practices into the project. Some examples include bike paths and sidewalks, traditional street design; medium- to high-density residential developments; locating near bus stops and bike paths; locating near different land use zones, such as commercial; and increasing energy efficiency. If these practices do not completely meet the required reductions, then under the rule, new development projects are required to mitigate the remainder of their emissions by contributing to a mitigation fund that would be used to pay for the most cost-effective projects to reduce emissions. Examples of such projects include retirement and crushing of gross polluting cars, replacement of older diesel engines, and diesel-powered vehicles and programs that would encourage the replacement of gas-powered lawn mowers with electric lawn mowers.

The ISR requires developers to reduce 20 percent of construction-exhaust NO_X, 45 percent of construction-exhaust PM_{10}, 33 percent of operational NO_X over 10 years, and 50 percent of operational PM_{10} over 10 years. The District estimates that the potential reductions from this program in 2010 at 11.5 tons per day, or 4,197.5 tons per year, of PM_{10} and 4.1 tons per day, or 1,496.5 tons per year, of NO_X.

Emission Reduction Agreements

The implementation, as mitigation, of a Development Mitigation Contract or Voluntary Emission Reduction Agreement (VERA) to reduce criteria pollutants of NO_X, ROGs, and PM net incremental emissions generated by a project has been incorporated into development projects in Kern County since 2008. They are not a "voluntary" agreement with the SJVAPCD but are mandated by enforceable mitigation measures and are, therefore, called Development Mitigation Contracts (DMC). The emission reductions required by a DMC are implemented within the

SJVAB in quantities sufficient to fully mitigate the project's air quality impacts such that development of the project could be considered to result in no net increase in the designated criteria pollutant emissions over the criteria pollutant emissions that would otherwise exist without the development of the project, all to be verified by the SJVAPCD. Thus, the DMC results in greater reductions than would otherwise occur under the District's ISR, since the ISR does not require ROG reductions and the ISR only requires a percentage of reductions rather than full reductions of NO_X and PM resulting from project construction and operations. When adopting the ISR and the subsequent VERA/DMC programs, the District acknowledges that as ROG is a precursor to ozone, the reductions are not required in the ISR. In the VERA/DMC, the reductions are achieved by increasing the NO_X and PM tonnage for project levels (SJVAPCD 2005). As the actual amount of ROG reductions achieved from NO_X and PM reductions is not absolutely certain, project emissions are still considered significant and unavoidable; however, all feasible and reasonable mitigation has been required to reduce criteria pollutants as close to "no net increase" as scientifically possible. This approach has been found legally sufficient by court rulings in the following cases; California Building Industry Assn. v. SJV APCD, Fresno County Case No. 06 CECG 02100 DS13. National Association of Home Builders v. San Joaquin Valley Unified Air Pollution Control District; Federal District Court, Eastern District of California, Case No. 1:07-CV-00820-LJO-DLB; and Center for Biological Diversity et al. v Kern County, Fifth Appellate District, Case No. F061908.

Local Control Measures

The SJVAPCD requires all local governments within its eight-county jurisdiction to adopt resolutions as part of the Ozone Attainment Demonstration Plan that must be approved by EPA. The resolutions describe the reasonably available control measures that each jurisdiction will implement to reduce ozone-causing emissions into the air from transportation sources. Local jurisdictions are also required to adopt best available control technology measures to reduce particle emissions as part of the PM_{10} Area Attainment Demonstration Plan. This process is coordinated and assisted by regional transportation planning agencies, such as the Kern COG.

The Kern County Board of Supervisors adopted a resolution on March 12, 2002, that committed the County to implementing several measures to reduce ozone-causing emissions. Among the measures are cost incentives for road contractors to minimize land closures, transit-oriented land use planning, and measures to encourage County employees and other motorists to restrict driving on days with high ozone levels as well as continuing efforts to convert County vehicles to low-emission compressed natural gas and gasoline/electric hybrid engines. Many of these measures have been incorporated as general plan policies.

The Kern County Board of Supervisors adopted a resolution on January 7, 2003, that committed the committed the County to implement several measures aimed at reducing PM_{10} emissions from County roadways. Among the measures are plans to determine the feasibility of paving the County's unpaved roads, which are lightly traveled; paving the shoulders of the most heavily traveled paved County roads as funding allows; and purchasing two PM_{10}-compliant street sweepers as funding allows. The resolution also committed the County to imposing tougher rules for canceling road improvements on large rural parcels; requiring public and private access roads

for new commercial and industrial development to be paved; evaluating the adverse air quality impacts of new development and, where appropriate, requiring mitigation measures; implementing policies that require developers to control and abate dust during grading and construction operations; and to receive a permit for expansion or a significantly altered use, requiring unpaved parking and storage areas of commercial and agricultural operations in county areas to be paved. These measures are being implemented through the Kern County Land Division Ordinance, Kern County Zoning Ordinance (Zoning Ordinance), and in the approved General Plan.

Air Quality Plans

The SJVAPCD has developed plans to attain State and federal standards for ozone and PM. The District's air quality plans include emissions inventories to identify the sources and quantities of air pollutants, to evaluate how well different control methods have worked, and to demonstrate how air pollution will be reduced. The plans also use computer modeling to estimate future levels of pollution and make sure that the Valley will meet air quality goals. The SJVAPCD's attainment plans are subject to approval by the SJVAPCD's Governing Board. At the time of this writing, the following attainment plans were in effect.

The adopted plans include emissions inventories, projected changes in population, vehicles, fuels and equipment, and associated emissions. The plans then identify existing rules and additional proposed measures required to reduce emissions to the ambient air quality standards. These rules and proposed measures include requirements to obtain permits to construct and operate, and rules regulating the allowable emissions from various activities or classes of equipment.

One-Hour Ozone Plan

CARB submitted the 2004 Extreme Ozone Attainment Demonstration Plan to the EPA on November 15, 2004. The plan was amended by the District in 2008. Effective June 15, 2005, the EPA revoked the federal 1-hour ozone ambient air quality standard, finding that the 8-hour ozone standard was more health protective and adopted anti-backsliding provisions to preserve existing 1-hour ozone control measure and emissions reductions obligations; this delayed EPA action on the District's 2004 Plan until 2010. The SJVAPCD implemented the 2004 plan's control measures and emissions reductions strategies, and the Valley must still attain the revoked standard before it can rescind the CAA Section 185 fees collected under Rule 3170.

In 2012, the EPA withdrew its 2010 approval of the SJVAPCD's 2004 Plan and required submittal of a new plan for the revoked 1-hour standard that includes the following:

- A Rate of Progress demonstration
- Contingency measures for Rate of Progress and for attainment
- An attainment demonstration
- A demonstration for Reasonably Available Control Measures
- A demonstration for clean fuels/clean technologies are in place for boilers

- A vehicle miles traveled offset demonstration

The SJVAPCD's Governing Board adopted the 2013 Plan for the Revoked 1-Hour Ozone Standard in September 2013, thereby fulfilling air quality planning requirements under the federal CAA for the Revoked 1-Hour Ozone Standard. The District Governing Board also requested the EPA to set 2017 as the attainment date for the revoked 1-hour ozone NAAQS, adopted in 1979.

On July 13, 2015, the SJVAPCD submitted a second formal request that the EPA determine that the Valley has attained the federal 1-hour ozone standard, allowing nonattainment penalties to be lifted under federal CAA Section 179B.

On July 18, 2016, the EPA published in the Federal Register a final action determining that the SJV has attained the 1-hour ozone NAAQS. This determination was based on the most recent three-year period (2012 to 2014) of sufficient, quality-assured, and certified data (SJVAPCD n.d.[a]).

Eight-Hour Ozone Plan

In June 2016, the District adopted the 2016 Plan, addressing the federal mandates related to the 2008 8-hour ozone NAAQS. The 2016 Ozone Plan sets out the strategy to attain the 75 parts per billion (ppb) standard by 2031, ensuring expeditious attainment of the CAA. This requires another 207.7 tons per day in NO_X reductions from stationary and mobile sources throughout the SJV. The measures identified in this plan were designed to achieve the necessary reductions (SJVAPCD 2016).

CARB approved the plan on July 21, 2016. In response to court decisions, some elements included in the 2016 Ozone Plan required updates. CARB staff prepared the 2018 Updates to the California SIP (2018 SIP Update) to update SIP elements for nonattainment areas throughout the State as needed. CARB adopted the 2018 SIP Update on October 25, 2018 (CARB 2019). In December 2022, the District adopted the 2022 Plan, addressing the federal mandates related to the 2008 8-hour ozone NAAQS. The 2022 Ozone Plan sets out the strategy to attain the 75 ppb standard by 2037 (SJVACPD 2016b). The plan has been submitted to CARB for approval.

PM_{10} Maintenance Plan

Based on PM_{10} measurements from 2003 to 2006, the EPA found that the SJVAB has reached federal PM_{10} standards. On September 21, 2007, the SJVAPCD adopted the 2007 PM_{10} Maintenance Plan and Request for Redesignation. This plan demonstrates that the Valley will continue to meet the PM_{10} standard. The EPA approved the document and on September 25, 2008, the SJVAB was redesignated to attainment for PM_{10} NAAQS.

2008 $PM_{2.5}$ Plan

The SJVAB is designated nonattainment for federal $PM_{2.5}$ standards. The EPA set their first $PM_{2.5}$ standards in 1997, and they strengthened the 24-hour standard in 2006. The SJVAPCD's Governing Board adopted the 2008 $PM_{2.5}$ Plan on April 30, 2008. The plan estimated that the SJVAB would reach the $PM_{2.5}$ standard by 2014. CARB approved the Plan on May 22, 2008. The EPA approved most provisions of the 2008 $PM_{2.5}$ Plan effective January 9, 2012.

2012 $PM_{2.5}$ Plan

The SJVAPCD adopted the 2012 $PM_{2.5}$ Plan on December 20, 2012. The plan demonstrated that the SJVAB would achieve the 2006 24-hour $PM_{2.5}$ NAAQS of 35 micrograms per cubic meter ($\mu g/m^3$) by 2019. CARB approved the SJVAPCD's 2012 $PM_{2.5}$ Plan in January 2013. The EPA approved most provisions of the 2012 $PM_{2.5}$ Plan effective August 31, 2016.

2015 $PM_{2.5}$ Plan

The SJVAPCD adopted the 2015 $PM_{2.5}$ Plan for the 1997 $PM_{2.5}$ standard in April 2015. While nearly achieving the 1997 standards by 2014, as predicted in the 2008 $PM_{2.5}$ Plan, the SJVAB experienced higher $PM_{2.5}$ levels in winter 2013 to 2014 due to the extreme drought, stagnation, strong inversions, and historically dry conditions; thus, the SJVAB was unable to meet the attainment date of December 31, 2015. Accordingly, the plan asked for a one-time extension of the attainment deadline for the 24-hour standard to 2018 and the annual standard to 2020.

The 2015 $PM_{2.5}$ Plan builds on past development and implementation of effective control strategies and, consistent with EPA regulations for $PM_{2.5}$, planned to achieve the 1997 standard as expeditiously as possible. The plan contains Most Stringent Measures, Best Available Control Measures, and additional enforceable commitments to further reduce emissions to ensure expeditious attainment of the 1997 standard.

The EPA formally proposed to approve portions of the 2015 $PM_{2.5}$ Plan and the attainment date extension on February 9, 2016. The EPA needed to finalize its approval of the SJVAPCD's attainment date extension by July 2016, but the EPA failed to finalize this action. The EPA subsequently denied the SJVAPCD's attainment extension request on the basis that they did not have enough information to act and found that the SJVAPCD failed to attain the 1997 standard by its December 2015 attainment deadline. The EPA's action was effective December 23, 2016.

2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard

The SJVAPCD adopted the 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard on September 15, 2016. This plan addresses the EPA federal annual $PM_{2.5}$ standard of 12 $\mu g/m^3$, established in 2012. This plan includes an attainment impracticability demonstration and request for reclassification of the SJVAB from moderate nonattainment to serious nonattainment.

2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards

The SJVAPCD adopted the 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards on November 15, 2018. This plan addresses the EPA federal 1997 annual $PM_{2.5}$ standard of 15 $\mu g/m^3$ and 24-hour $PM_{2.5}$ standard of 65 $\mu g/m^3$; the 2006 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$; and the 2012 annual $PM_{2.5}$ standard of 12 $\mu g/m^3$. The plan demonstrates attainment of the $PM_{2.5}$ standards, as expeditiously as possible, with estimates that the EPA federal 1997 annual $PM_{2.5}$ standard of 15 $\mu g/m^3$ and 24-hour $PM_{2.5}$ standard of 65 $\mu g/m^3$ will be attained by 2020, the 2006 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ will be attained by 2024, and the 2012 annual $PM_{2.5}$ standard of 12 $\mu g/m^3$ will be attained by 2025. CARB approved the SJVAPCD's 2018 $PM_{2.5}$ Plan in January 2019. The Plan is currently being considered for approval by the EPA.

The SJVAPCD attainment strategy builds on comprehensive strategies already in place from previously adopted attainment plans and measures. The SJVAPCD's multifaceted approach to reducing emissions in the SJVAB for this Plan consists of a combination of innovative regulatory and non-regulatory measures (SJVAPCD 2018).

As of 2016, the SJVAPCD's Bakersfield, Visalia, Fresno, and Stockton $PM_{2.5}$ monitoring sites have all achieved the EPA 24-hour $PM_{2.5}$ standard of 65 µg/m³ (CARB 2019). However, as explained in Table 4.3-2, the SJVAPCD remains nonattainment for $PM_{2.5}$ and further reductions are needed to meet the federal 1997 annual $PM_{2.5}$ standard of 15 µg/m³, the 2006 24-hour $PM_{2.5}$ standard of 35 µg/m³ and the 2012 annual $PM_{2.5}$ standard of 12 µg/m³.

Air Quality Conformity Determination for Transportation Plans and Programs

The CAA amendments of 1990 require a finding to be made stating that any project, program, or plan subject to approval by a metropolitan planning organization conforms to air plans for attainment of air quality standards. Kern COG is designated the Regional Transportation Planning Agency and Metropolitan Planning Organization for Kern County. In that capacity, Kern COG models air quality projections on population projections in conjunction with current general plan designations and estimated vehicle miles as well as the current Regional Transportation Plan (RTP) and the federal transportation plan for Kern County finalized in 2022. Kern County is contained within two air basins: the SJVAB and the MDAB. Each air basin has its own plans and pollutant budgets. Kern COG makes conformity findings for each air basin. The Federal Transportation Improvement Program (FTIP) for the Kern County region is a six-year schedule of multimodal transportation improvements, and the RTP is a long-range, 24-year transportation and sustainability plan.

The Conformity Analysis for the 2023 FTIP and 2022 RTP was adopted by Kern COG November 16, 2022, and approved by the Federal Highway Administration and the Federal Transit Administration on December 16, 2022. The regional emissions analysis was conducted for years ranging from 2022 to 2046 for analysis years applicable to each pollutant. The conformity findings conclude that the FTIP and RTP result in emissions that are less than the emission budgets of baseline emissions or approved trading mechanisms for transportation conformity purposes for CO, VOC, NO_X, $PM_{10,}$ and $PM_{2.5}$ (FHWA 2022).

Guide for Assessing and Mitigating Air Quality Impacts/Air Quality Thresholds of Significance

In August 1998, the SJVAPCD adopted its Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI) to provide lead agencies, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents. The District subsequently revised its GAMAQI document in January 2002 (SJVAPCD 2002). In 2012, the SJVAPCD began the process to update its GAMAQI document. The update was intended to codify long-standing district practices, provide updated data, revise recommended significance thresholds, and provide additional technical guidance. The May 2012 Draft GAMAQI is more environmentally protective than the January 2002 GAMAQI. In March 2015, the SJVAPCD again updated the GAMAQI. This

document utilizes the significance thresholds recommended in its March 2015 Final GAMAQI (SJVAPCD 2015).

In December 2006, the Kern County Planning and Natural Resources (KCPNR) issued its own Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Reports (Kern County Air Quality Assessment Guidelines). The document provided specific guidance for County-prepared environmental impact reports, including air quality issues to be considered, analytical approaches and resources, a significance threshold for PM_{10} (which was not reflected in the January 2002 GAMAQI, but is included in the March 2015 Final GAMAQI), and a cumulative impact analysis methodology (KCPD 2006). This analysis also utilizes the analytical approach and issues recommended in the KCPNR's Guidelines.

Criteria Pollutant Emissions

Table 4.3-6 presents the SJVAPCD's criteria pollutant emissions significance thresholds for construction and project operation, based on the District's Final March 2015 GAMAQI. As shown in Table 4.3-6, the SJVAPCD recommends that emissions from permitted sources and activities be evaluated separately from non-permitted sources and activities.

Table 4.3-6: Criteria Pollutant Emissions Significance Thresholds (tons per year)

Pollutant/Precursor	Construction Emissions	Operational Emissions	
		Permitted Sources and Activities	Non-Permitted Sources and Activities
ROG	10	10	10
NO_X	10	10	10
PM_{10}	15	15	15
$PM_{2.5}$	15	15	15
CO	100	100	100
SO_X	27	27	27

Source: SJVAPCD 2015, Section 8.3.
Key:
CO = carbon monoxide
NO_X = oxides of nitrogen
PM_{10} = particulate matter less than 10 microns
$PM_{2.5}$ = particulate matter less than 2.5 microns
ROG = reactive organic gases
SO_X = sulfur oxides

As indicated in the 2015 GAMAQI, permitted sources and activities are subject to SJVAPCD Regulation II (Permits), notably Rule 2201 (New and Modified Stationary Source Review) and Rule 2301 (Emission Reduction Credit Banking). Rule 2201 requires that any emission increases from new permitted stationary sources are mitigated by emission trade-offs, which can include Emission Reduction Credits (ERCs), emission reductions due to control measures, or other decreases in emissions at a facility site (such as shutting down other equipment). In most cases,

permitted stationary source emissions, therefore, will be reduced or mitigated to below the SJVAPCD's recommended significance thresholds (SJVAPCD 2015, Section 8.2.1).

While CARB recently performed an audit of the SJVAPCD ERC Banking Program, CARB did not overturn the program (CARB 2020a, 2020b). Subsequently, the SJVAPCD Board approved staff recommendations to remove Ag-ICE projects from the NO_X ERC equivalency system and to remove orphan shutdown projects from the VOC ERC equivalency system, effective September 17, 2020 (SJVAPCD 2020). This action means that the SJVAPCD cannot demonstrate federal equivalency with the surplus value test for NO_X and VOC and thus any new major source or federal major modification triggering NO_X or VOC offsets under Rule 2201 will require "surplus at time of use" ERCs, which means ERCs must be demonstrated to be surplus at the time an ATC is issued, rather than when the emission reductions began. This process will remain in place until such time that equivalency with the federal program is again demonstrated by the SJVAPCD. This step by the SJVAPCD thus restricts the allowable number of ERCs that are valid for use as offsets in the Valley but does not change the way that ERCs are used, nor does it change permitting requirements under Rule 2201. Thus, permitted stationary sources will only be allowed to move forward and be permitted by the SJVAPCD if emissions are properly offset and if the SJVAPCD approves an ATC, as required by Rule 2201. Therefore, it is reasonable to assume that permitted stationary source emissions will continue to be offset under SJVAPCD rules and reduced or mitigated to below SJVAPCD's recommended significance thresholds.

Odors

The SJVAPCD recommends that lead agencies assess odor significance based on a review of District complaint records. For a project locating near an existing source of odors, the impact is potentially significant when the project site is at least as close as any other site that has already experienced significant odor problems related to the odor source. Significant odor problems are defined as follows:

- More than one confirmed complaint per year averaged over a three-year period, or
- Three unconfirmed complaints per year averaged over a three-year period

A complaint is deemed unconfirmed if the odor/air contaminant release could not be detected, or the source/facility cannot be determined.

The Kern County Air Quality Assessment Guidelines recommend dispersion modeling of maximum 24–hour average concentrations of odorous compounds at the project boundary and within a 6-mile limit to determine ambient concentrations at nearby sensitive receptors (for example, residences and schools), including approved, but not constructed sensitive receptors. Ambient concentrations at such receptors should be compared to odor thresholds and CEQA impact thresholds to determine potential odor impacts.

Air Toxic Program

In the context of TACs, to meet the requirements of federal and State law, the SJVAPCD has created an Integrated Air Toxic Program. This program serves as a tool for implementation of the

requirements outlined in Title III of the 1990 CAA Amendments and the TAC-related requirements of State law and District regulations. The goals of SJVAPCD risk management efforts are to (1) minimize increases in toxic emissions associated with new and modified sources of air pollution, and (2) ensure that new and modified sources of air pollution do not pose unacceptable health risks at nearby residences and businesses.

To achieve these goals, the SJVAPCD reviews the risk associated with each permitting action where there is an increase in emissions of TACs. SJVAPCD staff, as part of the engineering evaluation for these projects, performs this risk management review. The risk management review is performed concurrently with other project review functions necessary to process permit applications with the SJVAPCD.

Under the Agency's risk management policy, toxic best available control technology must be applied to all units that, based on their potential emissions may pose greater than de minimis risks. Facilities that pose health risks above SJVAPCD action levels are required to submit plans to reduce their risk. Action levels for risk were established in the SJVAPCD's Board-Approved Health-Risk Reduction Strategy (HRRS). The action level for cancer risk was 10 cases per 1 million exposed people, based on the maximum exposure beyond facility boundaries at a residence or business. Following changes to the State Health Risk Assessment (HRA) Guidelines (discussed in Impact 4.3-4), the SJVAPCD changed its cancer risk action level to 20 per 1 million in a policy dated May 28, 2015 (APR-1906 "Framework for Performing Health Risk Assessments"). The action level for non-cancer risk is a hazard index of 1.0 at any point beyond the facility boundary where a person could reasonably experience exposure to such risk.

SJVAPCD Health-Risk Reduction Strategy

In 2010, the SJVAPCD Governing Board adopted the Risk-Based Strategy, which focuses on measures that address the pollutants for which the Valley is working toward attainment: ozone and fine PM. This strategy is also gaining widespread support by the EPA and the scientific community. In May 2013, the SJVAPCD renamed its Risk-Based Strategy as the HRRS.

Driven by a rapidly expanding body of scientific research, there is now a growing recognition within the scientific community that from an exposure perspective, the NAAQS metrics for progress are a necessary, but increasingly insufficient, measure of total public health risk associated with air pollutants. In particular, control strategies for sources of $PM_{2.5}$ and ozone do not necessarily account for qualitative differences in the nature of their emissions. For $PM_{2.5}$, toxicity has been shown to vary depending on particle size, chemical species, and surface area. In the case of ozone, differences in the relative potency of ozone precursors, VOCs in particular, is not captured by a strict, mass-based approach to precursor controls. Thus, while the NAAQS and SIP process is motivated by public health, the process set forward under the CAA does not guarantee that the public health benefits of control strategies will be maximized.

The HRRS applies to regulatory, incentive, and outreach strategies and recognizes that risk to the public is not always proportional to the mass rate of emissions based on factors including the following:

- Ultrafine particles versus coarse particles
- Toxicity/carcinogens
- Intake fraction/deposition fraction
- NO_X versus VOCs
- NO_X versus ammonia reductions
- Photochemical reactivity of VOCs

The HRRS does not establish a new acceptable risk level, delay attainment of mass-based air quality standards, or ask for a change in the form of the mass-based air quality standards. Instead, it describes how to determine the potential risk to public health from a particular project.

SJVAPCD Policy APR 1905

In Policy APR 1905, the SJVAPCD establishes three stages for risk evaluation for all projects resulting in increases in hourly, daily, or annual potential to emit HAPs from new and modified sources, except projects specifically exempted in approved SJVAPCD permitting policies. The stages are the following:

A. Prioritization

projects shall be prioritized using the California Air Pollution Control Officers Association Facility Prioritization Guidelines. A prioritization score is used for determining the applicability of toxic best available control technology to each new and modified emissions units and the need for a detailed HRA.

B. Health Risk Assessment

Projects with cumulative increases in prioritization score of greater than one require an HRA using the OEHHA Guidelines.

C. Calculation of Increase in Permitted Emissions

Increase is determined as the difference between the baseline and proposed Potential to Emit for the pollutant. APR 1905 specifies that the SJVAPCD policy defining certain small increases of criteria pollutant emissions as zero does not apply to HAPs.

Kern County General Plan

The project area is located within the Kern County General Plan (KCGP) area and, therefore, would be subject to applicable policies and measures of the KCGP. The Land Use, Conservation, and Open Space Element; Safety Element; and the Energy Element of the KCGP include goals, policies, and implementation measures related to air quality that apply to the project, as described below.

Chapter 1. Land Use, Conservation, and Open Space Element

1.10.2. Air Quality

Policies

Policy 19. In considering discretionary projects for which an environmental impact report must be prepared pursuant to the California Environmental Quality Act, the appropriate decision-making body, as part of its deliberations, will ensure that:

a) All feasible mitigation to reduce significant adverse air quality impacts have been adopted; and

b) The benefits of the proposed project outweigh any unavoidable significant adverse effects on air quality found to exist after inclusion of all feasible mitigation. This finding shall be made in a statement of overriding considerations and shall be supported by factual evidence to the extent that such a statement is required pursuant to the CEQA.

Policy 20. The County shall include fugitive dust control measures as a requirement for discretionary projects and as required by the adopted rules and regulations of the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District on ministerial permits.

Policy 21. The County shall support air districts' efforts to reduce PM_{10} and $PM_{2.5}$ emissions.

Policy 22. Kern County shall continue to work with the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District toward air quality attainment with federal, State, and local standards.

Policy 23. The County shall continue to implement the local government control measures in coordination with the Kern COG and the San Joaquin Valley Unified Air Pollution Control District.

Implementation Measures

Implementation Measure F. All discretionary permits shall be referred to the appropriate air district for review and comment.

Implementation Measure G. Discretionary development projects involving the use of tractor trailer rigs shall incorporate diesel exhaust reduction strategies including the following:

- Minimizing idling time
- Electrical overnight plug-ins

Implementation Measure H. Discretionary projects may use one or more of the following to reduce air quality effects:

- Pave dirt roads within the development
- Pave outside storage areas
- Use of alternative fuel fleet vehicles or hybrid vehicles
- Use of emission control devices on diesel equipment
- Other strategies that may be recommended by the local Air Pollution Control Districts

Chapter 4. Safety Element

4.2. General Policies and Implementation Measure, which Apply to more than One Safety Constraint

Policies

Policy 1. That the County's program of identification, mapping, and evaluating the geologic, fire, flood safety hazard areas, and significant concentrations of hydrogen sulfide in oilfield areas, presently under way by various County departments, be continued.

Chapter 5. Energy Element

5.3.1. Urban/Residential Development in Petroleum Resource Areas

Policies

Policy 8. Reduce the public's exposure to fires, explosions, blowouts, and other hazards associated with the accidental release of crude oil, natural gas, or hydrogen sulfide gas by ensuring that discretionary development projects have adequate separation from oil and natural gas production land uses.

Chapter V. Conservation Element

E. Air Quality

Goals

Goal 1. Promote air quality that is compatible with health, well-being, and enjoyment of life by controlling point sources and minimizing vehicular trips to reduce air pollutants.

Goal 2. Continue working toward attainment of Federal, State and Local standards as enforced by the San Joaquin Valley Unified Air Pollution Control District.

Goal 3. Reduce the amount of vehicular emissions in the Planning Area.

Policies

Policy 1. Comply with and promote San Joaquin Valley Unified Air Pollution Control District control measures regarding ROG. Such measures are focused on: (a) steam driven well vents, (b) Pseudo-cyclic wells, (c) natural gas processing plant fugitives, (d) heavy oil test signs, (e) light oil production fugitives, (f) refinery pumps and compressors, and (g) vehicle inspection and maintenance (I-1).

Policy 2. Encourage land uses and land use practices which do not contribute significantly to air quality degradation (I-1).

Policy 3. Require dust abatement measures during significant grading and construction operations (I-1).

Policy 5. Consider the location of sensitive receptors such as schools, hospitals, and housing developments when locating industrial uses to minimize the impact of industrial sources of air pollution (I-1).

4.3.4 Impacts and Mitigation Measures

Methodology

This section discusses the methodologies used to conduct the evaluation of air quality impacts for the project, including guidelines for preparing environmental documents under CEQA and technical methods employed in the evaluation. The air quality significance criteria were developed considering the CEQA significance criteria developed by the local air quality district in the project area, which is the SJVAPCD, approved CEQA air quality checklists, and considering other federal criteria.

The analysis presented within this section is based on qualitative and quantitative approaches for determining air quality impacts associated with construction, operation, and maintenance of the project. The baseline for purposes of this analysis is considered to be the physical environmental conditions existing as of the beginning of environmental analysis (2022). The change in the environment caused by the project results from construction and from operation of the amine carbon capture units.

Pollutant Emissions

The construction and operational emissions were estimated from several emissions models and associated spreadsheet calculations, depending on the source type and data availability. The sources used estimate emissions included CARB's on-road vehicle emission factor model (EMFAC)

version 2021, the California Emissions Estimator Model (CalEEMod) versions 2020.4.E0 and 2022.1.1.14, TanksESP, AP-42 emission factors, manufacturer guaranteed emission factors, and SJVAPCD PTO emission factors. Construction and operational emissions were estimated using project-specific data and schedules within the models.

Construction Emissions

Construction emissions of the proposed project were estimated in CalEEMod based on the construction schedule starting in 2025. CO_2 capture facility and infrastructure construction would occur over a period of approximately three years, starting with the pre-combustion facility construction at GP 32. Sequential construction would occur for construction of the post-combustion facilities located at COGEN 32 and the two steam generator setting (SGS) sites. Injection well pad construction, drilling and plugging and abandonment activities, and pipeline construction activities would begin concurrently with the start of facility construction. Installation of CO_2 distribution pipelines, intra-field electrical distribution, and well hookups would occur throughout the three-year period.

The CalEEMod equipment list was updated to reflect the list of proposed construction equipment and schedule that was provided by the project proponent. Applying model defaults as well as a conservative analysis approach, construction emissions were estimated as if construction started in January of 2025. The dates entered into the CalEEMod program may not represent the actual dates the equipment will operate; however, the total construction time is accurate, and therefore, all estimated emission totals are conservative and reflect a reasonable and legally sufficient estimate of potential impacts. All construction equipment activity assumption levels were based on the specified CalEEMod default values. Details of CalEEMod inputs and assumptions are included in the Air Quality Impact Analysis.

Mobile source emissions during construction were estimated using CARB's EMFAC model version EMFAC2021 based on anticipated daily trips from haul trucks during pipeline construction, vendor trips during well pad and well construction, and worker commutes during the entire construction period. Details of EMFAC2021 inputs and assumptions are included in the Air Quality Impact Analysis.

Operational Emissions

Mobile source emissions from worker commute vehicles during operations were estimated using EMFAC2021, as described in the Air Quality Impact Analysis. Existing steam generators will have increased fuel usage as a result of this project; however, these increases will be offset by decreases at other existing steam generators at Belridge. These increases were not included in operational emissions calculations because there is no change; however, these emissions are included in the HRA since the location of the emissions will have changed.

GAMAQI recommends that lead agencies consider situations wherein a new or modified source of HAPs is proposed for a location near an existing residential area or other sensitive receptor when evaluating potential impacts related to HAPs. The proposed project would result in new HAP emissions of DPM from construction equipment exhaust, construction and operational commute

vehicles, and operational fugitive VOC emissions from the new capture facilities. Therefore, an assessment of the potential risk to the population attributable to emissions of HAPs from the proposed project is required.

Health Risk Assessment

To predict the potential health risk to the population attributable to emissions of HAPs from the proposed project, ambient air concentrations were predicted with dispersion modeling to arrive at a conservative estimate of increased individual carcinogenic risk that might occur as a result of continuous exposure over a 3-year construction timeline and a 67-year lifetime for operational exposure. Health risk was determined using EPA's AERMOD dispersion model, CARB's Hotspots Analysis Reporting Program (HARP2), following guidance from the California EPA OEHHA, as detailed in the Air Quality Impact Analysis.

Thresholds of Significance

The CEQA Appendix G Checklist and the Kern County adopted CEQA thresholds state that a project would have a significant air quality impact if it would:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard. Specifically, implementation of the project would have a significant impact on air quality if it would exceed any of the thresholds adopted by the San Joaquin Valley Unified Air Pollution Control District, as summarized in Table 4.3-7.

Table 4.3-7: SJVAPCD Criteria Pollutant Emissions Significance Thresholds (tons per year)

Pollutant/ Precursor	Construction Emissions	Operational Emissions	
		Permitted Sources and Activities	Non-Permitted Sources and Activities
ROG	10	10	10
NO_X	10	10	10
PM_{10}	15	15	15
$PM_{2.5}$	15	15	15
CO	100	100	100
SO_X	27	27	27

Source: SJVAPCD 2015, Section 8.3.
Key: CO = carbon monoxide
NO_X = oxides of nitrogen
PM_{10} = particulate matter less than 10 microns
$PM_{2.5}$ = particulate matter less than 2.5 microns
ROG = reactive organic gases
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_XS = sulfur oxides

Project Impacts

Impact 4.3-1: Conflict with or Obstruct Implementation of the Applicable Air Quality Plan

The air pollution control districts and air quality management districts have the primary responsibility for controlling emissions from sources other than locomotives, motor vehicles and other specified statewide sources (such as consumer products), which are the responsibility of CARB or the EPA. Air districts adopt and enforce rules and regulations to ensure that emissions comply with national, state, and local emission standards, and will not interfere with the attainment and maintenance of the State and federal ambient air quality standards. The project is located within the administrative boundaries of the SJVAPCD, which has jurisdiction over air quality in the SJVAB.

Activities that would be authorized under the project would result in emissions from new stationary sources, electricity use, and on-road vehicular traffic from the operations and maintenance of the carbon capture and storage (CCS) facility. Air pollutants would also be emitted during project construction (off-road construction equipment, on-road vehicles, and fugitive PM from material movement).

Consistency with Applicable Air Quality Plans

The SJVAPCD has developed plans to attain State and federal standards for ozone and PM. The District's air quality plans include emissions inventories to identify the sources and quantities of air pollutant emissions, evaluate how well different control methods have worked, and demonstrate

how air pollution will be reduced. The plans also use computer modeling to estimate future levels of pollution to ensure that the Valley will meet air quality goals. As of June 2020, the following attainment/maintenance plans are in effect, as detailed in Section 4.3.3, *Regulatory Setting*, above.

Consistency with SJVAPCD Applicable Permits Required

SJVAPCD Rule 2010 (Permits Required) requires that an ATC Permit and a PTO be obtained prior to constructing, altering, replacing, or operating any device that emits or may emit air contaminants. SJVAPCD Rule 2410 (PSD) requires that preconstruction permits be obtained for new major stationary sources and major modifications to existing major stationary sources in areas classified as attainment or unclassifiable for any criteria pollutant. Since the project would not construct or modify an existing stationary source device, no ATC Permits, Permits to Operate, or PSD preconstruction permits would be required.

SJVAPCD Rule 2410 (PSD) requires that preconstruction permits be obtained for new major stationary sources and major modifications to existing major stationary sources in areas classified as attainment or unclassifiable for any criteria pollutant. A stationary source or a modification is considered major if the net emissions increase equals or exceeds 40 tons per year VOC, 40 tons per year NO_X, 15 tons per year PM_{10}, 10 tons per year $PM_{2.5}$, 100 tons per year CO, or 40 tons per year SO_2. Stationary source emissions increases associated with the project would not exceed these thresholds. Therefore, a PSD preconstruction permit would not be required for the project.

Consistency with SJVAPCD Applicable Rules

Activities that would be authorized under this project would result in emissions from construction and on-road vehicular traffic from the construction and operations of the CCS facilities facility. Following is a list of the SJVAPCD rules that could potentially apply to construction and operation activities that would be authorized under this project.

Activities that would be authorized under this project would be required to comply with the relevant provisions of the following rules:

- Rule 2020 (Exemptions)
- Rule 3135 (Dust Control Plan Fee)
- Rule 4101 (Visible Emissions)
- Rule 4102 (Nuisance)
- Rule 4201 (PM Concentration)
- Rule 4202 (PM Emission Rate)
- Rule 4651 (Soil Decontamination Operations)
- Rule 8011 (General Requirements)
- Rule 8021 (Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities)

- Rule 8031 (Bulk Materials)
- Rule 8041 (Carryout and Trackout)
- Rule 8051 (Open Areas)
- Rule 8061 (Paved and Unpaved Roads)
- Rule 8071 (Unpaved Vehicle/Equipment Traffic Areas)
- Rule 9510 (Indirect Source Review)

Consistency with Applicable Indirect Source Review

On December 15, 2005, the SJVAPCD Governing Board adopted Rule 9510 (Indirect Source Review, or ISR). The District's ISR rule is intended to reduce NO_X and PM_{10} emissions from new development projects. Rule 9510 requires developers of specified development projects to submit applications and reduce emissions through on-site mitigation, off-site SJVAPCD-administered projects, or a combination of the two.

Rule 9510 exempts nonresidential projects with contiguous or adjacent property under common ownership of a single entity in whole or in part, which is designated and zoned for the same development density land use and has the capability to accommodate development projects emitting more than 2.0 tons per year of operational NO_X or PM_{10}. The activities authorized under this project would not emit more than 2.0 tons of operational NO_X or PM_{10}. Therefore, the project is exempt from Rule 9510 under Section 4.4.3, more specifically under Section 4.4.3.9 (SJVAPCD 2005).

Permitted Source Emissions

Emission increases associated with activities authorized under this project would not be generated by stationary sources that would require SJVAPCD permits. Therefore, permitted source emissions would be consistent with the SJVAPCD's adopted regulatory program to attain State and federal ozone and PM standards.

Non-Permitted Source/Activity Emissions

Non-permitted sources and activities would be subject to the following federal and State regulatory programs that are incorporated within the attainment plans for State and federal ozone and PM standards:

- Heavy-duty engine and on-road vehicle standards enacted by CARB and the EPA (California Standards Codified at 13 CCR Section 1956.8).
- Light and medium on-road vehicle standards enacted by CARB (starting at 13 CCR Section 1900).

Non-permitted source/activity emissions were calculated using CARB's EMFAC2021 emissions model, which reflects adopted California on-road vehicle emission standards, and Version 2022.1.1.14 model to generate emissions from construction activities. Therefore, non-permitted

source/activities would be consistent with adopted regulatory programs incorporated within the SJVAPCD's ozone and PM attainment plans.

Consistency with Kern County General Plan

CCS activities that would be authorized under the project would be required to comply with the policies and measures of the KCGP as discussed in greater detail in Section 4.11, *Land Use and Planning*, of this EIR.

In the absence of Mitigation Measures (MMs) 4.3-1 through 4.3-4, activities that would be authorized under the project could potentially conflict with or obstruct implementation of the applicable air quality plan or potentially be inconsistent with the General Plan measures and, therefore, could be significant.

MMs 4.3-1 through 4.3-4 have been included to provide consistency with the adopted General plan and applicable plans by the San Joaquin Air Pollution Control District.

Mitigation Measures

MM 4.3-1 Consistent with the requirements of the SJVAPCD Regulation II-Permits, the owner/operator shall obtain an ATC permit and a PTO for any facility or equipment requiring a permit from the SJVAPCD, such as stationary sources required to obtain permits pursuant to District Rule 2010. All emissions increases from permitted equipment shall comply with District Rule 2201.

MM 4.3-2 The owner/operator shall develop and implement a Fugitive Dust Control Plan in compliance with SJVAPCD fugitive dust suppression regulations. The Fugitive Dust Control Plan shall include:

a. Name(s), address(es), and phone number(s) of person(s) responsible for the preparation, submission, and implementation of the plan.

Description and location of operation(s).

Listing of all fugitive dust emissions sources included in the operation.

The following dust control measures shall be implemented:

1. All on-site unpaved roads shall be effectively stabilized using water or chemical soil stabilizers that can be determined to be as efficient as or more efficient for fugitive dust control than CARB approved soil stabilizers, and that shall not increase any other environmental impacts including loss of vegetation.
2. All material excavated or graded will be watered to prevent excessive dust. Watering will occur as needed with complete coverage of disturbed areas. The excavated soil piles will be watered as needed to limit dust emissions to less than 20 percent opacity or covered with temporary coverings.

3. Construction activities that occur on unpaved surfaces will be discontinued during windy conditions when winds exceed 25 miles per hour and those activities cause visible dust plumes that exceed the SJVAPCD 20-percent opacity standard.
4. Track-out debris onto public paved roads shall not extend 50 feet or more from an active operation and track-out shall be removed or isolated such as behind a locked gate at the conclusion of each workday, except on agricultural fields where speeds are limited to 15 mph.
5. All hauling materials should be moist while being loaded into dump trucks.
6. All haul trucks hauling soil, sand, and other loose materials on public roads shall be covered (with tarps or other enclosures that would reduce fugitive dust emissions).
7. Soil loads should be kept below 6 inches or the freeboard of the truck.
8. Drop heights when loaders dump soil into trucks shall not exceed 5 feet above the truck.
9. Gate seals should be tight on dump trucks.
10. Traffic speeds on unpaved roads shall be limited to 25 miles per hour.
11. All grading activities shall be suspended when visible dust emissions exceed 20 percent.
12. Other fugitive dust control measures as necessary to comply with SJVAPCD Rules and Regulations.
13. Disturbed areas shall not exceed those shown on the Site Plan.
14. Disturbed areas should be re-vegetated as soon as possible after disturbance if area is no longer needed for oil and gas activities.

MM 4.3-3 All off-road construction diesel engines not registered under CARB's Statewide Portable Equipment Registration Program, which have a rating of 50 horsepower or more, shall meet, at a minimum, the Tier 3 California Emission Standards for Off-road Compression-Ignition Engines as specified in CCR, Title 13, section 2423(b)(1) unless that such engine is not available for a particular item of equipment. In the event a Tier 3 engine is not available for any off-road engine larger than 100 horsepower, that engine shall be equipped with retrofit controls that would provide nitrogen oxides and PM emissions that are equivalent to Tier 3 engine.

a. All equipment shall be turned off when not in use. Engine idling of all equipment shall be limited to five minutes, except under exemptions specified in CCR Title 13 Section 2449(d)(2)(A).
b. All equipment engines shall be maintained in good operating condition and in proper tune per manufacturers' specifications.

MM 4.3-4 To further reduce emissions of oxides of nitrogen from on-road heavy-duty diesel haul vehicles:

a. 2007 engines or pre-2007 engines shall comply with CARB retrofit requirements set forth in CCR Title 13 Section 2025.

b. All on-road construction vehicles, except those meeting the 2007/California Air Resources Board-certified Level 3 diesel emissions controls, shall meet all applicable California on-road emission standards and shall be licensed in the State of California. This does not apply to worker personal vehicles.

c. All on-road construction vehicles shall be properly tuned and maintained in accordance with the manufacturers' specifications.

Level of Significance After Mitigation

Impacts would be less than significant.

Impact 4.3-2: Result in a Cumulatively Considerable Net Increase of Any Criteria Pollutant for Which the Project Region is Nonattainment under an Applicable Federal or State Ambient Air Quality Standard

The current nonattainment status of regional pollutants is determined by past development and present activities. The District's attainment plans are designed to ensure the future attainment of State and federal ambient air quality standards. Consequently, the District's application of thresholds of significance for emission of criteria pollutants determines whether a project's emissions would have a cumulatively considerable contribution of emissions of a criteria pollutant for which the District is nonattainment. If project emissions exceed the thresholds of significance for criteria pollutants the project would be expected to result in a considerable net increase of any criteria pollutant for which the District is in nonattainment under applicable federal or State ambient air quality standards. The SJV is in nonattainment for $PM_{2.5}$, PM_{10}, and ozone. Ozone is addressed by examining its precursors which are NO_X, VOC, and CO.

Per the SJVAPCD's March 2015 GAMAQI:

> "By its very nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development. Future attainment of State and Federal ambient air quality standards is a function of successful implementation of the District's attainment plans. Consequently, the District's application of thresholds of significance for criteria pollutants is relevant to the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality.

> A lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program, including, but not limited to an air quality attainment or maintenance plan that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located [CCR §15064(h)(1)].
>
> Thus, if project-specific emissions would be less than the thresholds of significance for criteria pollutants, as a general matter the project would not be expected to result in a cumulatively considerable net increase of any criteria pollutant for which the District is in non-attainment under applicable federal or State ambient air quality standards." (SJVAPCD 2015, Section 7.14.)

The SJVAPCD March 2015 Draft GAMAQI also states,

> As discussed in Section 8.3.1 (Basis for Air Quality Thresholds of Significance), the District's thresholds of significance for criteria pollutants are based on District rule 2201 (New Source Review) offset requirements. Furthermore, New Source Review (NSR) is a major component of the District's attainment strategy. NSR provides mechanisms, including emission trade-offs, by which Authorities to Construct such sources may be granted, without interfering with the attainment or maintenance of Ambient Air Quality Standards. District implementation of NSR ensures that there is no net increase in emissions above specified thresholds from new and modified Stationary Sources for all nonattainment pollutants and their precursors. In fact, permitted emissions above offset thresholds equivalent to the District's thresholds of significance for criteria pollutants are mitigated to below the thresholds, and the District's attainment plans show that this level of emissions increase will not interfere with attainment or maintenance of ambient air quality standards.
>
> The District's attainment plans demonstrate that project-specific net emissions increase below NSR offset requirements will not prevent the District from achieving attainment. Consequently, emission impacts from sources permitted consistent with NSR requirements are not individually significant and are not cumulatively significant. (SJVAPCD 2015, Section 8.8.4.)

As stated above, to evaluate whether the activities that would be authorized under the project would result in a cumulatively considerable net increase of any criteria pollutant for which the district is nonattainment, pollutant emissions will be evaluated against the SJVAPCD Criteria Pollutant thresholds listed in Table 4.3-8. For this analysis, if these thresholds are exceeded then the project would be considered to have significant impacts.

Source data and emissions associated with the project were determined based on the Air Quality Impact Analysis (Appendix B-1). The analysis is supplemented with information from the Kern

County Oil and Gas Final Supplemental Recirculated EIR (2020.2021) Section 4.3, Air Quality, referred to as the "Oil and Gas EIR." Air quality impacts associated with the project are separated by construction and operational emissions. The emissions tables presented are derived from the data provided in Appendix B-1 of this EIR.

Table 4.3-8: SJVAPCD Criteria Pollutant Emissions Significance Thresholds (tons per year)

Pollutant/ Precursor	Construction Emissions	Operational Emissions	
		Permitted Sources and Activities	Non-Permitted Sources and Activities
ROG	10	10	10
NO_X	10	10	10
PM_{10}	15	15	15
$PM_{2.5}$	15	15	15
CO	100	100	100
SO_X	27	27	27

Source: SJVAPCD 2015, Section 8.3.
Key:
CO = carbon monoxide
NO_X = oxides of nitrogen
PM_{10} = particulate matter less than 10 microns
$PM_{2.5}$ = particulate matter less than 2.5 microns
ROG = reactive organic gases
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_XS = sulfur oxides

The air analysis uses a baseline level equivalent to the 2022 Annual Emissions Inventory for current operations of on-site emissions sources: COGEN32, SGS 2868 and SGS 2972. Average emissions from 2009-2016 Annual Emissions Inventories were used as the representative baseline for GP32. Emissions reported in 2009 through 2022 are less than the permitted allowable emissions. Although existing oil and gas activities have the potential to increase these emissions over time, the projected emissions for the years from 2015 to 2035 are shown in the Oil and Gas EIR Table 4.3-31. The beginning of construction is 2025, and the 2025 emissions from the Oil and Gas EIR Table 4.3-31 are summarized in Table 4.3-9.

Table 4.3-9: 2025 Estimated Incremental Emissions from Kern County Oil and Gas Non-Permitted Equipment and Activities - All New Wells in Tons per Year

Year	New Authorized Wells	NO_X	ROG	CO	SO_2	PM_{10}	$PM_{2.5}$
2025	3,647	4,936	2,668	8,456	12	631	201

Source: Kern SREIR

Table 4.3-9: 2025 Estimated Incremental Emissions from Kern County Oil and Gas Non-Permitted Equipment and Activities - All New Wells in Tons per Year

Year	New Authorized Wells	NO_X	ROG	CO	SO_2	PM_{10}	$PM_{2.5}$

Key:
CO = carbon monoxide
NO_X = oxides of nitrogen
PM_{10} = particulate matter less than 10 microns
$PM_{2.5}$ = particulate matter less than 2.5 microns
ROG = reactive organic gases
SO_2 = sulfur dioxide

All wells for the project, including the abandonment of over 200 oil and gas wells are included in this total as they are in project area for the Oil and Gas SREIR. In the County permitting years from 2016 to 2022, no more than 1,891 oil and gas conformity review permits and no more than 2,395 total permits (including conformity reviews, reworks and minor activity reviews) were issued in a single year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. California Geologic Energy Management Division (CalGEM) permitting for all wells with the exception of plugging and abandonments has never averaged over 2,000 permits a year (as implementation in some years of the County permits) since 2019. This analysis is, therefore, a very conservative impact review projected emissions.

Construction Emissions

To estimate emissions associated with construction activities associated with the proposed project, each activity was estimated separately for the following:

- Demolition
- Grading
- Well pads and roadways construction
- Well drilling
- Facilities construction
- Facility CO_2 aboveground pipeline intra-field pipeline construction
- Intra-field electricity distribution
- Transmission power line/substation construction
- Well re-abandonments

The data sources and assumptions used to estimate construction emissions are detailed in Appendix B-1.

The analysis of emissions generated in the construction of new facilities takes into account baseline and future activities. On-road and off-road emission factors associated with construction were estimated using two models: EMFAC2011 for on-road emission factors and OFFROAD2011 for off-road emission factors. Total emissions were calculated using the CalEEMod model.

Total emissions generated during the construction of the project and the SJVAPCD construction emissions thresholds are summarized in Table 4.3-10. This table includes emissions resulting from the construction of capture facilities, pipelines, electricity transmission, well pads, roads, and wells. The emission estimates include exhaust from anticipated construction equipment as well as emissions from haul truck, vendor, and commuter trips.

Table 4.3-10: Annual Construction Emissions (Tons/Year)

Emissions Source	Pollutant (tons/year)					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Year 2025 - Total	**6.75**	**50.41**	**45.99**	**0.09**	**4.14**	**3.03**
On-Site Roads	*0.09*	*0.30*	*0.22*	*0.00*	*0.01*	*0.01*
Facilities Pad Grading - GP32	*0.06*	*0.56*	*0.47*	*0.00*	*0.07*	*0.04*
Facilities Pad Grading - 32 Cogen	*0.06*	*0.56*	*0.47*	*0.00*	*0.07*	*0.04*
Facilities Pad Grading - SGS2868	*0.06*	*0.56*	*0.47*	*0.00*	*0.07*	*0.04*
Facilities Pad Grading – SGS2972	*0.06*	*0.56*	*0.47*	*0.00*	*0.07*	*0.04*
GP32 - CO_2 Capture Facility	*1.18*	*8.36*	*7.41*	*0.01*	*0.72*	*0.53*
32 Cogen - CO_2 Capture Facility	*1.97*	*13.91*	*12.34*	*0.02*	*1.20*	*0.88*
SGS2868 - CO_2 Capture Facility	*0.67*	*4.74*	*4.21*	*0.01*	*0.41*	*0.30*
Compressor Station Construction	*0.29*	*2.00*	*1.78*	*0.00*	*0.16*	*0.12*
CO2 Main Pipeline	*0.91*	*7.50*	*7.02*	*0.01*	*0.53*	*0.40*
Distribution Pipelines	*0.62*	*4.78*	*4.87*	*0.01*	*0.38*	*0.29*
Elec Transmission Lines	*0.11*	*1.05*	*0.74*	*0.00*	*0.05*	*0.04*
Onsite Electrical Substations	*0.17*	*1.53*	*1.54*	*0.00*	*0.11*	*0.08*
Water Pipelines	*0.16*	*1.29*	*1.28*	*0.00*	*0.10*	*0.07*
Tulare Casing Vapor Recovery Gas Pipeline	*0.11*	*0.89*	*0.88*	*0.00*	*0.07*	*0.05*
Steam Pipelines	*0.16*	*1.31*	*1.29*	*0.00*	*0.10*	*0.07*
Demolition	*0.06*	*0.52*	*0.54*	*0.00*	*0.03*	*0.02*
Year 2026 - Total	**10.37**	**93.21**	**72.07**	**0.18**	**6.07**	**4.47**
Facilities Pad Grading - SGS2972	*0.06*	*0.56*	*0.47*	*0.00*	*0.07*	*0.04*
GP32 - CO_2 Capture Facility	*2.30*	*16.24*	*14.41*	*0.03*	*1.41*	*1.03*
32 Cogen - CO_2 Capture Facility	*2.30*	*16.24*	*14.41*	*0.03*	*1.41*	*1.03*
SGS2868 - CO_2 Capture Facility	*2.30*	*16.24*	*14.41*	*0.03*	*1.41*	*1.03*
SGS2972 - CO_2 Capture Facility	*1.86*	*13.13*	*11.64*	*0.02*	*1.14*	*0.83*
CO_2 Main Pipeline	*0.44*	*3.51*	*3.43*	*0.01*	*0.25*	*0.19*

Table 4.3-10: Annual Construction Emissions (Tons/Year)

Emissions Source	Pollutant (tons/year)					
	ROG	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Intra-Field Electrical Distribution	*0.11*	*1.03*	*0.78*	*0.00*	*0.05*	*0.04*
Well Re-abandonments	*1.00*	*26.27*	*12.53*	*0.06*	*0.32*	*0.27*
Year 2027 - Total	**4.89**	**34.44**	**30.44**	**0.06**	**3.03**	**2.18**
GP32 - CO_2 Capture Facility	*0.95*	*6.73*	*5.95*	*0.01*	*0.59*	*0.43*
32 Cogen - CO_2 Capture Facility	*0.18*	*1.28*	*1.13*	*0.00*	*0.11*	*0.08*
SGS2868 - CO_2 Capture Facility	*1.46*	*10.27*	*9.08*	*0.02*	*0.90*	*0.65*
SGS2972 - CO_2 Capture Facility	*2.29*	*16.16*	*14.28*	*0.03*	*1.42*	*1.02*
Year 2028 - Total	**0.21**	**1.58**	**1.57**	**0.00**	**0.14**	**0.09**
SGS2972 - CO_2 Capture Facility	*0.21*	*1.58*	*1.57*	*0.00*	*0.14*	*0.09*
SJVAPCD Construction Emissions Threshold	10	10	100	27	15	15

Source: Trinity 2023
Key:
CO = carbon monoxide
NO_X = oxides of nitrogen
PM_{10} = particulate matter less than 10 microns
$PM_{2.5}$ = particulate matter less than 2.5 microns
ROG = reactive organic gases
SO_2 = sulfur dioxide

Total project emissions resulting from the construction of new facilities on an annual basis would exceed the SJVAPCD Criteria Pollutant Emissions Significance Thresholds for NO_X during 2025, 2026, and 2027, and for ROG during 2026.

Operational Emissions

Operational emissions sources include emissions from facilities that are stationary sources, emissions from permit-exempt sources, such as small pumps and emissions from mobile sources, such as vehicles. The analysis that follows is consistent with the recommendations of the SJVAPCD's March 2015 Guidance for Assessing and Mitigating Air Quality Impacts that operational criteria pollutant emissions associated with permitted sources and activities be evaluated separately from non-permitted sources and activities (SJVAPCD 2015, Section 8.3.3).

Permitted Stationary Equipment

The project will result in increased emissions from permitted stationary sources and fugitive sources. Table 4.3-11 summarizes the post-project permitted source emission increases from the existing facilities and new emissions from carbon capture facilities.

Table 4.3-11: Permitted Sources Emissions Increase

Emissions Source	Pollutant (tons/year)					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Cooling Tower – Pre-Combustion	-	-	-	-	0.39	0.39
New Cooling Tower – Cogen 32	-	-	-	-	3.22	3.22
New Cooling Tower – SGS 2972	-	-	-	-	2.80	2.80
New Cooling Tower – SGS 2868	-	-	-	-	2.52	2.52
Del Sur Compressors	0.25	0.12	1.04	0.08	0.01	0.01
New Steam Generators – Pre-C	3.13	3.47	10.69	5.69	4.33	4.33
Cogen 32	3.40	3.77	11.62	6.19	4.70	4.70
New Steam Generators – Cogen 32	5.35	5.93	18.26	9.72	7.39	7.39
New Steam Generators – SGS 2972	6.50	7.21	22.21	11.83	8.99	8.99
New Steam Generators – SGS 2868	5.85	6.49	19.99	10.64	8.09	8.09
Pre-Combustion Fugitive*	0.33	-	-	-	-	-
Cogen 32 Fugitive*	0.23	-	-	-	-	-
SGS 2972 Fugitive*	0.33	-	-	-	-	-
SGS 2868 Fugitive*	0.33	-	-	-	-	-
Permitted Source Increase	**38.6**	**41.3**	**127.83**	**67.60**	**60.25**	**60.25**

Source: Trinity 2023
Key:
CO = carbon monoxide
NO_X = oxides of nitrogen
PM_{10} = particulate matter less than 10 microns
$PM_{2.5}$ = particulate matter less than 2.5 microns
ROG = reactive organic gases
SO_2 = sulfur dioxide

Permit Exempt Equipment

In addition to the existing permitted sources, the project will have stationary source emissions from dilute amine storage tanks, fresh amine storage tanks, sulfuric acid tanks, cooling towers, steam generators, and fugitive emissions from components (collectively "capture facilities"). These capture facilities will have criteria emissions from fugitive component leaks and have been calculated according to the California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, as described in the Air Quality Impact Analysis (Appendix B-1). Tanks will have trace amounts of VOC and were not included in the criteria pollutant emissions summary, but they are included in the HRA. The emissions from the capture facilities are summarized in Table 4.3-12.

Table 4.3-12: Capture Facilities: Stationary Source Permit Exempt Equipment Emissions

Emissions Source	Pollutant (tons/year)					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Pre-Combustion Fugitive	0.33	-	-	-	-	-
Cogen 32 Fugitive	0.23	-	-	-	-	-
2868 Fugitive	0.33	-	-	-	-	-
Total	0.89	-	-	-	-	-

Source: Trinity 2023
Key:
CO = carbon monoxide
NO_X = oxides of nitrogen
PM_{10} = particulate matter less than 10 microns
$PM_{2.5}$ = particulate matter less than 2.5 microns
ROG = reactive organic gases
SO_2 = sulfur dioxide

The emissions from the capture facilities would not exceed the SJVAPCD thresholds for any pollutants. Therefore, permit exempt equipment emissions would have a less than significant impact.

Fugitive Dust

Operation of the project site at full buildout is not expected to present a substantial source of fugitive dust (PM_{10}) emissions. The main source of PM_{10} emissions would be from vehicular traffic associated with the project site.

PM10, on its own as well as in combination with other pollutants, creates a health hazard. The SJVAPCD's Regulation VIII establishes required controls to reduce and minimizing fugitive dust emissions. The following SJVAPCD Rules and Regulations apply to the proposed project (and all projects):

- Rule 4102 - Nuisance

- Regulation VIII – Fugitive PM_{10} Prohibitions
  - Rule 8011 - General Requirements
  - Rule 8021 - Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities
  - Rule 8041 - Carryout and Trackout
  - Rule 8051 - Open Areas

The project would comply with applicable SJVAPCD Rules and Regulations, the local zoning codes, and additional emissions reduction measures recommended under MM 4.3-2.

Mobile Sources

Mobile emissions sources include on-road sources of emission, such as gasoline-fueled light-duty autos and heavy-duty diesel trucks; off-road sources, such as trucks and tractors, and portable equipment, such as accumulators, generators, and pumps.

Project-related transportation activities from employees would generate mobile source ROG, NOx, SO_X, CO, PM_{10}, and $PM_{2.5}$ exhaust emissions. Exhaust emissions would vary substantially from day to day but would average out over the course of an operational year. The Traffic Study (Appendix I) analyzed the potential for operational vehicular traffic from the operations and maintenance of the CCS facilities. The traffic study estimated the project would require 10 additional workers at the project site each day. EMFAC2021 v1.0.2 was used to estimate mobile source emissions from 25 trips per day with a trip length of 50 miles. The emissions are shown in Table 4.3-13.

Table 4.3-13: Mobile Emissions

Emissions Source	Pollutant (tons/year)					
	ROG	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Mobile Emissions	0.008	0.040	0.515	0.002	0.008	0.003

Source: Trinity 2023
Key:
CO = carbon monoxide
NO_X = oxides of nitrogen
PM_{10} = particulate matter less than 10 microns
$PM_{2.5}$ = particulate matter less than 2.5 microns
ROG = reactive organic gases
SO_2 = sulfur dioxide

The total annual emissions of all criteria pollutants from mobile sources associated with the project do not require air permits and, therefore, would not be offset.

Total Well Emissions

Table 4-3-14 list the project's wells, well depths, and associated total emissions (NO_X, ROG, and PM_{10}), as detailed in the Air Quality Impact Analysis.

Table 4.3-14: Total Emissions on a Per Well Basis

Well Type	Depth (feet)	Emissions (Tons)
Injector	8,000-9,000	6.17
Injector	8,000-9,000	6.17
Injector	8,000-9,000	6.17
Injector	8,000-9,000	6.17
Injector	8,000-9,000	6.17
Injector	8,000-9,000	6.17
Injector	8,000-9,000	6.17
Injector	8,000-9,000	6.17
Injector	8,000-9,000	6.17
Monitoring	8,000-9,000	6.17
Monitoring	8,000-9,000	6.17
Monitoring	8,000-9,000	6.17
Monitoring	8,000-9,000	6.17
Monitoring	8,000-9,000	6.17
Monitoring	8,000-9,000	6.17
Monitoring	8,000-9,000	6.17
Monitoring	8,000-9,000	6.17
Total		**104.89**

Source: Trinity 2023
Key:
ft = feet

Total Project Emissions

Total project emissions were calculated using a conservative emissions scenario assuming all construction and operational activities could occur simultaneously. As summarized in Table 4.3-15, NO_X emissions would exceed the threshold; therefore, total operational emissions would result in a potentially significant impact. The construction of the wells shown on Table 4.3-15 includes all criteria pollutants from the drilling and construction of the wells which are primarily generating PM_{10} and $PM_{2.5}$. The total of all project emissions from all sources of construction and operation is 808.61 tons.

Table 4.3-15: Project Total Emissions

Emissions Source	Pollutant (tons/year)					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Fugitive Dust	-	-	-	-	-	-
Mobile Emissions	0.008	0.040	0.515	0.002	0.008	0.003
Permitted Source Increase	38.6	41.3	127.83	67.6	60.25	60.25
Pre-Combustion Fugitive	0.33	-	-	-	-	-
Cogen 32 Fugitive	0.23	-	-	-	-	-
SGS 2972 Fugitive	0.33	-	-	-	-	-
SGS 2868 Fugitive	0.33	-	-	-	-	-
Total Operational Emissions	39.83	41.34	128.35	67.60	60.26	60.25
2025 Construction Total	6.75	50.41	45.99	0.09	4.14	3.03
2025 – Well Drilling Activities	Inclusive [(a)]	Inclusive	Inclusive	Inclusive	14.14	11.20
2026 Construction	10.37	93.21	72.07	0.18	6.07	4.47
2026 – Well Drilling Activities	Inclusive	Inclusive	Inclusive	Inclusive	14.14	11.20
2027 Construction Total	4.89	34.44	30.44	0.06	3.03	2.18
2027 – Well Drilling Activities	Inclusive	Inclusive	Inclusive	Inclusive	14.14	11.20
2028 Construction Total	0.21	1.58	1.57	0.00	0.14	0.09
2028 – Well Drilling Activities	Inclusive	Inclusive	Inclusive	Inclusive	5.66	4.48
Total Project Emissions	62.05	220.98	278.42	67.93	116.06	103.62
SJVAPCD Operational Emissions Threshold	10	10	100	27	15	15
Is Threshold Exceeded?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Note:

(a) The well drilling emissions shown in the PM_{10} and $PM_{2.5}$ column are inclusive of all activities and criteria pollutant amounts generated by drilling and constructing the well including equipment, employee trips and factor for cumulative impacts of all active oil wells.

Source: Trinity 2023, Trinity 2024

Key:

CO = carbon monoxide

NO_X = oxides of nitrogen

PM_{10} = particulate matter less than 10 microns

$PM_{2.5}$ = particulate matter less than 2.5 microns

ROG = reactive organic gases

SJVAPCD = San Joaquin Valley Air Pollution Control District

SO_2 = sulfur dioxide

Because the project's total emissions would exceed the SJVAPCD thresholds for PM_{10} and $PM_{2.5}$, for which the project region is nonattainment under an applicable federal or State ambient air quality standard, this impact is considered significant before mitigation. Based on the nonattainment status of the air basin, regional health risks associated with air quality impacts and the requirement under CEQA that all reasonable and feasible mitigation be required, MM 4.3-5 requires the execution of a Developer Mitigation Agreement (DMA) with the SJVAPCD for mitigation of criteria pollutants.

The implementation of a DMA (MM 4.3-5) to reduce criteria pollutants of NO_X, ROGs, and PM net incremental emissions generated by a project has been incorporated into development projects in the county since 2008.

This is the same instrument and pathway the air district calls a VERA. Once applied as mitigation they are not a "voluntary" agreement with the SJVAPCD but is mandated by enforceable mitigation measures and is, therefore, called a DMA. The emission reductions required by a DMA are normally implemented within the SJVAB in quantities sufficient to fully mitigate the project's air quality impacts such that development of the project could be considered to result in no net increase in the designated criteria pollutant emissions over the criteria pollutant emissions that would otherwise exist without the development of the project, all to be verified by the SJVAPCD. The mandated emission reductions will be achieved by a menu of options that range from paying a calculated mitigation fee for use in doing emission reduction projects through a grant-type program to applicants in a pre-determined area. The executed DMA will require the payment of a calculated mitigation fee per ton to the SJVAPCD. The agreement also includes an additional administrative fee of 4 percent collected for the SJVAPCD. Expenditure of the mitigation funds is then done for certified air quality reduction projects through the SJVAPCD. Final determination of air quality reductions achieved shall be under the determination of the SJVAPCD. Projects that may be eligible for funding include but are not limited to the current amount per ton for 2024 established by the District for an ISR is $13,153 per ton plus the 4 percent administration fee. The current estimate for the mitigation fee amount is $1,625,973.86 plus the 4 percent administrative fee. Although normally the funding is used anywhere in the eight-county air basin for air emission reduction grants, SB 905 legislation for CCS projects has established a more specific area for mitigation.

Under the legislative requirements of Section 39741.1 of the California Health and Safety Code all funding shall be used in disadvantaged communities near the CCS project. MM 4.3-5 therefore details that unincorporated communities and incorporated cities within a 20-mile radius, measured from the corners of the CCS Surface Land Area are eligible for the use of the funding for qualified projects and shall be known as "Eligible CCS Air Funding Communities." No funding can be used outside those areas. Examples of feasible air emission reduction activities that may be funded by the DMA grants include the following:

- Replacing or retrofitting diesel-powered stationary equipment such as motors on generators, pumps and wells with electric or other lower-emission engines that are not subject to Title V reductions

- Replacing or retrofitting diesel-powered school, transit, municipal and other community mobile sources such as buses, car fleets, and maintenance equipment, with electric or other lower-emission engines
- Reducing emissions from public infrastructure sources such as water and wastewater treatment and conveyance facilities and reducing water-related emissions through water conservation and reclamation
- Funding lower-emission equipment and processes for local businesses, schools, non-profit and religious institutions, hospitals, city and county facilities, including electric vehicle charging facilities and electric vehicle transportation options for the selected communities

To support the implementation of the grant funding additional funding of $ 140,000 a year will be provided to the KCPNR Department for a dedicated staff resource to assist communities and cities is designing and applying for the grants in the Eligible CCS Air Funding Communities. This annual funding shall continue until all the mitigation funding is expended.

As implemented, the DMA results in greater reductions than would otherwise occur under the District's ISR, since the ISR does not require ROG reductions and the ISR only requires a percentage of reductions rather than full reductions of NO_X and PM resulting from project construction and operations. When adopting the ISR and the subsequent VERA/DMC programs, the District acknowledges that as ROG is a precursor to ozone, the reductions are not required in the VERA/DMA. Instead, the reductions are achieved by increasing the NO_X and PM tonnage for project levels; see SJVAPCD (2005); this and other key SJVAPCD documents are included as Appendix B-3. As the actual amount of ROG reductions achieved from NO_X and PM_{10} reductions is not absolutely certain, project emissions are still considered significant and unavoidable; however, all feasible and reasonable mitigation has been required to reduce criteria pollutants as close to "no net increase" as scientifically possible. This approach has been found legally sufficient by court rulings in the following cases: *California Building Industry Assn. v. SJV APCD*, Fresno County Case No. 06 CECG 02100 DS13; *National Association of Home Builders v. San Joaquin Valley Unified Air Pollution Control District*, Federal District Court, Eastern District of California, Case No. 1:07-CV-00820-LJO-DLB; and *Center for Biological Diversity et al. v. Kern County*, Fifth Appellate District, Case No. F061908.

Mitigation Measures

MM 4.3-5 Prior to issuance of any grading or construction permits the owner/operator shall enter into a DMA with the SJVAPCD. The DMA is to mitigation criteria emissions of the CCS project implementation, not required to be offset under a District rule as described in MM 4.3-1, and for project vehicle and other mobile source emissions. The owner/operator shall pay fees to fully offset project emissions of NOx (oxides of nitrogen), ROG, PM10 (particulate matter of 10 microns or less in diameter), and PM2.5 (particulate matter of 2.5 microns or less in diameter) (including as applicable mitigating for reactive organic gases by additive reductions of particulate matter of 10 microns or less in diameter) (collectively, "designated criteria emissions") to avoid any net increase in these pollutants. The air quality mitigation fee shall further be paid prior to the approval of any construction or

grading approval and shall be used to reduce designated criteria emissions to fully offset project emissions that are not otherwise required to be fully offset by District permit rules and regulations.

a. Examples of feasible air emission reduction activities that may be funded by air quality fees paid by the owner/operator or proposed and implemented by the owner/operator under the emission reduction agreement include the following:

    1. Replacing or retrofitting diesel-powered stationary equipment such as motors on generators, pumps and wells with electric or other lower-emission engines that are not subject to Title V reductions.

    2. Replacing or retrofitting diesel-powered school, transit, municipal and other community mobile sources such as buses, car fleets, and maintenance equipment, with electric or other lower-emission engines.

    3. Reducing emissions from public infrastructure sources such as water and wastewater treatment and conveyance facilities and reducing water-related emissions through water conservation and reclamation.

    4. Funding lower-emission equipment and processes for local businesses, schools, non-profit and religious institutions, hospitals, city and county facilities, including electric vehicle charging facilities and electric vehicle transportation options for the selected communities.

b. Under the legislative requirements of Section 39741.1 of the California Health and Safety Code all funding shall be used in disadvantaged communities near the CCS project. Unincorporated communities and incorporated cities within a 20-mile radius, measured from the corners of the CCS Surface Land Area are eligible for the use of the funding for qualified projects and shall be known as “Eligible CCS Air Funding Communities “. No funding shall be used outside those areas.

c. The owner/operator shall provide an annual payment of $140,000 to the KCPNR Department for the creation of a county managed community liaison position to provide technical support to the Eligible CCS Air Funding Communities and coordination with the SJVAPCD to expedite use of the funding for air mitigation projects. The first payment shall be made 30 days after approval of the DMA by the SJVAPCD. Annual payments shall be made by January 31 in the following years until confirmation by the District that all funding has been expended.

d. CARB shall review the Agreement for compliance with requirements of Section 39741.1 of the California Health and Safety Code before execution and adoption.

Level of Significance After Mitigation

Impacts would be significant and unavoidable**.**

Impact 4.3-3: Expose Sensitive Receptors to Substantial Pollutant Concentrations

Toxic Air Contaminants

The primary TAC of concern for this project would be DPM emitted within the project site from the construction of the proposed project. The proposed project would result in new emissions of HAPs of DPM from construction equipment exhaust and operational fugitive VOC emissions from the new amine units and would be located near existing residents and workers; therefore, an assessment of the potential risk to the population attributable to emissions of HAPs from the proposed project is required.

An HRA was completed for the project as part of the Air Quality Impact Assessment using the HARP2 software distributed by the CARB. The HRA evaluated the potential cancer risk and acute and chronic non-cancer risk from toxic emissions associated with construction and operation of the project. For construction health impacts, diesel combustion emissions from diesel on-site construction equipment, haul trucks, and vendor trips were modeled as an area source for on-site construction activity on the property. DPM was calculated using CalEEMod for on-site construction equipment. For operational health impacts, Fugitive leaks were modeled as volume sources.

Total cancer risk was predicted for 598 discrete off-site receptors. A hazard index was computed for chronic non-cancer health effects for each applicable endpoint and each receptor. A hazard index for acute non-cancer health effects was computed for each applicable endpoint and each receptor. SJVAPCD has set the level of significance for carcinogenic risk at twenty in one million (20×10^6), which is understood as the possibility of causing twenty additional cancer cases in a population of one million people. The level of significance for chronic and acute non-cancer risk is a hazard index of 1.0. All receptors were modeled as residential receptors with a 70-year exposure. This is conservative since all on-site receptors and business receptors would be exposed less than 70 years.

The carcinogenic risk and the health hazard index for chronic non-cancer risk at the points of maximum impact do not exceed the significance levels of twenty in one million (20 x 10-6, 2.0E-05) and 1.0, respectively for the proposed project. The maximum impact values are summarized in Table 4.3-16. Additional methodology details and electronic modeling files are provided in Appendix B-1.

Table 4.3-16: Potential Maximum Health Risk Summary

	Value	SJVAPCD Significance Threshold	Is Threshold Exceeded?

Excess Cancer Risk	6.68E-06	2.00E-05	No
Chronic Hazard Index	1.55E-02	1.0	No
Acute Hazard Index	4.74E-02	1.0	No

Source: Trinity 2024
Key:
SJVAPCD = San Joaquin Valley Air Pollution Control District

The HRA demonstrates that Cancer, Chronic, and Acute risk impacts related to project construction would not exceed established thresholds at nearby sensitive receptors. Additionally, non-carcinogenic and acute hazards at nearby sensitive receptors are calculated to be within acceptable limits for the project. As such, the health risk impact attributed to the construction and operation would not exceed risk thresholds, and impacts would be less than significant.

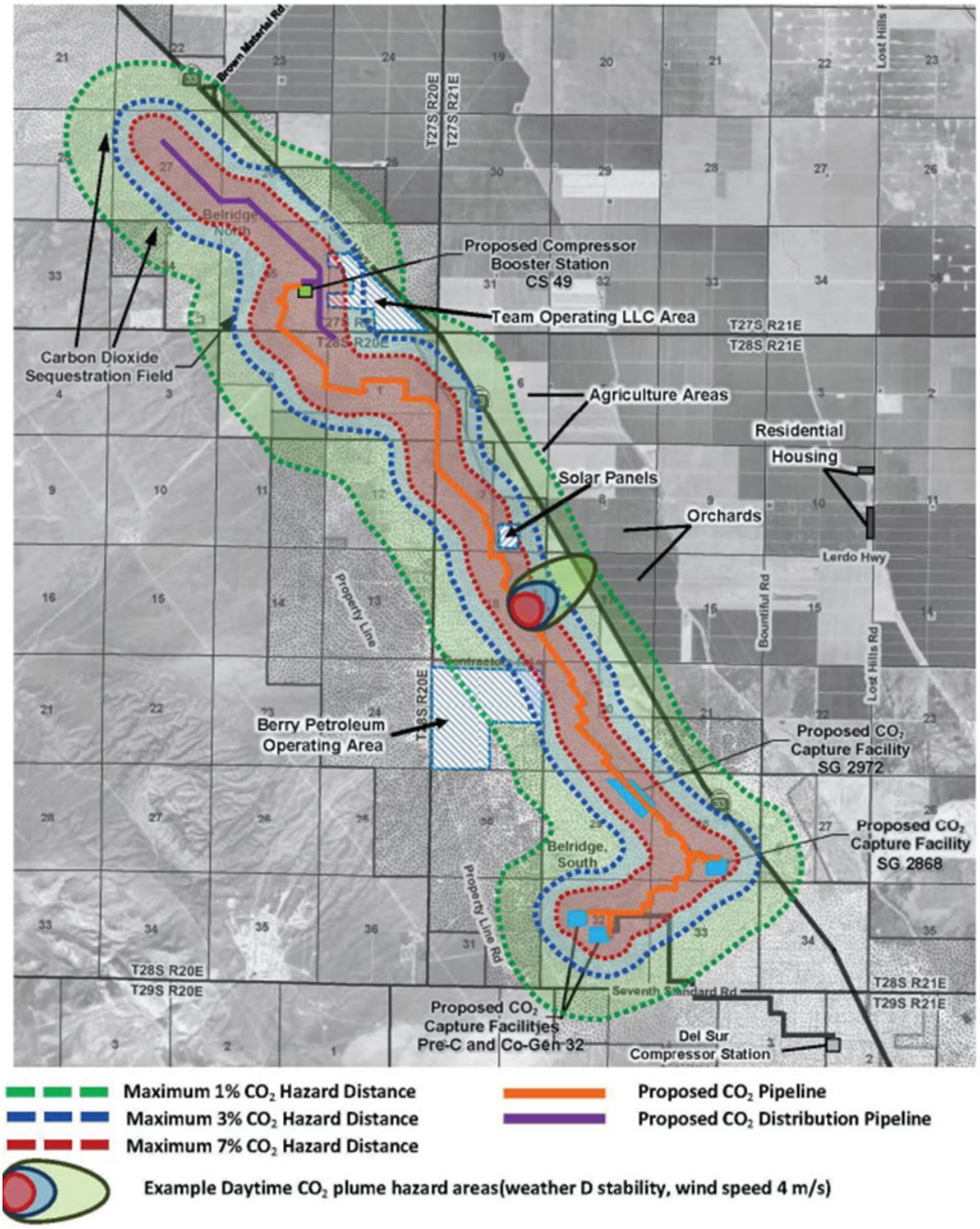
Carbon Dioxide

The project includes approximately 14.7 miles of CO_2 facility pipelines and injection lines. The injection pipeline and the facility pipelines would be newly designed and constructed aboveground to facilitate the transport of the CO_2 gas to the injection wells. When CO_2 in a super-critical phase (which is common for CO_2 pipelines) if released into open air, it naturally vaporizes into a heavier than air gas and dissipates. CO_2 vapor is 1.53 times heavier than air, and displaces oxygen, so it can act as an asphyxiant to humans and animals. The National Institute for Occupational Safety and Health has established that concentrations of 40,000 ppm are immediately dangerous to life and health. The Occupational Safety and Health Administration has established 5,000 ppm as a permissible exposure limit, which is an 8-hour time-weighted average (Mathews 2022) (Appendix B-3).

Appendix F-2, the Quantitative Risk Assessment includes detailed information on CO_2 dispersion modeling from the project facilities. The direction and momentum of a release may significantly affect the hazard distances. For release scenarios where this would make a significant difference, conservative assumptions were made to calculate the worst-case hazard distances. A large hole or line rupture of the CO_2 pipeline will result in the rapid release of the entire pipeline contents. It has been assumed that the loss of pressure will activate the automatic supervisory control and data acquisition (SCADA) shutdown system, limiting the release quantity to the pipeline contents. Hazard distances to CO_2 levels of concern for pipeline release scenarios are shown in Figure 4.3-1.

If CO_2 were to escape into the atmosphere via either well failure or pipeline rupture, the project could result in health impacts to humans and wildlife. Risk of pipeline rupture is discussed in Section 4.7, *Geology and Soils* and Section 4.9, *Hazards and Hazardous Materials*. With implementation of MM 4.3-6, MM 4.3-8, MM 4.3-9, MM 4.7-1, MM 4.9-9, and MM 4.9-10 potential impacts associated with pipelines rupture and/or well failure would be reduced; but would remain significant and unavoidable.

Figure 4.3-1: Map of CO_2 Pipeline Rupture – Potential Daytime Hazards Distances


Brown Material Rd
T27S R20E
T27S R21E
Belridge North
Proposed Compressor Booster Station CS 49
Team Operating LLC Area
T27S R21E
T28S R21E
Carbon Dioxide Sequestration Field
Agriculture Areas
Residential Housing
Solar Panels
Orchards
Lerdo Hwy
Bountiful Rd
Lost Hills Rd
Property Line
Contractor
T28S R20E
Berry Petroleum Operating Area
Proposed CO2 Capture Facility SG 2972
Proposed CO2 Capture Facility SG 2868
Belridge, South
Property Line Rd
T28S R20E
T29S R20E
Seventh Standard Rd
T28S R21E
T29S R21E
Proposed CO2 Capture Facilities Pre-C and Co-Gen 32
Del Sur Compressor Station
Maximum 1% CO2 Hazard Distance
Maximum 3% CO2 Hazard Distance
Maximum 7% CO2 Hazard Distance
Proposed CO2 Pipeline
Proposed CO2 Distribution Pipeline
Example Daytime CO2 plume hazard areas(weather D stability, wind speed 4 m/s)

Valley Fever

The *Coccidioides immitis* fungus spores in soil, which are responsible for transmitting the Valley Fever, can disperse in the air when the soil is disturbed during construction activities, and then can be inhaled into the lungs. On-site construction workers potentially could be exposed to Valley Fever from fugitive dust generated during construction of the proposed project, notably during excavation, grading, and other earthmoving activities. While there are no specific thresholds for the evaluation of potential Coccidioides immitis (Valley Fever) exposure, the potential for workers or area residents contracting Valley Fever as a result of the project is evaluated based on the anticipated earthmoving activities, and considers applicant-proposed measures and compliance with Rule 8021, Section 6.3, which requires development and implementation of a dust control plan to help control the release of the Coccidioides immitis fungus during construction activities. Construction activities within the project area are subject to SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibition). Regulation VIII is intended to reduce ambient concentrations of PM_{10} by requiring actions to prevent, reduce, or mitigate anthropogenic fugitive dust emissions. MM 4.3-7 would be implemented to further reduce impacts associated within Valley Fever and pandemics. By reducing fugitive dust emissions, Regulation VIII reduces potential exposure to Valley Fever. Since current long-term residents typically already have been exposed to and have developed immunity to Valley Fever, construction activities are not expected to add significantly to exposure of off-site residents to the fungus.

Mitigation Measures

The project shall be required to implement MM 4.7-1, MM 4.9-9 and MM 4.9-10 relative to risks of exposure to CO_2 from pipeline rupture or release. Furthermore, the project would be required to comply with the following mitigation measure for sensitive receptors.

MM 4.3-6 No Class VI or Class II injection well for use in this CCS project shall be located within 4000 feet of any sensitive receptor.

MM 4.3-7 The following measures shall be implemented to address Valley Fever and pandemics:

a. Project shall include in the Worker Environmental Awareness Program information on how to recognize the symptoms of Valley Fever and to promptly report suspected symptoms of work-related Valley Fever to a supervisor. A Valley Fever informational handout shall be provided to all on-site construction personnel. The handout shall, at a minimum, provide information regarding the symptoms, health effects, preventative measures, and treatment. Additional information and handouts can be obtained by contacting the Kern County Public Health Services Department. On-site personnel shall be trained on the proper use of personal protective equipment, including respiratory equipment. National Institute for Occupational Safety and Health (NIOSH)-approved respirators shall be provided to on-site personal, upon request as part of the Worker Environmental Awareness Training Program.
b. A onetime payment of $3,500 shall be made to the Kern County Public Health Services Department for the specific purposes of continued Valley Fever education and outreach.

c. Owner/operators shall implement all orders related to the COVID-19 pandemic or any other pandemic mandated by Kern County Public Health on well sites and related to worker safety.

MM 4.3-8 Prior to issuance of any construction or grading permits, the owner/operator shall consult with the SJVAPCD and develop a draft Air Monitoring program for fence line monitoring of all air constituents generated by the CCS project including criteria pollutants, CO_2, and H_2S. The plan shall be reviewed and approved by both the SJV Air District and the CARB, with a draft copy to the EPA UIC Program and the KCPNR Department and implemented before any construction on the CCS facilities can occur. The final approved plan shall be provided to the EPA UIC Program and the KCPNR Department.

MM 4.3-9 Prior to issuance of any grading or construction permits, the owner/operator shall comply with all requirements of the State of California requirements under Section 39741.1 of the California Health and Safety Code. Mitigation Measures that are more restrictive than the final adopted State Framework shall be implemented and cannot be waived by the State Carbon Framework determinations and must be implemented.

Level of Significance After Mitigation

Impacts would be significant and unavoidable.

Impact 4.3-4: Result in Other Emissions Such as Those Leading to Odors Adversely Affecting a Substantial Number of People

The SJVAPCD's GAMAQI states "An analysis of potential odor impacts should be conducted for both of the following two situations:

1. Generators – projects that would potentially generate odorous emissions proposed to locate near existing sensitive receptors or other land uses where people may congregate, and
2. Receivers – residential or other sensitive receptor projects or other projects built for the intent of attracting people locating near existing odor sources."

The GAMAQI also states that the District has identified some common types of facilities that have been known to produce odors in the SJVAB. Land uses typically producing objectionable odors include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The District has also identified a reasonable distance from the source within which, the degree of odors could possibly be significant.

The proposed project does not include any uses that would be associated with objectionable odors. Odors would come predominantly from construction equipment, which would cease immediately after construction is complete. Furthermore, the project would be required to comply with CCR, Title 13, Sections 2449(d)(3) and 2485, which minimizes the idling time of construction equipment either by shutting it off when not in use or by reducing the time of idling to no more than five minutes. This would further reduce the detectable odors from heavy-duty equipment exhaust.

Construction- related odors would be short-term and cease upon project completion. The closest property to the proposed project site is a small housing tract on Lost Hills Road, north of Lerdo Highway, roughly 3 miles east of the proposed project site. The community of Lost Hills is located 7 miles northeast of the proposed project site. Lost Hills Wonderful Park, a local park, is located approximately 7 miles northeast of the nearest injection well. Schools near the project site are listed in Table 4.3-17.

Table 4.3-17: Schools in the Vicinity of the Project Site

School Name	Student Population (2022-2023)	District	Distance to Conditional Use Permit Boundary (miles)	Distance to Closest Injection Well (miles)	Distance to Closest Facility Pipeline (miles)
Lost Hills Elementary School	180	Lost Hills Union Elementary	6.43	7.09	7.02
A.M. Thomas Middle School	82	Lost Hills Union Elementary	6.49	7.15	7.08
Wonderful College Prep Academy - Lost Hills	504	Kern County Office of Education	7.12	7.68	7.54
Lost Hills Elementary School	180	Lost Hills Union Elementary	6.43	7.09	7.02
A.M. Thomas Middle School	82	Lost Hills Union Elementary	6.49	7.15	7.08

Therefore, short-term fueling odors during construction would not impact a substantial number of people. As such, the proposed project is not expected to result in adverse emissions affecting a substantial number of people.

Based on the provisions of the SJVAPCD's GAMAQI, the proposed project would not exceed any screening trigger levels to be considered a source of objectionable odors or odorous compounds (SJVAPCD 2015). Furthermore, there does not appear to be any significant source of objectionable odors in close proximity that may adversely impact the project site when it is in operation. Additionally, the project emissions estimates indicate that it would not be expected to adversely impact surrounding receptors. As such, the proposed project would not be a source of any odorous compounds. Impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

4.3.5 Cumulative Setting, Impacts, and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present and reasonably foreseeable future oil and gas development including wells and abandonment activity to implement CCS projects constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance. *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018, an SREIR certified on March 8, 2021, and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells per year countywide of various types (production, water disposal, water flood injectors, idle wells, non-cyclic wells, observation wells, steam flood injectors, air injection, and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 of other wells (cyclic wells, SB 4 activities, plugged and abandoned) per year (pages 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for 8 years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. CalGEM permitting for all wells with the exception of plugging and abandonments has never averaged over 2,000 permits a year (as implementation in some years of the Kern County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The regional plans and projections evaluated in this cumulative analysis are described in Section 3.9, *Cumulative Projects*, of this EIR. Implementation of these plans and any projects associated with these plans would be required to comply with the goals, policies, and implementation measures of applicable federal and local laws and land use standards imposed by the respective jurisdictions within with each related project is located. All projects noted as being located in unincorporated Kern County will require analysis under CEQA and appropriate air mitigation. Projects in other jurisdictions will be subject to the lead agency determination of the appropriate pathway and CEQA analysis.

Impact 4.3-5: Result in Other Cumulatively Considerable Air Quality Impacts

As discussed above in Impact 4.3-2, by its very nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development. Future attainment of State and Federal ambient air quality standards is a function of successful implementation of the District's attainment plans. Consequently, the District's application of thresholds of significance for criteria pollutants is relevant to the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality. and the potential for the project's emissions to cause a cumulatively considerable net increase of criteria pollutants for which the SJVAPCD is nonattainment is discussed in Impact 4.3-2. However, the Kern County Air Quality Assessment Guidelines further require the cumulative air quality impact assessment to include consideration of the following issues:

- Consistency with Existing Air Quality Plans. Discuss the project in relation to Kern COG conformity and traffic analysis zones. Quantify emissions from similar projects and evaluate consistency with the applicable attainment plan.
- Localized Impacts. Assess the cumulative emissions impact associated with the proposed project, in conjunction with approved and proposed projects located within a 1- and 6-mile radius of the proposed project.
- Air Basin Emissions Analysis. Compare emissions from the proposed project to emissions within the SJVAB and the Kern County portion of the SJVAB.

Consistency with Existing Air Quality Plans

The project's consistency with the existing air quality plan is discussed under Impact 4.3-1 and it was determined the project could potentially conflict with or obstruct implementation of the applicable air quality plan or potentially be inconsistent with the General Plan measures and, therefore, could be significant.

Localized Impacts

Efforts to reduce emissions in the Kern region that have been conducted since the early 1990s at the national, state, regional, and local entities since the early 1990s are presented in Table 4.3-18. The agencies involved are the EPA, U.S. Department of Energy, Federal Highway Administration, Federal Transit Administration, CARB, California Department of Transportation, California Energy Commission, SJVAPCD, Eastern Kern APCD, and Kern COG and its local member agencies.

Table 4.3-18: Programs Designed to Reduce Air Pollutant Emissions

Level	Program
National	Corporate Average Fuel Economy Standards Fuel Pricing Locomotive Idling Reduction Locomotive Replacement or Repowering

Table 4.3-18: Programs Designed to Reduce Air Pollutant Emissions

Level	Program
	Transportation Construction Equipment Reductions
State	AB 118 – Air Quality Improvement Program AB 2766 – Motor Vehicle Fee Program CalStart Cap-and-Trade Program Clean Diesel Clean Vehicle Rebate Project High-Occupancy Vehicle Facilities Incident management/Kern 511 Traveler Information Inspection and Maintenance Programs Moyer Program Park-and-Ride Facilities Shifting/Separation Freight Movements Signal Synchronization and Roadway Intersection Improvements
Regional	CalVans Vanpool Program Commute Kern TDM Programs/Incentives Diesel Engine Retrofits Incentive Program Drive Clean Rebate Program IdleAIR Idling Reduction Facilities Project Clean Air (PCA) REMOVE II Programs Retirement/Replacement of Heavy-Duty Trucks Incentives Program Rule 8061 (SJVAPCD) Unpaved Road Dust Mitigation Rule 9310 (SJVAPCD) School Bus Fleets: Retirement/Replacement of Buses Rule 9410 (SJVAPCD) Employer-Based Trips Reduction (eTRIP) Rule 9510 (SJVAPCD) Indirect Source Review: Infill Incentive Zone Transportation Impact Fee Land Use Strategies. Valley Clean Air Now (CAN)
Local	Bicycle/Pedestrian Projects and Programs GET Online Trip Planner Transit Marketing, Information, and Amenities New/Expanded/Increased Transit Services Road Paving and Street Sweeping

Key:
SJVAPCD = San Joaquin Valley Air Pollution Control District
TDM = Transportation Demand Management

As explained in Impact 4.3-2 above, the construction activities associated with the project would result in a net increase of NO_X in excess of the recommended criteria pollutant significance threshold adopted by the SJVAPCD Board.

Emissions associated with the implementation of the project would not be counterbalanced by the above efforts to reduce emissions undertaken at the State and local levels, as well as the air quality improvement goals stated in the 2022 RTP. Therefore, the contribution of project-related impacts on air quality would be potentially significant.

Air Basin Emissions Analysis

To evaluate the contribution of the project's total emissions relative to the cumulative air quality conditions in Kern County and the SJVAB, the project's specific emissions are compared to the 2020 emissions inventory and the 2025 projected emissions of Kern County and the. Table 4.3-18 provides the emissions comparison of the project with Kern County and SJVAB in 2020, and Table 4.3-19 provides the emissions comparison of the project with Kern County and SJVAB in 2025.

As shown in Table 4.3-19 and Table 4.3-20, the project would contribute up to 13.28 percent of these pollutants in the county in 2020, and the project would contribute up to 14.29 percent of these pollutants in the county in 2025. It is speculative to determine how exceeding the regional thresholds would affect the number of days the region is in nonattainment since mass emissions are not correlated with concentrations of emissions or how many additional individuals in the air basin would be affected by the health impacts mentioned. The SJVAPCD is the primary agency responsible for ensuring the health and welfare of sensitive individuals to elevated concentrations of air quality in the SJVAB at the present time and it has not provided methodology to assess the specific correlation between mass emission generated and the effect on public health and welfare. Therefore, cumulative impacts for criteria pollutants are considered significant and unavoidable.

Mitigation Measures

Implement MM 4.3-1 through MM 4.3-9, as described above.

Level of Significance After Mitigation

Impacts would be significant and unavoidable.

Feasible and Reasonable Mitigation Analysis

A discussion of suggested mitigation for air impacts that was identified, considered, and rejected is provided in Section 4.3, *Air Quality*, of the Oil and Gas FEIR (2015) (SREIR Volume 3).

Table 4.3-19: Comparative Analysis Based on SJVAB 2020 Inventory

Emissions Source	Emissions (Tons/Year)					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Project Emissions						
Year 1 Construction Total	6.75	50.41	45.99	0.09	4.14	3.03
Year 2 Construction Total	10.37	93.21	72.07	0.18	6.07	4.47
Year 3 Construction Total	4.89	34.44	30.44	0.06	3.03	2.18
Year 4 Construction Total	0.21	1.58	1.57	0	0.14	0.09
Project Operation	39.83	41.34	128.35	67.60	60.26	60.25
Total Project Emissions	62.05	220.98	278.42	67.93	73.64	70.02
Kern County and SJVAB Emissions						
Kern County – 2020	21,535	15,878	27,337	511	13,651	3,723
SJVAB - 2020	108,113	74,205	162,425	2,847	69,652	21,535
Analytical Results						
Proposed Project Percent of Kern County	0.29%	1.39%	1.02%	13.29%	0.54%	1.88%
Proposed Project Percent of SJVAB	0.06%	0.30%	0.17%	2.39%	0.11%	0.33%

Key:
CO = carbon monoxide
NO_X = oxides of nitrogen
PM_{10} = particulate matter less than 10 microns
$PM_{2.5}$ = particulate matter less than 2.5 microns
SJVAB San Joaquin Valley Air Basin
SO_2 = sulfur dioxide

Table 4.3-20: Comparative Analysis Based on SJVAB 2025 Projection

Emissions Source	Emissions (Tons/Year)				
	ROG	NO_X	CO	SO_2	
Project Emissions					
Year 1 Construction Total	6.75	50.41	45.99	0.09	
Year 2 Construction Total	10.37	93.21	72.07	0.18	
Year 3 Construction Total	4.89	34.44	30.44	0.06	
Year 4 Construction Total	0.21	1.58	1.57	0	
Project Operation	39.83	41.34	128.35	67.60	
Total Project Emissions	62.05	220.98	278.42	67.93	
Kern County and SJVAB Emissions					
Kern County – 2025	21,353	10,804	26,674	475	
San Joaquin Valley – Air Basin - 2025	107,347	52,451	145,964	2,920	
Analytical Results					
Proposed Project Percent of Kern County	0.29%	2.05%	1.04%	14.30%	
Proposed Project Percent of SJVAB	0.06%	0.42%	0.19%	2.33%	

Key:
CO = carbon monoxide
NO_X = oxides of nitrogen
PM_{10} = particulate matter less than 10 microns
$PM_{2.5}$ = particulate matter less than 2.5 microns
SJVAB San Joaquin Valley Air Basin
SO_2 = sulfur dioxide

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Section 4.4

Biological Resources

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Section 4.4

Biological Resources

4.4.1 Introduction

This section of the Environmental Impact Report (EIR) describes the affected environment and regulatory setting for biological resources. It also describes the impacts on biological resources that would result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers [km]) southwest of the community of Lost Hills and west of State Route (SR) 33.

The information and analysis that is presented in this section has been derived from published literature, federal and State databases, and technical documents by Stantec Consulting Services Inc. for the project—specifically, the Biological Resources Technical Report (Appendix C-1) and Aquatic Resources Delineation Report (Appendix C-2). The purpose of the biological technical report was to evaluate the potential for sensitive biological resources within the project area. The sources of information used in this analysis are listed in Chapter 10, *Bibliography*.

A description of the environmental setting (affected environment) for biological resources is presented in Section 4.4.2, *Environmental Setting*, including a discussion of the biological resources. The regulatory setting applicable to biological resources is presented in Section 4.4.3, *Regulatory Setting,* and Section 4.4.4, *Impacts and Mitigation Measures*, discusses project impacts and associated mitigation measures.

4.4.2 Environmental Setting

Regional Setting

Kern County is California's third largest county, encompassing 8,202 square miles at the southern end of the Central Valley. The proposed project resides in the western portion of the County in the San Joaquin Valley, which is bounded by Kings and Tulare Counties to the north; Santa Barbara and San Luis Obispo Counties to the west; the Tehachapi Mountains and the Sierra Nevada to the east; and the northern boundary of the Los Padres National Forest to the south.

Topography

The project is situated in the eastern section of Kern County near the floor of the San Joaquin Valley. The southern Sierra Nevada foothills are east of the project, and the Temblor Range of the Southern Coast Range lies to the west. The topography of the project area is relatively flat, interrupted only by oil and gas infrastructure, and slopes gradually from west to east towards the San Joaquin Valley. The Study Area ranges from 675 feet above mean sea level (amsl) on the western edge down to 550 feet amsl on the eastern edge.

Climate

The region in which the project is located is characterized by a typical Mediterranean climate of hot summers and mild, wet winters. Average high temperatures range from 57 degrees Fahrenheit (°F) in January to 100°F in July, with daily temperatures exceeding 100°F several days in the summer. Average low temperatures range from 41°F in December to 67°F in July. Precipitation occurs primarily as rain, most of which falls from December to April, with an average of 5.4 inches of rainfall per year. Precipitation may also occur as a dense fog known as "Tule fog" during the winter months. Rain rarely falls during the summer months.

Vegetation

Vegetation in the Mojave Desert region where the project is located is influenced by arid climatic conditions, topography, desert soils, and past land uses. Vegetation in the region includes a predominance of plant morphological adaptations to extreme aridity (for example, waxy or resinous leaf cuticles, drought deciduous or succulent plants, woolly leaf pubescence, and deep tap root systems) and saline-alkali soils (for example, salt excretion and active transport systems). Vegetation structure is characterized by short-statured and widely spaced shrubs, and arborescent shrubs resulting from a competition for soil water resources.

Wildlife

Wildlife within the project area is typical of developed oilfields of western Kern County. Invertebrate species included beetles (*Coleoptera* spp.), flies (*Diptera* spp.), grasshoppers (*Orthoptera* spp.), moths and butterflies (*Lepidoptera* spp.), wasps, bees, ants (*Hymenoptera* spp.), and dragonflies and damselflies (*Odonata* spp.). Reptile species included the common side blotched lizard (*Uta stansburiana*), the western whiptail (*Aspidoscelis tigris*), and the northern pacific rattlesnake (*Crotalus oreganus*). Bird species included the common raven (*Corvus corax*), California quail (*Callipepla californica),* Loggerhead shrike (*Lanius ludovicianus*), Swainson's hawk (*Buteo swainsoni*), California horned lark (*Eremophila alpestris actia*), prairie falcon (*Falco mexicanus*), and yellow warbler (*Setophaga petechia*). Mammal species included San Joaquin antelope squirrel (*Ammospermophilus nelsoni*), kangaroo rat (*Dipodomys* sp.), desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), and Botta's pocket gopher (*Thomomys bottae).* A complete list of wildlife observed is included in Table 4.4-1.

Table 4.4-1: Wildlife Species Observed within the BSA		
Scientific Name	**Common Name**	**Notes**
Birds		
Artemisiospiza belli	Bell's sparrow	
Bubo virginianus	great horned owl	
Buteo jamaicensis	red-tailed hawk	
Buteo swainsoni	Swainson's hawk	State Threatened Species; incidental observation reported in third party 2023 BNLL Survey
Callipepla californica	California quail	
Cathartes aura	turkey vulture	
Charadrius vociferus	killdeer	
Chordeiles acutipennis	lesser nighthawk	
Columba livia	rock dove	
Corvus brachyrhychos	American crow	
Corvus corax	common raven	
Eremophila alpestris actia	horned lark	CDFW Watch List Species
Euphagus cyanocephalus	Brewer's blackbird	
Falco mexicanus	prairie falcon	CDFW Watch List Species
Geococcyx californianus	greater roadrunner	
Haemorhous mexicanus	house finch	
Icterus cucullatus	hooded oriole	
Lanius ludovicianus	loggerhead shrike	California Species of Special Concern
Mimus polyglottos	northern mockingbird	
Passer domesticus	house sparrow	
Passerculus sandwichensis	savannah sparrow	
Sayornis nigricans	black phoebe	
Sayornis saya	say's phoebe	
Setophaga petechia	yellow warbler	California Species of Special Concern
Sturnella neglecta	western meadowlark	
Sturnus vulgaris	European starling	
Thryomanes bewickii	Bewick's wren	
Tyrannus verticalis	western kingbird	
Tyto alba	barn owl	
Zenaida macroura	mourning dove	
Zonotrichia leucophrys	white-crowned sparrow	
Mammals		
Ammospermophilus nelsoni	San Joaquin antelope squirrel	State Threatened Species
Canis latrans	coyote	
Dipodomys sp.	kangaroo rat	

Table 4.4-1: Wildlife Species Observed within the BSA		
Scientific Name	**Common Name**	**Notes**
Lepus californicus	black-tailed jackrabbit	
Sylvilagus audubonii	desert cottontail	
Reptiles		
Aspidoscelis tigris	western whiptail	
Crotalus oreganus	Northern Pacific rattlesnake	
Gambelia sila	blunt-nosed leopard lizard	Federal Endangered, State Endangered, CDFW Fully Protected
Masticophis flagellum ruddocki	San Joaquin coachwhip	California Species of Special Concern
Pituophis catenifer	gopher snake	
Uta stansburiana	common side-blotched lizard	
Key: CDFW = California Department of Fish and Wildlife BNLL = Blunt-nosed leopard lizard		

Sensitive Natural Communities

Local, State, and federal agencies regulate special-status species and other sensitive biological resources and require an assessment of their presence or potential for presence to be on site prior to the approval of proposed development on a property. These species are considered threatened enough to warrant some level of protection. Appendix C-1 discusses sensitive biological resources observed within the biological study area (BSA) and evaluates the potential for the BSA to support other sensitive biological resources. Assessments for the potential occurrence of special-status species are based upon known ranges, species habitat preferences, species occurrence records from the California Natural Diversity Database (CNDDB), California Native Plant Society (CNPS), Information for Planning and Consultation, eBird, VertNet, and species occurrence records from other studies in the survey area, and the results of the surveys of the BSA.

Surface Hydrology and Jurisdictional Waters

Elevation ranges throughout the project area. There are no surface water bodies (creeks, streams, or rivers) within the project area (RWQCB 2018). As explained in Appendix C-2, aquatic features observed in the project area include two excavated drainage ditches, remnant sections of two ephemeral streams, and segments of Chico Martinez Creek (Appendix C-2). However, no surface water, high water table, saturation, or any other primary or secondary wetland hydrology indicators were observed during aquatic assessment and delineation. Surface water flow is unlikely to exist within these local drainages unless during heavy precipitation events. As part of the requirements of the Clean Water Act (CWA), beneficial uses for surface and ground waters must be identified in the Central Valley Regional Water Quality Control Board's (RWQCB) Tulare Lake Basin Water Quality Control Plan (Basin Plan). Because the project area contains no surface water bodies, there are no surface water beneficial uses associated with the project area (RWQCB 2018).

Wildlife Corridors and Special Linkages

Wildlife corridors and linkages facilitate regional animal movement and are generally centered in or around waterways, riparian corridors, flood control channels, contiguous habitats, and upland habitats. Drainages generally serve as movement corridors because wildlife can move easily through these areas, and fresh water is available. Corridors also offer wildlife unobstructed terrain for foraging and for dispersal of young individuals.

As the movements of wildlife species are more intensively studied using radio-tracking devices, there is mounting evidence that some wildlife species do not necessarily restrict their movements to some obvious landscape element, such as a riparian corridor. For example, radio-tracking and tagging studies of Coast Range newts, California red-legged frogs, southwestern pond turtles, and two-striped garter snakes determined that long-distance dispersal involved radial or perpendicular movements away from a water source with little regard to the orientation of the assumed riparian "movement corridor." Likewise, carnivores do not necessarily use riparian corridors as movement corridors, frequently moving overland in a straight line between two points when traversing large distances. In general, the following corridor functions can be used when evaluating impacts on wildlife movement corridors:

- Movement corridors are physical connections that allow wildlife to move between patches of suitable habitat. Corridor trait requirements (for example, length, width, and adjacent land use) for a corridor to be useful are unknown. However, the critical features of a movement corridor may not be its physical traits, but rather how well a particular piece of land fulfills several functions including allowing dispersal, plant propagation, genetic interchange, and recolonization following local extirpation (Appendix C-1).
- Dispersal corridors are relatively narrow, linear landscape features embedded in a dissimilar matrix that links two or more areas of suitable habitat that would otherwise be fragmented and isolated from one another by rugged terrain, changes in vegetation, or human-altered environments. Corridors of habitat are essential to the local and regional population dynamics of a species because they provide physical links for genetic exchange and allow animals to access alternative territories as dictated by fluctuating population densities.
- Habitat linkages are broader connections between two or more habitat areas. This term is commonly used as a synonym for a wildlife corridor. Habitat linkages may serve as source areas for food, water, and cover, particularly for small- and medium-size animals.
- Travel routes are usually landscape features, such as ridgelines, drainages, canyons, or riparian corridors, within larger natural habitat areas that are used frequently by animals to facilitate movement and provide access to water, food, cover, den sites, or other necessary resources. A travel route is generally preferred by a species because it provides the least amount of topographic resistance in moving from one area to another yet still provides adequate food, water, or cover.
- Wildlife crossings are small, narrow areas of limited extent that allow wildlife to bypass an obstacle or barrier. Crossings typically are man-made and include culverts, underpasses, drainage pipes, bridges, and tunnels to provide access past roads, highways, pipelines, or other physical obstacles. Wildlife crossings often represent "choke points" along a movement corridor because the useable habitat is physically constricted at the crossing by human-induced changes to the surrounding areas.

Regarding the project site, natural and developed portions of the BSA are likely both used by wildlife on a regular basis during normal foraging, migration, nesting, and denning activities. There are no known, widespread, wildlife corridor studies that include the BSA. The California Department of Fish and Wildlife (CDFW) maintains geographic information system data for "Missing Linkages" (that is, wildlife corridors) derived from the California Essential Habitat Connectivity Project, which is the best available information on important areas needed for maintaining connectivity between large blocks of land for wildlife corridor purposes. Essential Connectivity Areas are intended to be a broad-scale representation of areas that provide essential connectivity. The BSA does not fall within an Essential Connectivity Area; the nearest Essential Connectivity Area is the Temblor Range approximately 5 to 10 miles west of the Belridge oilfields.

Local Setting

The project site is located within the Central Valley portion of unincorporated Kern County and is comprised of forty-five parcels within the administrative boundaries of the Belridge oilfields. The Belridge oilfields are contiguous and located west of SR 33, approximately 7 miles southwest of the community of Lost Hills (population 2,370). Together, the two Belridge oilfields cover an area of approximately 13 miles long and 3 miles wide. Aera Energy is the primary operator within both oilfields.

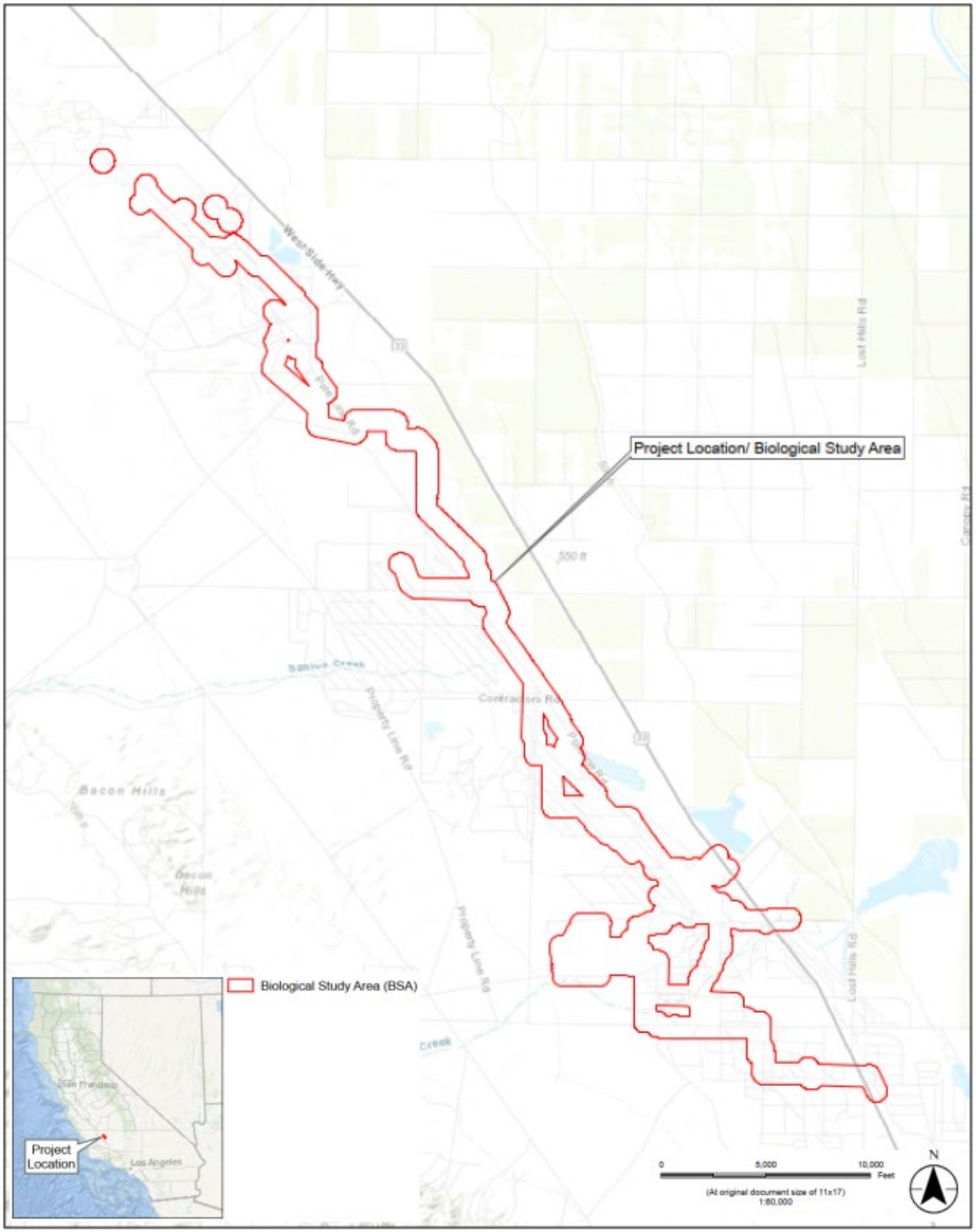
The project area is characterized by heavy oil and gas exploration and production including existing well pads, processing facilities, pipeline routes, and access roads. Development in the surrounding area is predominantly oil and gas production, agriculture, and municipalities such as the towns of Lost Hills, Buttonwillow, and McKittrick (Figure 4.4-1). The project area boundaries encompass a mix of parcels that have been owned and used for oil and gas production or on which leases have been acquired by the project proponent (Figure 4.4-2).

The BSA includes all areas that could be directly and indirectly affected by the proposed project. The BSA for the project totals approximately 3,252 acres and is shown on Figure 4.4-3. The BSA includes the project footprint, the proposed construction areas, all areas of temporary and permanent impacts, and the areas within a 500-foot buffer extending outward from the project construction area and facilities, including on either side of the pipeline alignment and around all project-related infrastructure. The 500-foot buffer was chosen to include potential direct and indirect project impacts on plant and wildlife species from construction activity.

Figure 4.4-1: Regional Location and Biological Study Area (BSA)

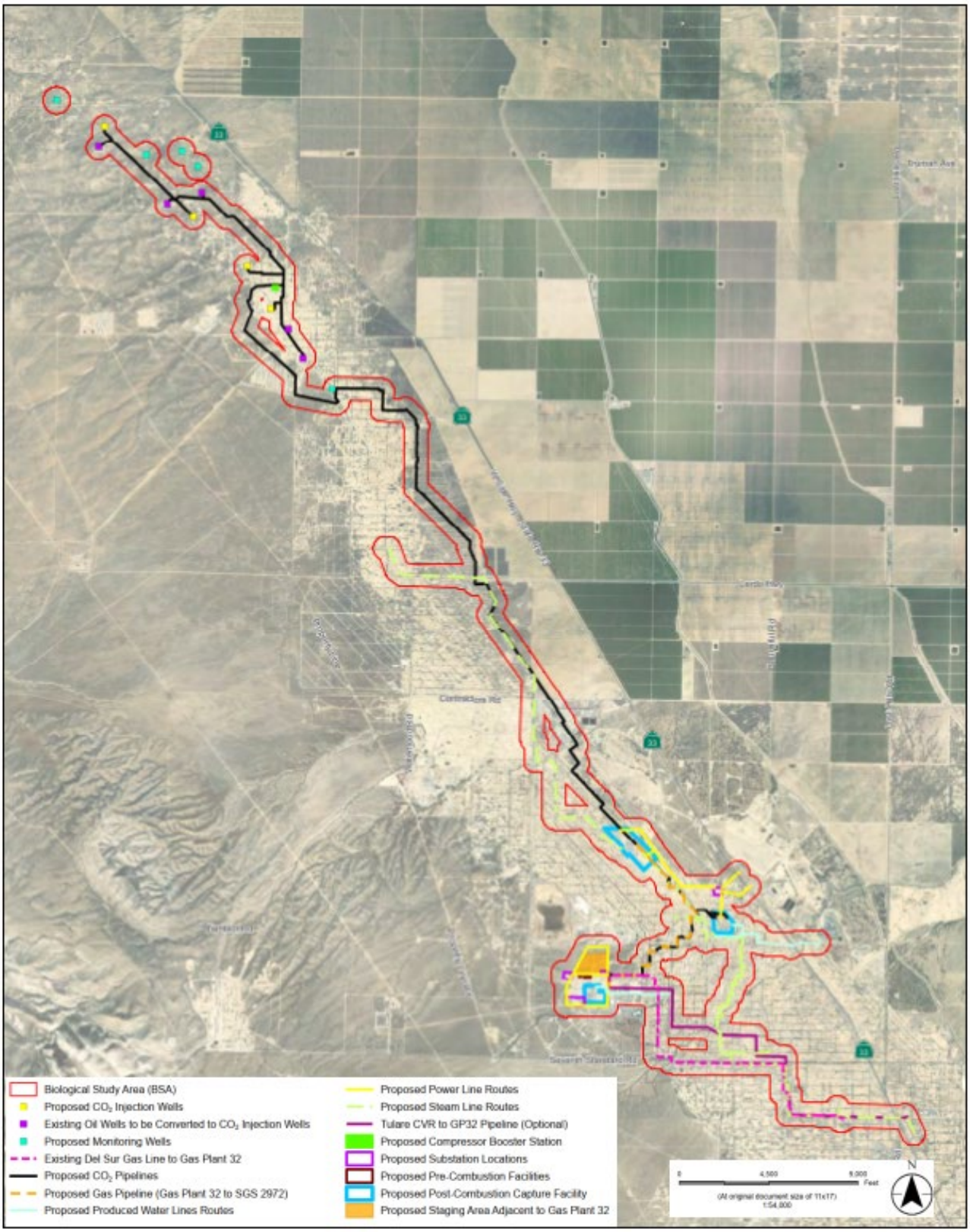
Source: Stantec 2023

Figure 4.4-2: Location and Biological Study Area (BSA)



Source: Stantec 2023

Figure 4.4-3: Biological Study Area and Project Components



Source: Stantec 2023

Vegetation

Two habitat types, Allscale Shrub and Red Brome or Mediterranean Grass Grasslands, were present within the BSA. The most prevalent habitat type within the BSA was Allscale Shrub. The Biological Resources Technical Report in Appendix C-1 identified 37 special-status plant species known or with the potential to occur in the vicinity of the project. Nineteen of these species were determined to have the potential to occur on the project site because the project supports suitable habitat, is located within the species' known range, and/or the species is documented in or near the project.

Soil Types

Prior to conducting the field reconnaissance, historic soils data from the Natural Resources Conservation Service was used to determine potential soil types that may occur within the BSA, including where hydric soils may have historically occurred (Appendix C-1, Figure 4.4-4). Characteristics of soils present on the site are summarized in Table 4.4-2.

Table 4.4-2: Historic Soils Occurring within the BSA

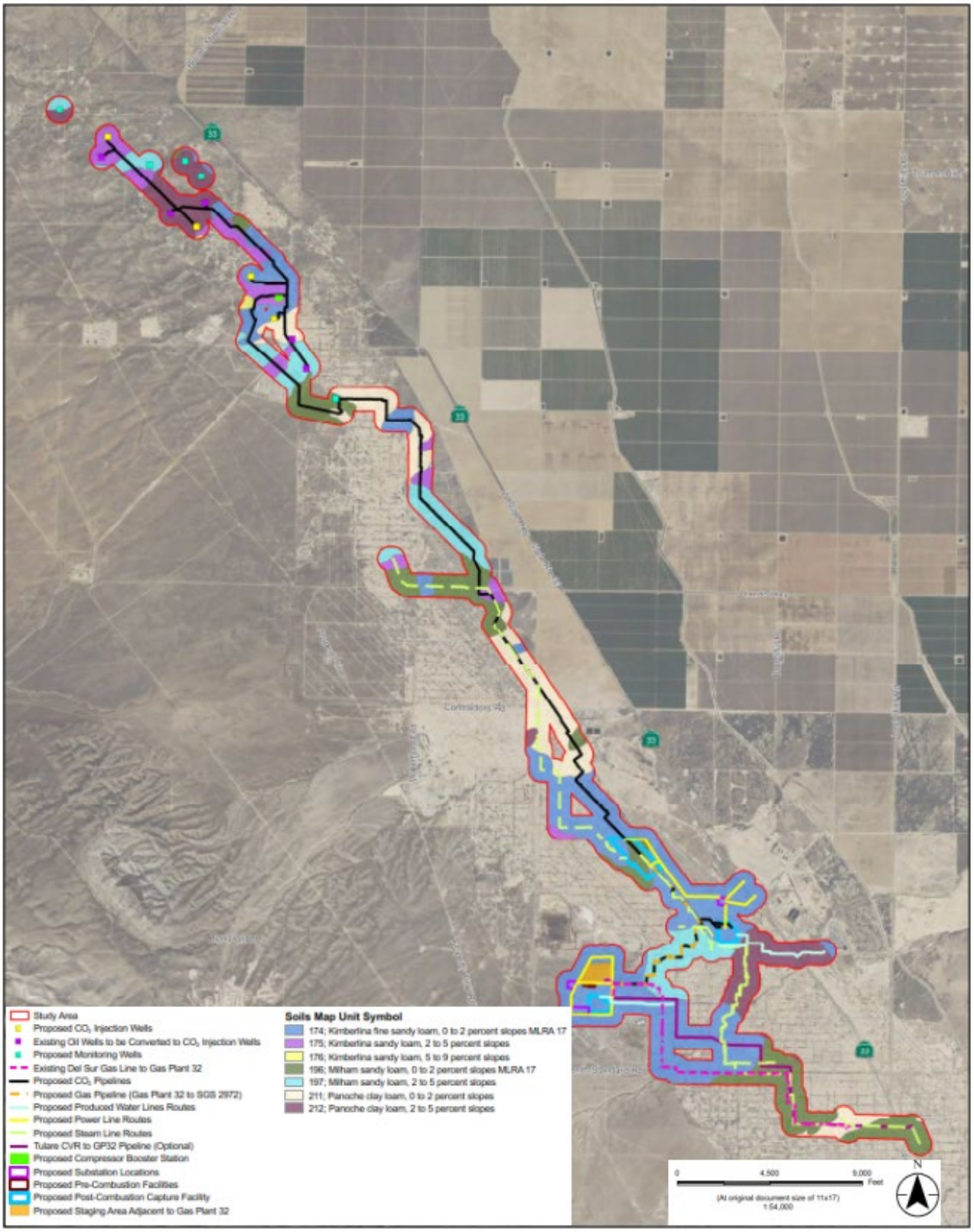
Map Unit Symbol	Map Unit Name	Description	Hydric	Acreage in BSA
174	Kimberlina fine sandy loam, 0-2% slopes	The Kimberlina series consists of very deep, well-drained soils on flood plains and recent alluvial fans. These soils formed in mixed alluvium derived dominantly from igneous and/or sedimentary rock sources.	No	1,302.67
175	Kimberlina fine sandy loam, 2-5% slopes	The Kimberlina series consists of very deep, well-drained soils on flood plains and recent alluvial fans. These soils formed in mixed alluvium derived dominantly from igneous and/or sedimentary rock sources.	No	232.04
176	Kimberlina fine sandy loam, 5-9% slopes	The Kimberlina series consists of very deep, well-drained soils on flood plains and recent alluvial fans. These soils formed in mixed alluvium derived dominantly from igneous and/or sedimentary rock sources.	No	7.90
196	Milham sandy loam, 0 to 2 percent slopes Major Land Resource Area	The Milham series consists of very deep, well-drained soils on alluvial fans, plains, low terraces, and fan remnants. These soils formed in mixed calcareous alluvium weathered from granitic and sedimentary	No	547.25
197	Milham sandy loam, 2 to 5 percent slopes	The Milham series consists of very deep, well-drained soils on alluvial fans, plains, low terraces, and fan remnants. These soils formed in mixed calcareous alluvium weathered from granitic and sedimentary	No	394.53
211	Panoche clay loam, 0 to 2 percent slopes	The Panoche series consists of very deep, well-drained soils on alluvial fans and flood plains. These soils formed in loamy calcareous alluvium from sedimentary rock.	No	445.81

Table 4.4-2: Historic Soils Occurring within the BSA

Map Unit Symbol	Map Unit Name	Description	Hydric	Acreage in BSA
212	Panoche clay loam, 2 to 5 percent slopes	The Panoche series consists of very deep, well-drained soils on alluvial fans and flood plains. These soils formed in loamy calcareous alluvium from sedimentary rock.	No	344.78
Total				**3,274.97**

Key:
BSA = biological study area

Figure 4.4-4: Historic Soils



Source: Stantec 2023

Hydrology

The project area is located in the Kern County Subbasin (Subbasin), which is bounded by the Kern County Line to the north, the granitic bedrock of the Sierra Nevada foothills to the east, the Tehachapi mountains to the southeast, and the marine sediments of the San Emigdio Mountains and Coast Ranges to the southwest and west. As described in Section 4.10, *Hydrology and Water Quality*, the water-bearing unit is the Tulare Formation, which contains up to 2,200 feet of interbedded, oxidized to reduced sands, and gypsiferous clays and gravels derived predominantly from Coast Range sources.

Folding and faulting from the deformation of geologic structures have caused unconformities between geologic formations, including a fold belt that extends from Kettleman Hills at the north through Lost Hills to Elk Hills at the southern end. The Elk Hills fold is identified as a restrictive structure that serves as a barrier to groundwater movement because of its angular unconformities and contacts with crystalline and consolidated sedimentary rocks at the Subbasin margins. Water quality is characterized as primarily sodium sulfate to calcium sodium sulfate type.

The aquatic delineation was conducted within the project area on June 1, July 18, July 20, and September 13, 2022; and May 26 and June 13, 2023. As described in Appendix C-2, because the project area contains no surface water bodies, there are no surface water beneficial uses associated with the project area. Additionally, as discussed in Section 4.10, *Hydrology and Water Quality*, the project is located in three Flood Insurance Rate Map (FIRM) areas (FIRMs 06029C1175E, 06029C1675E, and 06029C1700E). Federal Emergency Management Agency (FEMA) has designated the central and southern portions of the project site as Zone A, which is identified as areas with a 1 percent annual chance of flooding. All other portions of the project site are located in an area designated by the FEMA as Zone X, which is identified as areas that experience minimal flooding, and are outside of the 0.2 percent annual chance floodplain.

Land Cover Types

Biological resources observed within the BSA during the field survey were comprised primarily of common plant species and vegetation communities characteristic of the southern San Joaquin Valley. The extent and condition of vegetation communities within the BSA varied depending on the level of existing development and ongoing mineral extraction activities. Within the BSA, two plant communities and one landcover type were mapped. These illustrated on Figure 4.4-5 and depicted in Appendix C-1. Acreages for each plant community and land cover type are provided in Table 4.4-3.

Atriplex polycarpa Shrubland Alliance (Allscale Shrub)

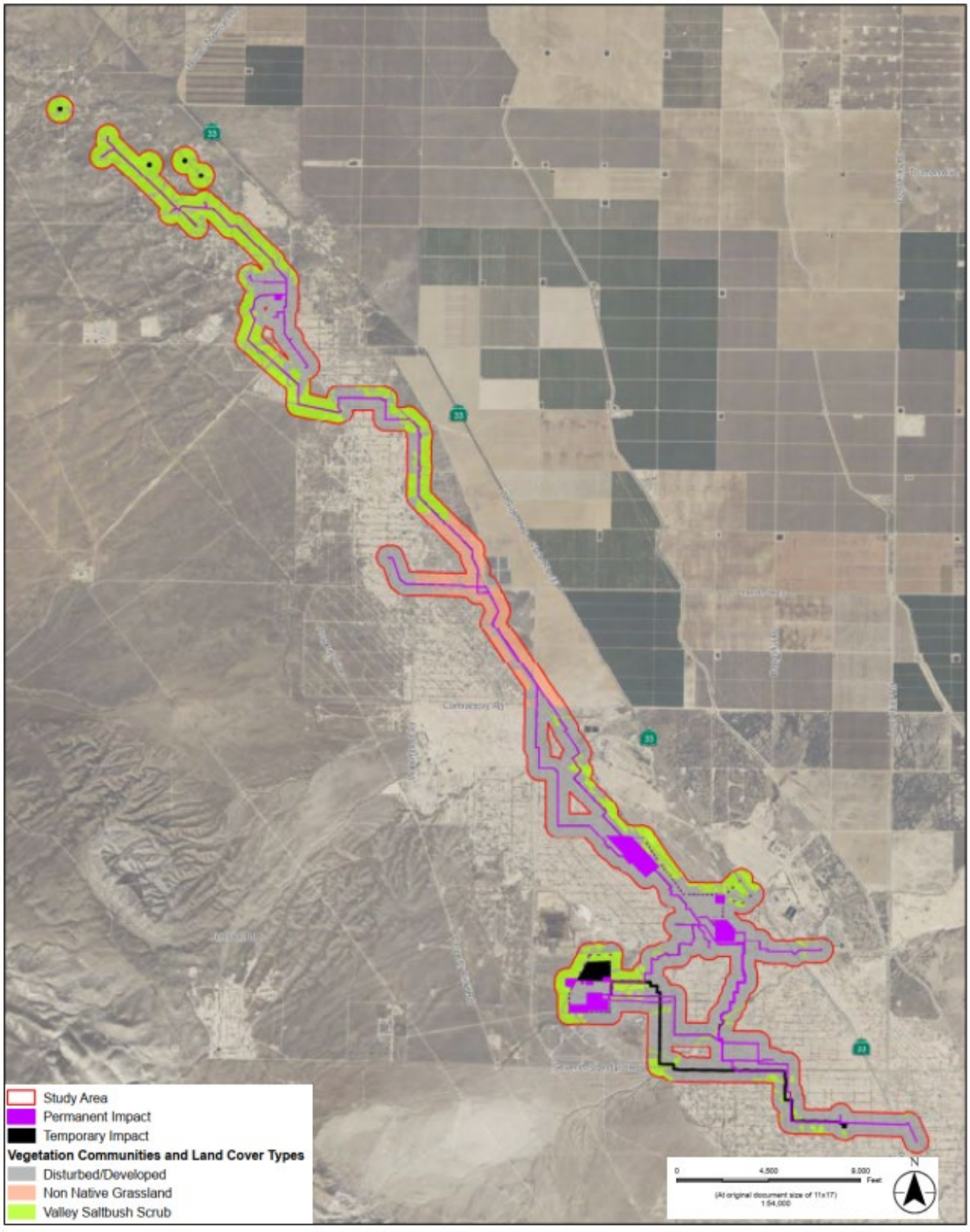
Allscale (*Atriplex polycarpa*) Scrub occurs primarily in the northern half of the BSA, where it has formed relatively open stands and/or is interspersed with annual grasslands described below. Patches of Allscale. Scrub also occur in the southern half of the BSA but are degraded by their vicinity to intensive oil field operations. Allscale Scrub is characterized by an open to continuous canopy with a variable herbaceous layer near the ground, which includes seasonal annuals and non-native grasses. Within the BSA this alliance consists primarily of allscale saltbush (*Atriplex*

polycarpa) with a varied herbaceous layer that consists of *Bromus* sp. Commonly known as salt-scrub or saltbush scrub communities, these common arid-land upland communities are found in flat or hilly areas of the southern San Joaquin Valley and are typically characterized by alkaline soils and open canopy with interspersed shrubs with varying densities dependent on slope, aspect, and moisture levels. Approximately 870.28 acres of this land cover type occur within the BSA (Figure 4.4-5, Table 4.4-3).

Red Brome/Mediterranean Grass Grasslands Herbaceous Semi-Natural Alliance (Red Brome or Mediterranean Grass Grasslands)

Non-native annual grasslands primarily occur toward the central section of the BSA, with an extensive stand located east of Pole Line Road. This vegetation community is also often interspersed with Allscale Scrub. Red Brome or Mediterranean Grass Grasslands consist primarily of non-native grasses from the Mediterranean region such as red brome (*Bromus madritensis* ssp. r*ubens*) and Mediterranean grass (*Schismus barbatus*). Red Brome or Mediterranean Grass Grasslands are typically observed in disturbed and non-disturbed habitats along roadsides, railroads, and cultivated fields. This vegetation community is highly invasive and widely distributed in the western United States and provides a source of fuel for wildfires. Approximately 225.49 acres of this land cover type occur within the BSA (Figure 4.4-4, Table 4.4-3).

Figure 4.4-5: Vegetation Communities and Land Cover Types



Source: Stantec 2023

Disturbed/Developed

This classification was used to map portions of the project site that are developed; primarily existing roadways and development as related to oil and gas operations for mineral extraction. Where vegetated, these areas are generally composed of sparse occurrences of non-native and ruderal vegetation both within and in the margins of the mapped areas. Approximately 2,179.20 acres of this land cover type occur within the BSA (Figure 4.4-5; Table 4.4-3).

Table 4.4-3: Vegetation Communities and Land Cover Types Occurring within the BSA and Estimated Permanent and Temporary Impacts

Vegetation Community/Land Cover Type	Acreage Within BSA	Acreage of Permanent Project Impacts[a]	Acreage of Temporary Project Impacts[b]
Disturbed/Developed	2,179.20	86.63	170.73
Allscale Shrubland	870.28	1.57	43.09
Red Brome or Mediterranean Grass Grasslands	225.49	0.86	4.74
Total	**3,274.97**	**89.06**	**218.56**

Note:

[a] Potential sources of permanent project impacts include clearing and grubbing and construction of the carbon capture facility structure, pipeline supports (assuming the pipelines and distribution piping would be above-ground and elevated), and injection and monitoring wellheads. Permanently impacted areas would result in permanent structures with no revegetation/restoration.

[b] Potential sources of temporary project impacts include the use of heavy equipment and worker foot traffic along the construction corridor, access and staging, temporarily graded and grubbed areas, and future maintenance activities. Temporarily impacted areas would be revegetated/restored.

Common Plant Species Observed

Plants observed during the 2022 reconnaissance-level surveys and 2023 spring-time floristic surveys, were recorded. The survey resulted in the documentation of 78 species of native and non-native plants within the BSA, as listed in Table 4.4-4.

Table 4.4-4: Plant Species Observed within the BSA

Scientific Name	Common Name
Aizoaceae	
*Mesembryanthemum nodiflorum**	slender iceplant
Amaranthaceae	
Atriplex polycarpa	cattle spinach
*Bassia scoparia**	kochia
*Chenopodium album**	common lambs quarters
Asteraceae	
Ambrosia acanthicarpa	annual bur-sage
Baccharis pilularis	coyote brush
*Centaurea melitensis**	tocalote
Centromadia sp.	tarweed
Deinandra pallida	Kern tarweed
Ericameria nauseosa	rubber rabbitbrush

Table 4.4-4: Plant Species Observed within the BSA	
Scientific Name	**Common Name**
Gutierrezia californica	California matchweed
Helianthus annuus	annual sunflower
Heterotheca grandiflora	telegraph weed
Isocoma acradenia var. *bracteosa*	alkali goldenbush
*Lactuca serriola**	prickly lettuce
Lasthenia californica	California goldfields
Layia glandulosa	white layia
Madia elegans	common madia
Malacothrix coulteri	snake's-head
Matricaria discoidea	pineapple weed
*Senecio vulgaris**	common groundsel
Sonchus asper ssp. *asper**	prickly sow thistle
Stephanomeria pauciflora	wire-lettuce
Boraginaceae	
Amsinckia menziesii	small-flowered fiddleneck
Amsinckia sp.	fiddleneck
Amsinckia tessellata	desert fiddleneck
Pectocarya linearis	sagebrush combseed
Phacelia ciliata	Great Valley phacelia
Plagiobothrys canescens	valley popcornflower
Brassicaceae	
*Brassica nigra**	black mustard
*Brassica tournefortii**	Saharan mustard
Descurainia pinnata	tansy mustard
*Hirschfeldia incana**	summer mustard
Lepidium nitidum	peppergrass
*Sisymbrium irio**	London rocket
*Sisymbrium orientale**	Oriental mustard
Tropidocarpum gracile	slender tropidocarpum
Bryaceae	
Bryum argenteum	silvery bryum
Caryophyllaceae	
*Herniaria hirsuta**	hairy rupturewort
Spergularia sp.	sand spurry
Chenopodiaceae	
Atriplex polycarpa	allscale saltbush
*Salsola tragus**	Russian thistle
Suaeda nigra	bush seepweed

Table 4.4-4: Plant Species Observed within the BSA	
Scientific Name	**Common Name**
Crassulaceae	
Crassula connata	pygmy-weed
Cucurbitaceae	
Cucurbita palmata	coyote melon
Euphorbiaceae	
Croton setiger	doveweed
Euphorbia ocellata	Contura Creek spurge
Euphorbia polycarpa	ribseed sandmat
Fabaceae	
Acmispon wrangeleanus	Chilean trefoil
Astragalus lentiginosus	freckled milk vetch
*Medicago polymorpha**	California burclover
Geraniaceae	
*Erodium cicutarium**	redstem filaree
*Erodium moschatum**	whitestem filaree
Lamiaceae	
*Marrubium vulgare**	white horehound
Malvaceae	
Eremalche parryi	Parry's mallow – only one flowering plant with bisexual (non-pistillate) flowers was observed; characteristics tend to be consistent with the much more common *E. parryi* ssp. *parryi* rather than *E. parryi* ssp. *kernensis*
*Malva parviflora**	cheeseweed
Onagraceae	
Camissonia contorta	plains evening primrose
Orobanchaceae	
Castilleja attenuata	narrow leaved owl's clover
Plantaginaceae	
Plantago erecta	California plantain
Plantago ovata	Desert plantain
Poaceae	
*Avena fatua**	wild oats
*Bromus diandrus**	ripgut grass
*Bromus hordeaceus**	soft-chess grass
Bromus madritensis ssp. *rubens**	red brome
Distichlis spicata	salt grass
Festuca microstachys	small fescue
Hordeum murinum ssp. *leporinum**	hare barley
Melica imperfecta	California melic
*Phalaris aquatica**	bulbous canarygrass

Table 4.4-4: Plant Species Observed within the BSA	
Scientific Name	**Common Name**
*Phalaris caroliniana**	Carolina canarygrass
*Polypogon monspeliensis**	annual beard grass
*Schismus barbatus**	Mediterranean grass
Polemoniaceae	
Gilia minor	little gilia
Polygonaceae	
Eriogonum angulosum	angle stem buckwheat
Pottiaceae	
Tortula muralis	wall-screw moss
Solanaceae	
Datura wrightii	Jimson weed
Tamaricaceae	
Tamarix sp.*	tamarisk
Themidaceae	
Dipterostemon capitatus ssp. *capitatus*	blue dicks
Note: *Denotes non-native species	

Sensitive Natural Communities

Special-status natural communities are defined by CDFW (2009) as "...communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects." All vegetation within the State is ranked with an "S" rank, however, only those that are of special concern (S1-S3 rank) are generally evaluated under the California Environmental Quality Act (CEQA). Allscale Scrub/Shrubland is located sporadically throughout the BSA and is most common in the northern half of the BSA; this habitat type is used by a variety of special-status species, but it only has a State rarity rank of S4 and is not considered sensitive.

Critical Habitat

A literature review was conducted before the field surveys and it was determined that no critical habitat occurs within the BSA (Appendix C-1). The nearest designated critical habitat units include (1) a critical habitat unit for Buena Vista Lake ornate shrew (*Sorex ornatus relictus*) located approximately 13.8 miles east of the BSA, (2) a critical habitat unit for vernal pool fairy shrimp (*Branchinecta lynchi)* located approximately 13.8 miles southwest of the BSA, and (3) a critical habitat unit for California tiger salamander (*Ambystoma californiense*) located approximately 18.1 miles northwest of the BSA. The BSA is also located outside of the known respective ranges of these species.

Wetlands and Waters

Potential Jurisdictional Features

Activities pursuant to Section 401 of the federal CWA are regulated by the U.S. Army Corps of Engineers (USACE) Regulatory Program; activities listed under the California Fish and Game Code (CFGC) Sections 1600-1607 are regulated by the CDFW; and activities listed under Section 401 of the CWA and the California Porter-Cologne Water Quality Control (Porter-Cologne) Act are regulated by the RWQCB.

Potential jurisdictional aquatic features observed in the BSA include sections of Chico Martinez Creek, remnants of ephemeral streams, and various drainage ditches; these features may also be regulated as jurisdictional features by CDFW (Appendix C-1, Figure 4.4-6). Potential jurisdictional features are described in the Jurisdictional Delineation Report in Appendix C-2.

Preliminary Jurisdictional Determination

The potential jurisdictional waters (in acres, square feet, and linear feet) for the delineated resources within the BSA and footnotes summarizing the key characteristics of potential jurisdictional waters for each agency and regulatory jurisdiction are listed in Table 4.4-5.

Table 4.4-5: Preliminary Jurisdictional Water Totals in the BSA

Potential Jurisdictional Waters[1]	Acres	Square Feet	Linear Feet
USACE			
N/A[2]	N/A	N/A	N/A
Total Potential USACE Jurisdiction	**N/A**	**N/A**	**N/A**
RWQCB			
Waters of the State (Drainage Ditch between Main Camp Road and Gas Plant 32)	0.189	8,229	411
Waters of the State (Drainage Ditch along the west side of Pole Line Road and north of Tulare Road)	0.155	6,741	602
Waters of the State (Streambed of Remnant Ephemeral Stream south of Contractors Road)	1.008	43,907	1,711
Waters of the State (Streambed of Remnant Sections of Zemorra Creek south of Main Camp Road)	1.195	52,030	1,446
Chico Martinez Creek (Streambed)	6.920	301,413	6,247
Total Potential RWQCB Jurisdiction	**9.467**	**412,320**	**10,417**
CDFW			
Drainage Ditch between Main Camp Road and Gas Plant 32	0.189	8,229	411

Table 4.4-5: Preliminary Jurisdictional Water Totals in the BSA			
Potential Jurisdictional Waters[1]	**Acres**	**Square Feet**	**Linear Feet**
Drainage Ditch along the west side of Pole Line Road and north of Tulare Road	0.155	6,741	602
Streambed of Remnant Ephemeral Stream south of Contractors Road	1.008	43,907	1,711
Streambed of Remnant Sections of Zemorra Creek south of Main Camp Road	1.195	52,030.16	1,446
Streambed of Chico Martinez Creek	6.920	301,413	6,247
Total Potential CDFW Jurisdiction	**9.467**	**412,320**	**10,417**

Notes:

[1] Areas of potential jurisdiction are subject to final verification and approval by the regulatory agencies (i.e., USACE, RWQCB, and CDFW).

[2] No potential federal waters of the United States were delineated with the biological study area due to the lack of an ordinary high water mark and/or no evident connectivity to any other federal waters of the United States recognized as a traditional navigable water.

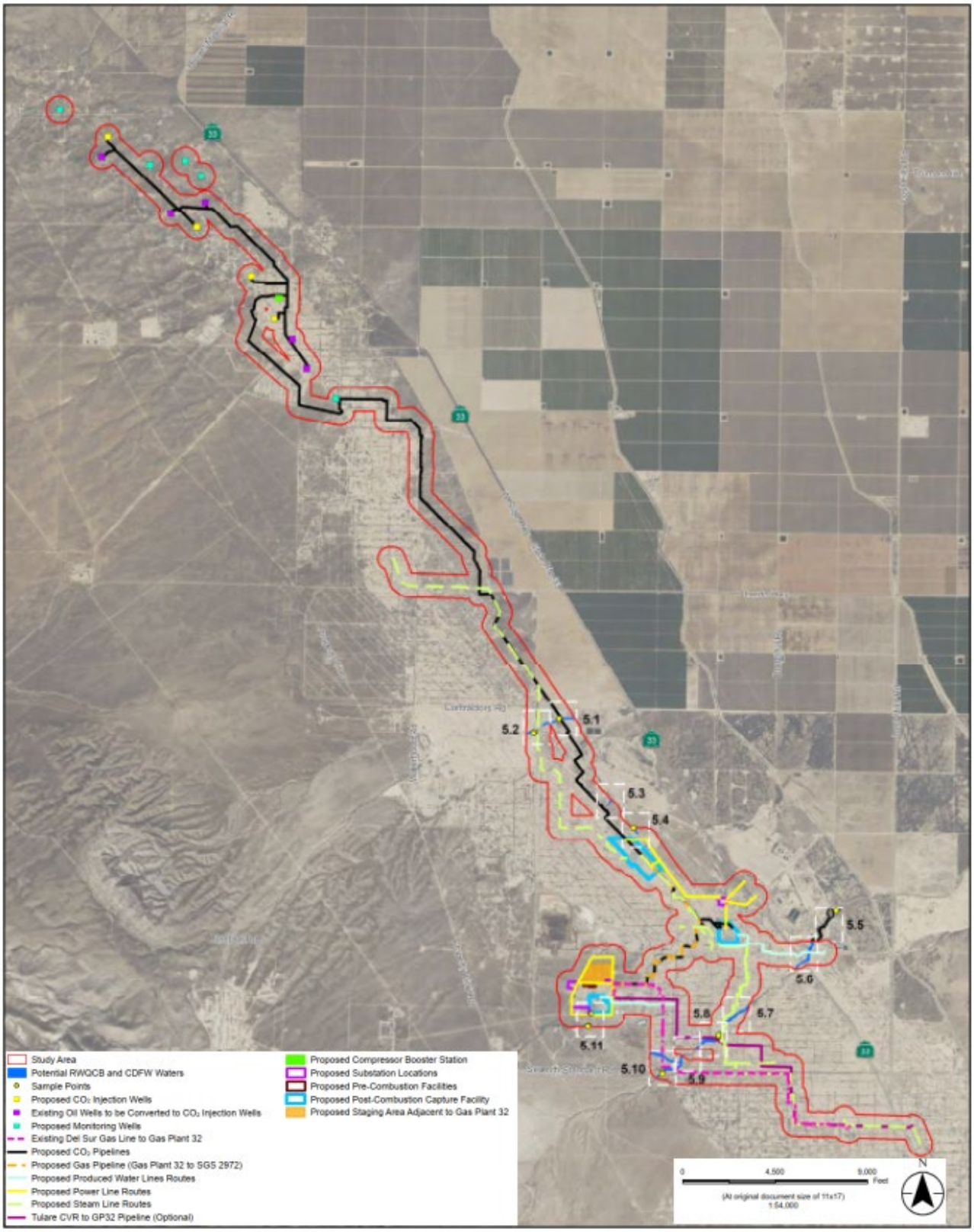
Key:

CDFW = California Department of Fish and Wildlife

USACE = U.S. Army Corps of Engineers

RWQCB = Regional Water Quality Control Board

Figure 4.4-6: Potential Jurisdictional Waters



Source: Stantec 2023

Wildlife Refuges and Protected Habitat Areas

The BSA does not overlap with any federally or State-designated wildlife refuges or protected habitat areas.

Plant and Wildlife Species Summary

Information presented in Appendix C-1 was used to generate a list of special-status natural communities and special-status plant and animal taxa that either occur or may have the potential to occur within the BSA or adjacent habitats, or both. For this report, special-status taxa are defined as plants or animals that:

- Have been designated as either rare, threatened, or endangered by the CDFW or the U.S. Fish and Wildlife Service (USFWS), and are protected under either the California or federal Endangered Species Acts;
- Are candidate species being considered or proposed for listing under these same acts;
- Are recognized as Species of Special Concern (SSCs) by the CDFW;
- Are ranked as California Rare Plant Rank (CRPR) 1, 2, 3 or 4 plant species;
- Are Fully Protected by CFGC, Sections 3511, 4700, 5050, or 5515; or
- Are of expressed concern to resource/regulatory agencies or local jurisdictions.

Special-Status Plant Species

A list of special-status plants, including federally and State-listed species and CRPR 1-4 species that are known to occur in the region surrounding the BSA (within 10 miles) is presented in Table 4.4-6. A records search of the California Natural Diversity Database (CNDDB), the CNPS Online Inventory, and the Consortium of California Herbaria was performed for special-status plant taxa and non-protocol plant surveys within the BSA; a map of CNDDB occurrences for special-status plants within a 10-mile radius of the BSA is included in Appendix C-1, Figure 4.4-7. Additionally, spring-time floristic surveys were completed in February, March, and April 2023. Each of the taxa identified in the record searches was assessed for their potential to occur within the BSA based on the following criteria:

- **Present**: Taxa were observed within the BSA during recent botanical surveys or the population has been acknowledged by CDFW, USFWS, or local experts.
- **High**: Both a documented recent record (within 10 years) exists of the taxa within the BSA or immediate vicinity (approximately 5 miles) and the environmental conditions (including soil type) associated with taxa presence occur within the BSA.
- **Moderate**: Both a documented recent record (within 10 years) exists of the taxa within the BSA or the immediate vicinity (approximately 5 miles) and the environmental conditions associated with taxa presence are marginal or limited within the BSA, or both; the BSA is located within the known current distribution of the taxa and the environmental conditions (including soil type) associated with taxa presence occur within the BSA.

- **Low**: A historical record (over 10 years) exists of the taxa within the BSA or general vicinity (approximately 10 miles) and the environmental conditions (including soil type) associated with taxa presence are marginal and/or limited within the BSA.
- **Not Likely to Occur:** The environmental conditions associated with taxa presence do not occur within the BSA.

In regard to special-status plants, a single plant keyed to *Eremalche parryi* was observed west of Pole Line Road during botanical surveys in 2023 (Appendix C-1). The identification and potential regulatory status of this specimen are complicated by the somewhat controversial taxonomy of the Kern mallow and Parry's mallow as explained in Appendix C-1. Considering the information obtained through observation analysis and literature review detailed in Appendix C-1, the specimen cannot be conclusively identified as *E. parryi* ssp. *kernensis* and is most likely the much more common *E. parryi* or *E. parryi* ssp. *parryi*. The potential for occurrence of Kern mallow within the BSA is assessed to be low.

Table 4.4-6: Known and Potential Occurrences of Special-status Plant Taxa within the BSA

Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Allium howellii var. *howellii* Howell's onion	**4.3**	Found in valley and foothill grassland in clay or serpentinite soils between 160 and 7,220 feet (50-2,220 meters) in elevation	Mar-Apr	**Not Likely to Occur:** The nearest occurrence is currently unknown. Suitable habitat/soil for this species does not exist within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Amsinckia furcata forked fiddleneck	**4.2**	Found in cismontane woodland, and valley and foothill grasslands between 160 and 3,280 feet (50-1,000 meters) elevation	Feb-May	**Low:** The nearest occurrence is currently unknown. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Androsace elongata ssp. *acuta* California androsace	**4.2**	Found in chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, and valley and foothill grasslands, between 490 and 4,280 feet (150-1,305 meters) in elevation.	Mar-Jun	**Not Likely to Occur:** The nearest occurrence is currently unknown. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Antirrhinum ovatum oval-leaved snapdragon	**4.2**	Found in chaparral, cismontane woodland, pinyon, and juniper woodland, and valley and foothill grasslands in clay or gypsum and often alkaline soils between 655 and 3,280 feet (200-1,000 meters) in elevation.	May-Nov	**Not Likely to Occur:** The nearest occurrence is approximately 3.5 miles southwest of the BSA; however, this occurrence was recorded in 1962. Suitable habitat/soil for this species does not exist within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.

Table 4.4-6: Known and Potential Occurrences of Special-status Plant Taxa within the BSA

Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Astragalus hornii var. *hornii* Horn's milk-vetch	**1B.1**	Found in meadows, seeps, and playas on lake margins in alkaline soils between 195 and 2,790 feet (60-850 meters) in elevation.	May-Oct	**Not Likely to Occur:** The nearest occurrence is currently unknown. Suitable habitat for this species does not exist within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Astragalus macrodon Salinas milk-vetch	**4.3**	Found in chaparral, cismontane woodlands, valley, and foothill grasslands on sandstone, shale, and serpentine soils, between 820 and 3,115 feet (250-950 meters) in elevation.	Apr-Jul	**Not Likely to Occur:** The nearest occurrence is currently unknown. Suitable habitat/soil for this species does not exist within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Atriplex cordulata var. *cordulata* heartscale	**1B.2**	Found in chenopod scrub, meadows and seeps, and valley and foothill grasslands in sandy, saline, or alkaline soils below 1,835 feet (560 meters) in elevation.	Apr-Oct	**Low:** The nearest occurrence is approximately 9.9 miles east of the BSA. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Atriplex cordulata var. *erecticaulis* Earlimart orache	**1B.2**	Found in valley and foothill grasslands, between 130 and 330 feet (40-100 meters) in elevation.	Aug-Sep (Nov)	**Not Likely to Occur:** The nearest occurrence is currently unknown. Annual grassland habitat exists within the BSA, but the elevation of the BSA is above the known elevational range for the species. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.

Table 4.4-6: Known and Potential Occurrences of Special-status Plant Taxa within the BSA

Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Atriplex coronata var. *coronata* crownscale	**4.2**	Found in valley and foothill grasslands, playas, and vernal pools in alkaline soils between 455 and 1,640 feet (139-500 meters) in elevation.	Mar-Oct	**Low:** The nearest occurrence is currently unknown. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Atriplex coronata var. *vallicola* Lost Hills crownscale	**1B.2**	Found in chenopod scrub, valley and foothill grasslands, and vernal pools in alkaline soils between 160 and 2,085 feet (50-635 meters) in elevation.	Apr-Sep	**Low:** The nearest recorded occurrence is approximately 4.1 miles east of the BSA from 1989, and the most recent occurrence is 8 miles east of the BSA from 2013. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Atriplex flavida Carrizo Plain crownscale	**1B.3**	Found in chenopod scrub, valley and foothill grassland, and vernal pools in alkaline soils between 1,920 feet and 1,985 feet (585-605 meters) in elevation.	Mar-Jul	**Low:** The nearest occurrence is currently unknown. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Canbya candida white pygmy-poppy	**4.2**	Found in Joshua tree woodland, Mojavean desert scrub, and pinyon and juniper woodland in granitic, gravelly, and sandy soils between 1,970 and 4,790 feet (600-1,460 meters) in elevation.	Mar-Jun	**Not Likely to Occur:** The nearest occurrence is currently unknown. Suitable habitat for this species does not exist within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.

Table 4.4-6: Known and Potential Occurrences of Special-status Plant Taxa within the BSA

Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Caulanthus californicus California jewelflower	**FE, SE, 1B.1**	Found in chenopod scrub, pinyon and juniper woodlands, and valley and foothill grasslands in sandy soils between 200 and 3,280 feet (61-1,000 meters) in elevation.	Feb-May	**Low:** The nearest recorded occurrence is approximately 1.2 miles east of the BSA from 1937; however, the most recent occurrence was recorded in 2008 and was 7.6 miles from the BSA. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Caulanthus lemmonii Lemmon's jewelflower	**1B.2**	Found pinyon and juniper woodlands, and valley and foothill grasslands between 260 and 5,185 feet (80-1,580 meters) in elevation.	Feb-May	**Low:** The nearest recorded occurrence is approximately 8.2 miles southwest of the BSA from 2017. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Cirsium crassicaule slough thistle	**1B.1**	Found in chenopod scrub, marshes and swamps, and riparian scrub between 10 and 330 feet (3-100 meters) in elevation.	May-Aug	**Not Likely to Occur:** The nearest recorded occurrence is approximately 9.2 miles east of the BSA from 1954; however, the most recent occurrence was recorded in 1982, 9.8 miles northeast of the BSA. Annual grassland habitat exists within the BSA, but the elevation of the BSA is above the known elevational range for the species. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Clarkia xantiana ssp. *parviflora* Kern Canyon clarkia	**4.2**	Found in chaparral, cismontane woodland, Great Basin scrub, and valley and foothill grassland in roadside, rocky, and sandy soils and on slopes between 2,295 and 11,875 feet (700-3,620 meters) in elevation.	May-Jun	**Not Likely to Occur:** The nearest occurrence is currently unknown. Annual grassland habitat exists within the BSA, but the elevation of the BSA is below the known elevational range for the species. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.

Table 4.4-6: Known and Potential Occurrences of Special-status Plant Taxa within the BSA

Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Delphinium recurvatum recurved larkspur	**1B.2**	Found in chenopod scrub, cismontane woodland, and valley and foothill grasslands in alkaline soils between 5 and 2,590 feet (3-750 meters) in elevation.	Mar-Jun	**Low:** The nearest recorded occurrence is approximately 3.6 miles east of the BSA from 2011. Suitable habitat for this species does exist within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Eremalche parryi ssp. *kernensis* Kern mallow	**FE, 1B.2**	Found in in chenopod scrub, pinyon and juniper woodlands, and valley and foothill grasslands in dry, open sandy to clay soils between 225 and 4,230 feet (70-1,290 meters) in elevation.	(Jan, Feb) Mar-May	**Low:** A single flowering *Eremalche parryi* plant was observed during botanical surveys completed in spring 2023 west of Pole Line Road. The specimen had bisexual (non-pistillate) flowers, and Kern mallow is acknowledged to have populations that have pistillate flowers. The flower characteristics tend to be more consistent with the much more common *E. parry*i ssp. *parryi* rather than *E. parryi* ssp. *kernensis*. The species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Eriastrum hooveri Hoover's eriastrum	**4.2**	Found in chenopod scrub, pinyon and juniper woodlands, and valley and foothill grasslands, sometimes in gravelly soils between 160 and 3,000 feet (50-915 meters) in elevation.	(Feb) Mar-Jul	**Moderate:** The nearest recorded occurrence is within the BSA from 1986. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Eriogonum gossypinum cottony buckwheat	**4.2**	Found in chenopod scrub, and valley and foothill grasslands between 325 and 1,805 feet (100-550 meters) in elevation.	Mar-Sep	**Low:** The nearest occurrence is currently unknown. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.

Table 4.4-6: Known and Potential Occurrences of Special-status Plant Taxa within the BSA

Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Eriogonum nudum var. *indictum* protruding buckwheat	**4.2**	Found in chaparral, chenopod scrub, and cismontane woodland in clay and serpentine soils between 490 and 4,800 feet (150-1,463 meters) in elevation.	(Apr) May-Oct (Dec)	**Not Likely to Occur:** The nearest occurrence is currently unknown. Suitable habitat/soil for this species does not exist within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Eriogonum temblorense Temblor buckwheat	**1B.2**	Found in valley and foothill grasslands in clay or sandstone soils between 990 and 3,280 feet (300-1,000 meters) in elevation.	(Apr) May-Sep	**Not Likely to Occur:** The nearest recorded occurrence is approximately 3.7 miles west of the BSA from 1971; however, the most recent occurrence was recorded in 2011 9 miles southeast of the BSA. Suitable habitat/soil for this species does not exist within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Eschscholzia hypecoides San Benito poppy	**4.3**	Found in chaparral, cismontane woodland, and valley and foothill grassland in clay and serpentine soils between 655 and 4,920 feet (200-1,500 meters) in elevation.	Mar-Jun	**Not Likely to Occur:** The nearest occurrence is currently unknown. Suitable habitat/soil for this species does not exist within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Eschscholzia lemmonii ssp. *kernensis* Tejon poppy	**1B.1**	Found in chenopod scrub, and valley and foothill grasslands between 520 and 3,280 feet (160-1,000 meters) in elevation.	(Feb) Mar-May	**Low:** The nearest occurrence 9.6 miles southeast of the BSA from 2001. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.

Table 4.4-6: Known and Potential Occurrences of Special-status Plant Taxa within the BSA

Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Eschscholzia rhombipetala diamond-petaled California poppy	**1B.1**	Found in valley and foothill grasslands in alkaline or clay soils between 0 and 3,200 feet (0-975 meters) in elevation.	Mar-Apr	**Low:** The nearest recorded occurrence is approximately 9.9 miles southwest of the BSA; however, this occurrence was recorded in 1986. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Fritillaria agrestis stinkbells	**4.2**	Found in chaparral, cismontane woodland, pinyon and juniper woodland, and valley and foothill grasslands in clay soils, and sometimes in serpentine soils, between 30 and 5,100 feet (10-1,555 meters) in elevation.	Mar-Jun	**Not Likely to Occur:** The nearest occurrence is currently unknown. Suitable habitat/soil for this species does not exist within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Lasthenia chrysantha alkali sink goldfields	**1B.1**	Found in vernal pools in alkaline soils between 0 and 655 feet (0-200 meters) in elevation.	Feb-Apr	**Not Likely to Occur:** The nearest recorded occurrence is approximately 8.6 miles northeast of the BSA; however, this occurrence does not have a recorded date. Suitable habitat does not exist within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Lasthenia ferrisiae Ferris' goldfields	**4.2**	Found in vernal pools in alkaline and clay soils between 65 and 2,295 feet (20-700 meters) in elevation.	Feb-May	**Not Likely to Occur:** The nearest occurrence is currently unknown. Suitable habitat for this species does not exist within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.

Table 4.4-6: Known and Potential Occurrences of Special-status Plant Taxa within the BSA

Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Lasthenia glabrata ssp. *coulteri* Coulter's goldfields	**1B.1**	Found in coastal salt marshes and swamps, playas, and vernal pools below 4,005 feet (1,220 meters) in elevation.	Feb-Jun	**Not Likely to Occur:** The nearest recorded occurrence is approximately 4.9 miles east of the BSA in 2010. Suitable habitat for this species does not exist within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Layia heterotricha pale-yellow layia	**1B.1**	Found in cismontane woodland, coastal scrub, pinyon and juniper woodlands, and valley and foothill grasslands in alkaline or clay soils between 980 and 5,595 feet (300-1,705 meters) in elevation.	Mar-Jun	**Low:** The nearest recorded occurrence is approximately 5.9 miles west of the BSA from 1954; however, the most recent occurrence was recorded in 1955 8.6 miles southwest of the BSA. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Layia munzii Munz's tidy-tips	**1B.2**	Found in chenopod scrub, and valley and foothill grasslands in alkaline clay soils between 490 and 2,295 feet (150-700 meters) in elevation.	Mar-Apr	**Not Likely to Occur:** The nearest recorded occurrence is approximately 7.5 miles north of the BSA in 1954; however, the most recent occurrence was recorded in 1988 7.9 miles northeast of the BSA. Suitable habitat/soil for this species does not exist within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Madia radiata showy golden madia	**1B.1**	Found in cismontane woodland and valley and foothill grasslands between 80 and 3,985 feet (25-1,215 meters) in elevation.	Mar-May	**Low:** The nearest recorded occurrence is approximately 4.3 miles east of the BSA from 1992; however, the most recent occurrence was recorded in 2008, 5.7 miles east of the BSA. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.

Table 4.4-6: Known and Potential Occurrences of Special-status Plant Taxa within the BSA

Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Monolopia congdonii San Joaquin woollythreads	**FE, 1B.2**	Found in chenopod scrub, and valley and foothill grasslands, in sandy soils between 195 and 2,625 feet (60-800 meters) in elevation.	Feb-May	**Low:** The nearest recorded occurrence is approximately 0.84 miles west of the BSA from 2008. However, the most recent occurrence was from 2019, 8.2 miles northeast of the BSA. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Puccinellia simplex California alkali grass	**1B.2**	Found in chenopod scrub, meadows and seeps, valley and foothill grassland, and vernal pools in sinks, alkaline soils, flats, lake margins, and mesic vernal pools between 5 and 3,050 feet (2-930 meters) in elevation.	Mar-May	**Low:** The nearest recorded occurrence is approximately 7.6 miles east of the BSA from 1983. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Stylocline citroleum oil neststraw	**1B.1**	Found in chenopod scrub, coastal scrub, and valley and foothill grasslands in clay soils between 160 and 1,310 feet (50-400 meters) in elevation.	Mar-Apr	**Not Likely to Occur:** The nearest occurrence is 8.3 miles southeast of the BSA from 2011. Suitable habitat/soil for this species does not exist within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.
Trichostema ovatum San Joaquin bluecurls	**4.2**	Found in chenopod scrub and valley and foothill grassland between 215 and 1,050 feet (65-320 meters) in elevation.	(Apr-Jun) Jul-Oct	**Low:** The nearest occurrence is currently unknown. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.

Table 4.4-6: Known and Potential Occurrences of Special-status Plant Taxa within the BSA

Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Tropidocarpum californicum King's gold	**1B.1**	Found in chenopod scrub between 210 and 590 feet (65-180 meters) in elevation.	Feb-Mar	**Low:** The nearest occurrence is currently unknown. Suitable habitat for this species exists within the BSA. The species was not observed in the BSA during appropriately timed floristic botanical surveys. However, the species is known to occur in the region surrounding the BSA (within 10 miles) and could potentially be present within fragments of Allscale Shrubland, Red Brome, or Mediterranean Grassland habitats within the BSA.

Source: CDFW 2022; CNPS 2022

Notes:

* Months appearing in parenthesis listed under blooming periods above indicates and additional but uncommon blooming period for that specific species.

Status Codes

Federal Designation

FE Federally Endangered

FT Federally Threatened

State Designation

SE State Endangered

SR State Rare

CRPR Designation

1B Plants rare, threatened, or endangered in California and elsewhere.

2B Plants presumed extinct in California but more common elsewhere.

4 Plants of limited distribution – a watch list

1 Seriously threatened in California (high degree/immediacy of threat).

2 Fairly threatened in California (moderate degree/immediacy of threat).

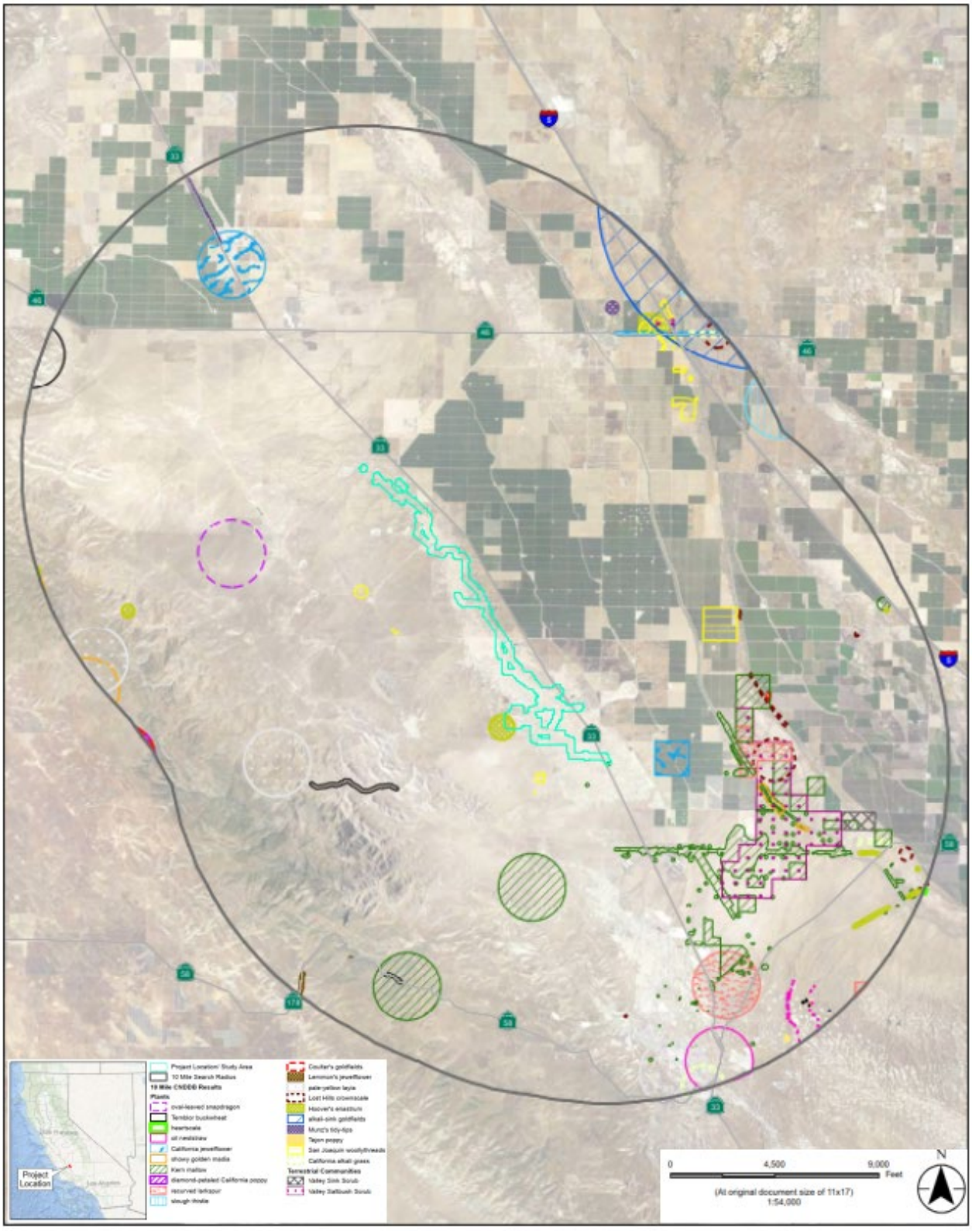
3 Not very threatened in California (low degree/immediacy of threats or no current threats known).

Key:

BSA = biological study area

CRPR = California Rare Plant Rank

Figure 4.4-7: Plants and Terrestrial Communities



Source: Stantec 2023

Special-Status Animal Species

Special-status taxa include those listed as threatened or endangered under the federal or California Endangered Species Acts, taxa proposed for such listing, SSCs, and other taxa that have been identified by the USFWS, CDFW, or local jurisdictions as unique or rare and that have the potential to occur within the BSA.

The CNDDB was queried for occurrences of special-status wildlife taxa within a 10-mile radius around the BSA; a map of CNDDB occurrences for special-status wildlife within a 10-mile radius of the BSA is shown on Figure 4.4-8. The specific habitat requirements and the locations of known records of occurrence of each special-status wildlife species were the principal criteria used for inclusion in the list of taxa potentially occurring within the BSA. Other wildlife species added for consideration include loggerhead shrike, which is an SSC that was observed in the BSA during reconnaissance surveys, California horned lark, which is a CDFW Watch List species observed during protocol blunt-nosed leopard lizard (BNLL) surveys, and Buena Vista Lake ornate shrew, which is a federal endangered species requested for consideration in a CDFW comment letter on the project CEQA Notice of Preparation. The special-status wildlife taxa known to occur (within 10 miles), and their potential for occurrence in the BSA, are summarized in Table 4.4-7. Each of the taxa identified in the database reviews/searches was assessed for its potential to occur within the BSA based on the following criteria:

- **Present:** Taxa (or sign) were observed in the BSA or in the same watershed (aquatic taxa only) during the most recent surveys, or a population has been acknowledged by the CDFW, USFWS, or local experts.
- **High:** Habitat (including soils) for the taxa occurs on site and a known occurrence occurs within the BSA or adjacent areas (within 5 miles of the BSA) within the past 20 years; however, these taxa were not detected during the most recent surveys.
- **Moderate:** Habitat (including soils) for the taxa occurs on site and a known regional record occurs within the database search, but not within 5 miles of the BSA or within the past 20 years, or a known occurrence occurs within 5 miles of the BSA and within the past 20 years and marginal or limited amounts of habitat occurs on site, or the taxa's range includes the geographic area and suitable habitat exists.
- **Low:** Limited habitat for the taxa occurs on site and no known occurrences were found within the database search and the taxa's range includes the geographic area.
- **Not Likely to Occur:** The environmental conditions associated with taxa presence do not occur within the BSA.

Table 4.4-7: Known and Potential Occurrences of Special-Status Wildlife within the BSA			
Species	**Status**	**Habitat Requirements**	**Potential to Occur**
AMPHIBIANS			
Spea hammondii western spadefoot	**SSC**	Occurs in Central Valley grasslands and adjacent foothills, although some populations can be found in pine-oak woodlands of the valley foothills. Require shallow, temporary pools or steams during the breeding season. Resides in burrows most of the year.	**Low:** The nearest recorded occurrence is approximately 6 miles northeast of the BSA. Suitable upland habitat for this species is present in the BSA but there is no likely suitable breeding habitat. Not observed during reconnaissance surveys.
BIRDS			
Agelaius tricolor tricolored blackbird	**ST, SSC, BCC**	Occurs throughout the San Joaquin Valley. Utilizes irrigated crops for foraging and typically nests in marshes wetlands with cattails, bulrushes, and willows as well as triticale fields.	**Not Likely to Occur (Nesting)/Moderate (Transient):** The nearest recorded occurrence is approximately 0.45 miles west of the BSA; however, the most recent occurrence was recorded over 20 years ago in 1997. This species could potentially forage in the BSA but there is no suitable nesting habitat. Not observed during reconnaissance surveys.
Athene cunicularia burrowing owl	**SSC**	Occurs in dry open grasslands, prairies, and low foothills. Highly tolerant of human activity and development including road shoulders, drainage sumps, and under portable buildings.	**High (Nesting)/High (Transient):** The nearest recorded occurrence is approximately 3.89 miles northwest of the BSA. Suitable nesting and foraging habitat for this species is present in the BSA. Not observed during reconnaissance surveys.
Buteo swainsoni Swainson's hawk	**ST, BCC**	Occurs in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	**Present (Transient):** The nearest recorded occurrence is approximately 5.17 miles northeast of the BSA. While this species could potentially forage in the BSA, there are limited potential nesting trees within a 0.5-mile radius of the BSA, and no nesting trees actually within the BSA. A single Swainson's hawk was incidentally observed flying overhead during protocol BNLL surveys.
Charadrius montanus mountain plover	**SSC**	Occurs in grasslands, cultivated fields, and foothill valleys.	**Moderate (Nesting)/Moderate (Transient):** The nearest recorded occurrence is approximately 4.7 miles northwest of the BSA; however, the most recent occurrence was recorded over 20 years ago in 1994. Suitable nesting and foraging habitat for this species is present in the BSA. Not observed during reconnaissance surveys.
Charadrius alexandrinus nivosus western snowy plover	**FT, SSC**	Occurs year-round in the San Joaquin Valley, where they breed on barren sparsely vegetated flats and along shores of alkaline and saline lakes, agricultural wastewater ponds, and salt evaporation ponds.	**Not Likely to Occur (Nesting)/Low (Transient):** The nearest recorded occurrence is 10 miles northeast of the BSA from 1978. This species could potentially forage in the BSA with low likelihood but there is no suitable nesting habitat. Not observed during reconnaissance surveys.

Table 4.4-7: Known and Potential Occurrences of Special-Status Wildlife within the BSA			
Species	**Status**	**Habitat Requirements**	**Potential to Occur**
Eremophila aplestris actia	**WL**	Occurs in coastal regions, chiefly from Sonoma County to San Diego County, and also a main part of San Joaquin Valley and east to the foothills. Prefers short-grass prairie, "bald" hills, mountain meadows, open coastal plains, fallow grain fields, and alkali flats.	**High (Nesting)/Present (Transient):** There are no recorded occurrences within 10 miles of the BSA. California horned larks were observed in the BSA during protocol BNLL surveys. Suitable nesting and foraging habitat for this species is present in the BSA.
Falco mexicanus prairie falcon	**WL**	Occurs in grasslands, savannahs, rangeland, some agricultural fields, and desert scrub. The known range is from southeastern deserts through Central Valley along the inner Coast Ranges and Sierra Nevada.	**Not Likely to Occur (Nesting)/Present (Transient):** The nearest recorded occurrence is within the BSA; this species was incidentally observed flying overhead during 2023 BNLL surveys. This species could potentially forage in the BSA but there is no suitable nesting habitat.
Gymnogyps californianus California condor	**FE**	Forages over large expanses of land including but not limited to, grasslands, foothills, and coastal mountain ranges. Nests on cliff faces, large trees, or man-made structures.	**Not Likely to Occur (Nesting)/Low (Transient):** There are no recorded occurrences within 10 miles of the BSA. This species could potentially forage in the BSA but there is no suitable nesting habitat. Not observed during reconnaissance surveys.
Lanius ludovicianus loggerhead shrike	**SSC**	Occurs in broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub, and washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	**High (Nesting)/Present (Transient):** There are no recorded occurrences within 10 miles of the BSA. Loggerhead shrikes were observed in the BSA during reconnaissance and protocol BNLL surveys. Suitable nesting and foraging habitat for this species is present in the BSA.
Toxostoma lecontei Le Conte's thrasher	**SSC**	Occurs in dry, sparsely vegetated deserts, grasslands, and foothills. Populations in California are known to occur in Fresno, Kern, and Kings Counties.	**High (Nesting)/High (Transient):** Le Conte's thrasher individuals have been recorded within the BSA; however, the occurrence was from 1948. Suitable nesting and foraging habitat for this species is present in the BSA. Not observed during reconnaissance surveys.
FISH			
Hypomesus transpacificus Delta smelt	**FT, ST**	Small fish, endemic to California only occurs in the San Francisco Estuary. The Delta smelt life cycle follows four seasons—spring spawning in fresh water, summer migration/rearing in the low salinity zone, fall maturation in the low salinity zone, and winter upstream migration shortly before spawning.	**Not Likely to Occur:** The BSA is outside of the range of the species and there is no suitable aquatic habitat in the BSA. No occurrences were recorded within 10 miles of the BSA. Not observed during reconnaissance surveys.

Table 4.4-7: Known and Potential Occurrences of Special-Status Wildlife within the BSA			
Species	**Status**	**Habitat Requirements**	**Potential to Occur**
INVERTEBRATES			
Branchinecta longiantenna longhorn fairy shrimp	**FE**	Occurs in clear, freshwater vernal pools, claypan pools, or freshwater depressions in sandstone in the Central Valley and around Soda Lake in San Luis Obispo County. There are only five known locations where this species occurs.	**Not Likely to Occur:** The nearest recorded occurrence is approximately 9.2 miles west of the BSA. No vernal pools occur within the BSA so it is unlikely that this species could occur. Not observed during reconnaissance surveys.
Branchinecta lynchi vernal pool fairy shrimp	**FT**	The species lives in a variety of vernal pool habitats and is currently found throughout California's Central Valley, the Central Coast, Southern California, and southern Oregon.	**Not Likely to Occur:** No occurrences were recorded within 10 miles of the BSA. No vernal pools occur within the BSA so it is unlikely that this species could occur. Not observed during reconnaissance surveys.
Bombus crotchii Crotch's bumble bee	**SCE**	Occurs from coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include *Antirrhinum*, *Phacelia*, *Clarkia*, *Dendromecon*, *Eschscholzia*, and *Eriogonum*.	**Moderate:** Suitable habitat is present because *Phacelia and Eriogonum* potential food plants occur within the BSA. The nearest recorded occurrence is approximately 6.7 miles southwest of the BSA from 1980; however, the most recent occurrence is from 1998, 7.5 miles southwest of the BSA. Not observed during reconnaissance surveys.
Danaus plexippus Monarch butterfly	**FC**	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts are located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby. Food plant genus *Asclepias*.	**Not Likely to Occur:** No suitable habitat for food or roosting occurs within the BSA. Not observed during reconnaissance surveys.
Protodufourea zavortinki Zavortink's protodufourea bee	**SSC**	Known host plants including members of *Phacelia* and *Emmenanthe*	**Low:** Suitable habitat is present because *Phacelia* potential host plants occur within the BSA. The nearest recorded occurrence is approximately 8 miles southwest of the BSA from 1970; however, the most recent occurrence is from 1993, 8.9 miles *southeast* of the BSA. Not observed during reconnaissance surveys.
MAMMALS			
Ammospermophilus nelsoni San Joaquin antelope squirrel	**ST**	Occurs in open grasslands but prefers areas that are lightly vegetated. Found in saltbush scrub lands mainly in the San Joaquin Valley.	**Present:** Suitable habitat for this species is present in the BSA. San Joaquin antelope squirrel individuals were observed within the BSA during the 2022 reconnaissance surveys and 2023 protocol BNLL surveys, with all observations occurring north of Lerdo Highway and most observations concentrated toward the northern end of the BSA. San Joaquin antelope squirrel was also observed in grasslands north of GP32 during 2022 protocol BNLL surveys conducted for a separate project (South Valley Biological Consulting 2022).

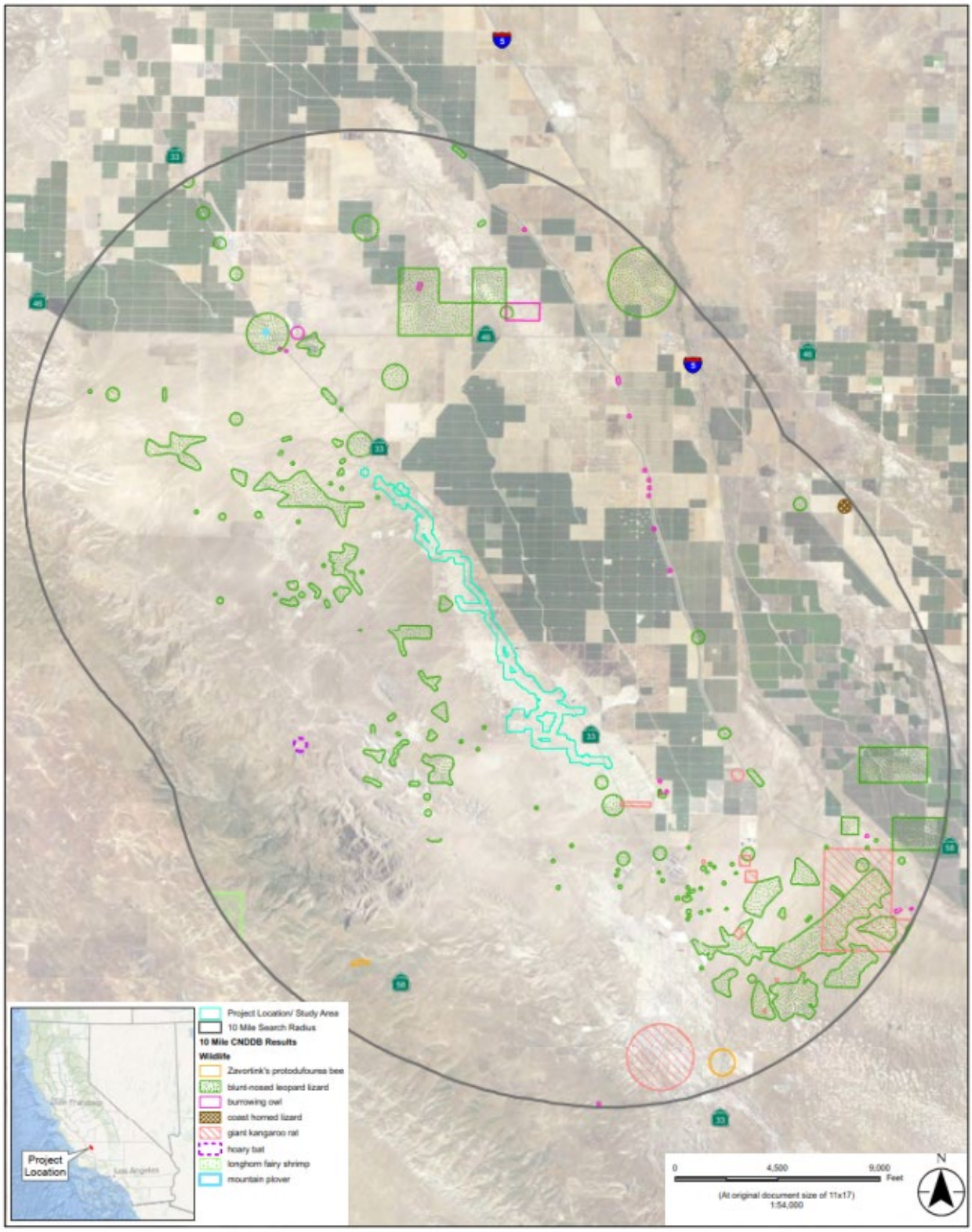
Table 4.4-7: Known and Potential Occurrences of Special-Status Wildlife within the BSA			
Species	**Status**	**Habitat Requirements**	**Potential to Occur**
Antrozous pallidus pallid bat	**SSC**	Occurs in a wide variety of habitats including grasslands, shrublands, woodlands, and forests. Roosts in open, dry habitats with rocky areas including caves, crevices, trees, buildings, and mines.	**Not Likely to Occur (Roosting)/Moderate (Transient):** The nearest recorded occurrence is approximately 6 miles west of the BSA; however, this occurrence was recorded well over 20 years ago in 1948. Suitable roosting habitat for this species is not present in the BSA. Not observed during reconnaissance surveys.
Dipodomys ingens giant kangaroo rat	**FE, SE**	Inhabits annual grasslands on the western side of the San Joaquin Valley, with marginal habitat in alkali scrub. Needs level terrain and sandy loam soils for burrowing.	**Low to Moderate:** The nearest recorded occurrence of giant kangaroo rat is approximately 1 mile southeast of the BSA from 2016 at Aera Energy's Block 12 property. Relatively dense annual grasslands and saltbush scrub in the BSA may support marginal habitat for the species. Not observed during reconnaissance surveys. Small mammal trapping is proposed to determine presence/absence.
Dipodomys nitratoides brevinasus short-nosed kangaroo rat	**SSC**	Occurs in lightly vegetated grasslands in the Central San Joaquin Valley of California, primarily in areas with sandy soils conducive to burrowing. Found exclusively west of the California Aqueduct.	**Moderate:** The nearest recorded occurrence is approximately 4 miles east of the BSA from 2007. Suitable habitat for this species is present in the BSA. Not observed during reconnaissance surveys.
Dipodomys nitratoides nitratoides Tipton kangaroo rat	**FE, SE**	Occurs in lightly vegetated grasslands in the Central San Joaquin Valley of California, primarily in areas with sandy soils conducive to burrowing. Found exclusively east of the California Aqueduct.	**Not Likely to Occur:** The nearest recorded occurrence is approximately 3.5 miles east of the BSA. BSA is outside the known range of the species that occurs east of the California Aqueduct. Not observed during reconnaissance surveys.
Eumops perotis californicus western mastiff bat	**SSC**	Occurs in open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, and chaparral. Roosts in crevices in cliff faces, high buildings, trees, and tunnels.	**Not Likely to Occur (Roosting)/Moderate (Transient):** The nearest recorded occurrence is approximately 2.6 miles east of the BSA; however, this occurrence was recorded well over 20 years ago in 1953. Suitable habitat for this species is not present in the BSA. Not observed during reconnaissance surveys.

Table 4.4-7: Known and Potential Occurrences of Special-Status Wildlife within the BSA			
Species	**Status**	**Habitat Requirements**	**Potential to Occur**
Lasiurus cinereus hoary bat	**SSC**	May be found at any location in California, although distribution is patchy in the southeastern deserts. This common, solitary species winters along the coast and in Southern California, breeding inland and north of the winter range. During migration, may be found at locations far from the normal range, such as the Channel Islands (Brown 1980) and the Farallon Islands (Tenaza 1966). Habitats suitable for bearing young include all woodlands and forests with medium to large-size trees and dense foliage	**Not Likely to Occur:** The nearest occurrence is 5.9 miles west of the BSA from 1947. Suitable habitat is not found within the BSA. Not observed during reconnaissance surveys.
Onychomys torridus tularensis Tulare grasshopper mouse	**SSC**	Occurs in grasslands in the Central San Joaquin Valley of California, primarily in areas with sandy soils conducive to burrowing.	**Moderate:** The nearest recorded occurrence is approximately 5.49 miles east of the BSA. Suitable habitat for this species is present in the BSA. Not observed during reconnaissance surveys.
Perognathus inornatus San Joaquin pocket mouse	**SSC**	Occurs in lightly vegetated grasslands in the Central San Joaquin Valley of California, primarily in areas with sandy soils conducive to burrowing.	**Moderate:** The nearest recorded occurrence is approximately 0.7 mile south of the BSA and the most recent occurrence is from 2003, 4.5 miles southeast of the BSA. Suitable habitat for this species is present in the BSA. Not observed during reconnaissance surveys.
Sorex ornatus relictus Buena Vista Lake ornate shrew	**FE, SSC**	Occurs in marshlands and riparian areas in the Tulare Basin. Prefers moist soil. Uses stumps, logs, and litter for cover.	**Not Likely to Occur:** No occurrences were recorded within 10 miles of the BSA. No suitable marshland or riparian habitat occurs within the BSA so it is unlikely that this species could occur. Not observed during reconnaissance surveys.
Taxidea taxus American badger	**SSC**	Uncommon, permanent resident found throughout most of the state, except in the northern North Coast area. Most abundant in drier open states of most shrub, forest, and herbaceous habitats, with friable soils.	**Moderate:** The nearest recorded occurrence is approximately 7.7 miles southeast from 1990. Suitable habitat exists in the BSA, and a few potential badger dens were observed in the BSA. No badgers were observed during reconnaissance surveys.
Vulpes macrotis mutica San Joaquin kit fox	**FE, ST**	Occurs in drier open stages of most shrub, forest, and herbaceous habitats. Needs a sufficient food supply, friable soils, and open, uncultivated ground. Highly tolerant of human activity and will opportunistically utilize man-made structures for cover and denning sites. Preys on burrowing rodents and discarded food trash.	**Present:** There are two occurrences from over 20 years ago. There are multiple occurrences within 10 miles of the BSA, including a 2007 occurrence located 2.9 miles southeast of the BSA. Suitable habitat for this species is present in the BSA. Several potential San Joaquin kit fox dens were observed during reconnaissance surveys in 2022 and protocol BNLL surveys in 2023. No San Joaquin kit foxes were observed during reconnaissance surveys, but the species is assumed to occur within the BSA.

Table 4.4-7: Known and Potential Occurrences of Special-Status Wildlife within the BSA			
Species	**Status**	**Habitat Requirements**	**Potential to Occur**
REPTILES			
Anniella pulchra northern California legless lizard	**SSC**	Occurs in coastal dunes, valley-foothill, chaparral, and coastal scrub. This is a secretive species that prefers sandy or loose organic soils.	**Low:** The nearest recorded occurrence is approximately 7.8 miles southwest of the BSA from 2015. Suitable habitat for this species is present in the BSA. Not observed during reconnaissance surveys.
Anniella alexanderae Temblor legless lizard	**SCE**	Endemic to the alkali desert scrub and annual grasslands of the southwestern San Joaquin Valley, east of the Temblor mountains at a 551-1,529-foot (168-466-meter) elevation.	**Low:** The nearest recorded occurrence is 8.8 miles southeast of the BSA from 2017. Suitable habitat for this species is present in the BSA. Not observed during reconnaissance surveys.
Arizona elegans occidentalis California glossy snake	**SSC**	Occurs in arid scrub, rocky washes, grasslands, and chaparral. Appear to prefer microhabitats of open areas with soil loose enough for easy burrowing.	**Moderate:** The nearest recorded occurrences are approximately 5.5 and 8.5 miles southeast of the BSA from 1932 and 2015. Suitable habitat for this species is present in the BSA. Not observed during reconnaissance surveys.
Emys marmorata western pond turtle	**SSC**	Occurs near permanent ponds, lakes, streams, irrigation ditches, or permanent pools along intermittent streams west of the Sierra-Cascade crest, except along the Mojave River.	**Not Likely to Occur:** The nearest recorded occurrence is approximately 4.9 and 8.9 miles east of the BSA. Suitable habitat for this species is not present in the BSA. Not observed during reconnaissance surveys.
Gambelia sila blunt-nosed leopard lizard	**FE, SE, FP**	Occurs mainly in the Carrizo Plain, Cuyama, Panoche, and the San Joaquin Valleys. Typically inhabits grasslands, saltbush scrub, and alkali sink scrub. Uses animal burrows for shelter.	**Present:** The nearest CNDDB occurrences are approximately 0.1 miles north and 7.2 miles southeast of the BSA from 1987 and 2020 respectively. Suitable habitat for this species is present in the BSA. Two BNLLs were observed in BNLL protocol survey Segment 4 and two BNLLs were observed in Segment 3 during the 2023 adult season protocol surveys; one adult male BNLL and one sub-adult (sex unknown) BNLL were observed in Segment 3 during the 2023 hatchling/sub-adult season protocol surveys (Appendix B; Mesa Biological 2023).
Masticophis flagellum ruddocki San Joaquin coachwhip	**SSC**	Occurs in grasslands with an understory of saltbush scrub and alkali sink scrub in areas with an abundance of small mammal burrows.	**Present:** The nearest recorded occurrences are approximately 3.1 miles southeast and 7 miles northeast of the BSA. Suitable habitat for this species is present in the BSA. A San Joaquin coachwhip was observed in the BSA during protocol BNLL surveys.
Phrynosoma blainvilli coast horned lizard	**SSC**	Occurs in valley, foothill hardwood, conifer, and riparian habitats, as well as in pine-cypress, juniper, and annual grassland habitats. Occurs in the Sierra Nevada foothills from Butte County to Kern County and throughout the central and Southern California coast.	**Moderate:** The nearest recorded occurrence is 9.3 miles northeast of the BSA from 2008. Suitable habitat for this species is present in the BSA. Not observed during reconnaissance surveys.

Table 4.4-7: Known and Potential Occurrences of Special-Status Wildlife within the BSA			
Species	**Status**	**Habitat Requirements**	**Potential to Occur**
Federal Rankings: FE = Federally Endangered FT = Federally Threatened FC= Federal Candidate for Listing BCC = USFWS Bird of Conservation Concern Key: BNLL = blunt-nosed leopard lizard BSA = biological study area CNDDB = California Natural Diversity Database			**State Rankings:** FP = Fully Protected SE= State Endangered ST = State Threatened WL = CDFW Watch List SCE = State Candidate for Listing as Endangered SSC = Species of Special Concern

Figure 4.4-8: Wildlife within 10 Mile Radius of BSA



Source: Stantec 2023

4.4.3 Regulatory Setting

Federal, State, regional, and local Biological Resource policies and regulations applicable to the proposed project are identified below.

Federal

Federal Endangered Species Act of 1973 (16 United States Code (U.S.C.) 1531 through 1543)

The Endangered Species Act (16 U.S. Code [U.S.C.] 1531 et seq.) was enacted to provide a means by which endangered and threatened species and the ecosystems on which they depend may be conserved. The Endangered Species Act and the implementing regulations (50 Code of Federal Regulations (CFR) 17.1 et seq.) include provisions for the protection and management of federally listed threatened or endangered plants and animals and their critical habitats. Generally, the USFWS regulates upland and freshwater species, and the National Marine Fisheries Service (NMFS) oversees provisions for the protection of anadromous, marine, and estuarine species. Section 4 of the Endangered Species Act requires the USFWS and/or NMFS to make determinations on whether any species should be listed as an endangered or threatened species and to designate critical habitat for endangered and threatened species (16 U.S.C. 1533). Critical habitat is defined in the Endangered Species Act as an area occupied by a listed species with physical or geographical/biological features essential to the species conservation or locations not currently occupied by listed species that are essential to the species conservation. 50 CFR 424.02 Section 9 of the Endangered Species Act (16 U.S.C. 1538, 50 CFR 17.21402 et seq.) prohibits the unauthorized take of any species that is listed as threatened or endangered under the Endangered Species Act. Take that is incidental to and not the purpose of the carrying out of otherwise lawful activities may be permitted under Section 7 and Section 10 of the Endangered Species Act.

Section 7 of the Endangered Species Act requires federal agencies to consult with the USFWS and/or NMFS and obtain a biological opinion before carrying out any federal program or agency action that may adversely affect threatened or endangered species. The Endangered Species Act Section 7 consultation process and biological opinion includes an evaluation of whether a federal project, including issuance of an incidental take permit (ITP) under Endangered Species Act Section 10, is likely to jeopardize the continued existence and recovery of any endangered or threatened species or result in the destruction or adverse modification of critical habitat designated for the species. If a proposed federal action would result in the take of a listed animal species or adverse modification of designated critical habitat, Section 7 of the Endangered Species Act requires the USFWS to provide an incidental take statement that includes reasonable and prudent measures and terms and conditions implementing those measures, to minimize the effects of such take. Compliance by the federal agency and any applicant with the incidental take statement exempts potential take or adverse critical habitat modification resulting from the proposed action from the prohibitions in Section 9 of the Endangered Species Act.

Section 9 lists actions that are prohibited under the Endangered Species Act. Although take of a listed species is prohibited, it is allowed when it is incidental to an otherwise legal activity.

Section 9 prohibits take of listed species of fish, wildlife, and plants without special exemption. The definition of "harm" includes significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns related to breeding, feeding, or shelter. "Harass" is defined as actions that create the likelihood of injury to listed species by significantly disrupting normal behavioral patterns related to breeding, feeding, and shelter.

Section 10 of the Endangered Species Act provides mechanisms for authorizing otherwise prohibited take through the ITP process for a proposed action that does not involve discretionary approval by a federal agency. Under Section 10(a) of the Endangered Species Act, an ITP can be obtained provided the permit applicant submits to the USFWS a habitat conservation plan (HCP; or a multiple species HCP when addressing more than one species) that satisfies Section 10(a)(2)(A) of the Endangered Species Act, and provided the USFWS determines that the HCP meets the issuance criteria of Section 10(a)(2)(B) of the Endangered Species Act. Section 10(a)(2)(B) of the Endangered Species Act requires the following criteria be met before the USFWS may issue an ITP: (1) the taking will be incidental; (2) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (3) the applicant will ensure that adequate funding for the HCP and procedures to deal with unforeseen circumstances will be provided; (4) the taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild; and (5) the applicant will ensure that other measures that the USFWS may require as necessary or appropriate will be provided.

The USFWS is required to annually identify species that are candidates for federal Endangered Species Act listing, including species that USFWS records indicate are subject to sufficient biological vulnerability and threats to support a proposal for listing, but for which a proposal has not been published due to other listing priorities. The list of candidate species is intended to: (1) notify the public that species face survival threats; (2) provide advance knowledge of potential listings for consideration by environmental planners and developers; (3) provide information that may stimulate and guide conservation efforts; (4) request additional input regarding candidate species; and (5) request information for setting listing priorities (Federal Register 79, No. 234 at 72451, December 5, 2014). The USFWS and other federal agencies, including the BLM, may also informally identify sensitive species or species of concern. These species are not subject to the Endangered Species Act or other federal statutory protection but they are considered by the USFWS and other agencies when evaluating the effects of a potential action or development resource management plans, including recovery plans under the Endangered Species Act.

Migratory Bird Treaty Act (16 U.S.C. 703 through 712)

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703–712) includes provisions for the protection of migratory birds and prohibits the non-permitted take of most migratory birds. Take under the MBTA is defined as to "pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any part, nest, or egg of any such bird, or any product, whether or not

manufactured" (16 U.S.C. 703(a)). Apart from certain limited exceptions, the USFWS has not implemented an ITP program for the MBTA.

Bald and Golden Eagle Protection Act (16 U.S.C. 668, enacted by 54 Stat. 250)

The Bald and Golden Eagle Protection Act (BGEPA) of 1940 prohibits any form of possession or take of bald eagles and golden eagles, including actions to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb" an eagle (16 U.S.C. 668c). To disturb a bald and golden eagle means "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: (1) injury to an eagle; (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (72 FR 31132; 50 CFR 22.3). A 1962 amendment created a specific exemption for possession of an eagle or eagle parts (for example, feathers) for Indian tribes' religious purposes.

Permits for the incidental, or unintentional, take of these species were first established on November 10, 2009, and then revised in December 2016 (USFWS 2016) and September 2022 (USFWS 2022) by the USFWS. The permit regulations authorize the limited take of these species associated with certain otherwise lawful activities, including take in the form of disturbance or actual physical take of eagles (50 CFR 22.26) and the removal of eagle nests (50 CFR 22.27). The regulations establish a hierarchy of take permits that could be issued for specific categories of activity to ensure that the total amount of authorized incidental take does not adversely affect the eagle populations in the western and eastern United States.

The 2016 revisions created a permitting framework for more efficient implementation. USFWS modified the definition of the BGEPA's "preservation standard," which requires that permitted take be compatible with the preservation of eagles. USFWS further removed the distinction between standard and programmatic permits, codifying standardized mitigation requirements, and extending the maximum permit duration for eagle ITPs (50 CFR 22.26). The regulations also include additional revisions to the eagle nest take regulations at 50 CFR 22.27, as well as revisions to the permit fee schedule at 50 CFR 13.11; new and revised definitions in 50 CFR 22.3; revisions to 50 CFR 22.25 (permits for golden eagle nest take for resource development and recovery operations) for consistency with the § 22.27 nest take permits; and two provisions that apply to all eagle permit types (50 CFR 22.4 and 22.11).

In September 2021, the USFWS published an Advance Notice of Proposed Rulemaking seeking input from Tribal governments, the public, and the regulated community on potential approaches for further expediting and simplifying the permit process authorizing incidental take of eagles. In September 2022, the USFWS published a proposed rule (2022) to consider revisions to regulations authorizing the issuance of permits for eagle incidental take and eagle nest take under the BGEPA (16 U.S.C. 668–668d). The purpose of these revisions is to increase the efficiency and effectiveness of permitting, facilitate and improve compliance, and increase the conservation benefit for eagles. The public comment period for the proposed rule was extended to December 29, 2022, and is currently under review following public comment (USFWS 2022).

The USFWS has indicated that, other than permits for religious and ceremonial activities, BGEPA take permits would generally not be available except for certain "programmatic" activities that may disturb or otherwise take eagles on an ongoing operational basis. To date, programmatic BGEPA permit guidance has been developed by the USFWS for wind and other renewable energy projects, including the development of avian protection plans and eagle conservation plans. Programmatic permits are not currently available for residential projects, and a very limited number of programmatic permits for renewable energy development have been issued by the USFWS.

Clean Water Act (33 U.S.C. §1251 et seq.)

The federal CWA was enacted to protect the nation's waters. Section 404 of the CWA authorizes the Secretary of the Army, acting through the USACE, to issue permits regulating the discharge of dredged or fill materials into "navigable waters at specified disposal sites." Waters of the United States (WOTUS) are defined in CFR, Title 33, Section 328.3, subdivision (a) to include navigable waters, perennial and intermittent streams, lakes, rivers, and ponds, as well as wetlands, marshes, and wet meadows. The CWA extends additional protection to certain sensitive aquatic habitats, including wetlands. Authorization to discharge dredge or fill materials into sensitive aquatic habitats requires that an applicant demonstrate the proposed activity represents the least environmentally damaging practicable alternative for the project. A proposed discharge into federally regulated wetlands must also not result in a net loss of wetland functions or values (USACE, DOD, and EPA 2008). All authorizations to discharge dredge or fill materials into WOTUS must demonstrate that the proposed projects have been designed to avoid, minimize, and mitigate all unavoidable effects on WOTUS.

The location and extent of WOTUS are formally identified by the USACE through a jurisdictional delineation process applying technical criteria described in various guidance documents issued by the USACE, including the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2 (USACE 2010), *A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* (Lichvar and McColley 2008), and in USACE Regulatory Guidance Letter No. 05-05 (USACE 2005).

The Section 404 permit program also applies to the dredge and fill of federal wetlands. Physically, a federal wetland must meet three specified criteria: (i) less permeable soils more likely to cause rainwater and other surface water flows to pond; (ii) seasonal ponding during specified types of rain events; and (iii) the presence of plants that are consistent with seasonal ponding. The extent to which a wetland area that meets the applicable criteria is federally jurisdictional, however, is subject to considerable legal uncertainty.

On December 30, 2022, the U.S. Environmental Protection Agency and Department of the Army (the agencies) announced a final rule founded upon the pre-2015 definition of WOTUS, updated to reflect consideration of Supreme Court decisions, the science, and the agencies' technical expertise. The rule restores fundamental protections so that the nation will be closer to achieving Congress' direction in the CWA that our waters be fishable and swimmable. It also ensures that our waters

support recreation and wildlife. In this rule, consistent with the general framework of the 1986 regulations, the agencies interpret WOTUS to include:

- Traditional navigable waters, the territorial seas, and interstate waters ("paragraph (a)(1) waters");
- Impoundments of "waters of the United States" ("paragraph (a)(2) impoundments");

  tributaries to traditional navigable waters, the territorial seas, interstate waters, or paragraph (a)(2) impoundments when the tributaries meet either the relatively permanent standard or the significant nexus standard ("jurisdictional tributaries");

- Wetlands adjacent to paragraph (a)(1) waters, wetlands adjacent to and with a continuous surface connection to relatively permanent paragraph (a)(2) impoundments, wetlands adjacent to tributaries that meet the relatively permanent standard, and wetlands adjacent to paragraph (a)(2) impoundments or jurisdictional tributaries when the wetlands meet the significant nexus standard ("jurisdictional adjacent wetlands"); and
- Intrastate lakes and ponds, streams, or wetlands not identified in paragraphs (a)(1) through (4) that meet either the relatively permanent standard or the significant nexus standard ("paragraph (a)(5) waters").

In addition, this rule codifies several exclusions from the definition of WOTUS, including long-standing exclusions for prior converted cropland and waste treatment systems, and for features that were generally considered non-jurisdictional under the pre-2015 regulatory regime (EPA 2023).

State

California Endangered Species Act (California Fish and Game Code §2050 et seq.)

The California Endangered Species Act (CESA) (CFGC 2050 et seq.) is intended to conserve, protect, restore, and enhance any State-protected endangered or threatened species and their habitats; and is implemented by the CDFW. The CESA prohibits the unauthorized take of species listed as threatened or endangered under the CESA. Take under State law is defined as actions to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" a State-listed species (CFGC Section 86). The CFGC authorizes the take of endangered, threatened, or candidate species through an ITP that may be issued by the CDFW under Section 2081. Alternatively, an incidental take of CESA-listed species may be authorized under Section 2080.1, which allows the CDFW to find that an ITP issued under the federal Endangered Species Act is consistent with CEQA State take permit requirements.

The CDFW also maintains lists of SSCs. An SSC designation is administrative in nature and does not create a formal legal status. The CDFW has indicated that SSC designations are intended to: (1) focus attention on at-risk animals identified by State, local, and federal entities; land managers; planners; consulting biologists; and others; (2) stimulate species research; and (3) stimulate conservation measures that would avoid a CESA listing.

California Fish and Game Code §1600-1616

Sections 1600 to 1616 of the CFGC states that it is unlawful to "substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of any river, stream, or lake" without first notifying CDFW of that activity. If CDFW determines and informs the project proponent that the activity would not substantially adversely affect any existing fish or wildlife resources, the activity may be undertaken without further permitting. If the CDFW determines that the proposed activity may substantially and adversely affect an existing fish or wildlife resource, a Lake or Streambed Alteration Agreement must be completed and approved by the CDFW, including reasonable measures necessary to protect the affected resources may be required prior to initiating the proposed activity (CFGC 1602).

State Waters (Water Code Section 13000 et seq.)

The Porter-Cologne Act provides the State and Regional Boards with the authority to regulate discharges of waste to wetlands or other waters of the State. Section 13050(e) of the Water Code defines waters of the State to mean "any surface water or groundwater, including saline waters, within the boundaries of the state." Discharges of waste have been construed to include fill, any material resulting from human activity, or any other discharge that may directly or indirectly impact waters of the State. All WOTUS in California are also waters of the State. Non-federal waters, including wetlands or waters that the USACE has delineated as isolated from federally regulated rivers or streams, are regulated by the State and Regional Boards under the Porter-Cologne Act. State jurisdiction over waters of the State is broader in scope than federal jurisdiction of WOTUS in California.

In general, the Porter-Cologne Act requires that all parties proposing a discharge that could affect waters of the State file a report of waste discharge with the applicable regional board. The regional board may either issue waste discharge requirements (WDRs), including conditions and measures to protect waters of the State in a public hearing, or may waive the issuance of WDRs with or without additional discharge conditions. As discussed above, Section 4012 of the federal CWA requires State agencies' certification that a proposed permit for the fill of a WOTUS complies with State water quality objectives. In some instances, the State definition of a water may be larger in size and/or broader in scope than the definition used for federal CWA delineation purposes. Most regional boards utilize the 401 certification process to determine whether additional WDRs may be required for impacts to waters of the State that are not addressed by a proposed federal fill permit. Discharges to waters of the State that are not federally regulated require compliance with the Porter-Cologne Act discharge notice and WDR issuance process. Many regional boards have adopted criteria for the issuance of WDRs that are similar to federal CWA Section 404 permit requirements, including the need to demonstrate a project has been designed to avoid, minimize, and mitigate for unavoidable effects on waters of the State and would not result in a net loss of wetlands.

The State Board is considering the adoption of a Wetland and Riparian Area Protection Policy in three phases (State Board Resolution No. 2008-0026) in three phases. Phase 1, the "Wetland Area Protection and Dredge and Fill Permitting Policy," is currently under review by the board and includes a proposed wetland definition, delineation methods, an assessment framework for collecting and reporting aquatic resource information, and requirements applicable to discharges of

dredged or fill material. A draft policy, draft regulation text, and CEQA analysis of the Phase 1 proposal remain pending.

California Fish and Game Code §§ 3503, 3503.5 and 3513 (Raptors and Migratory Birds)

Several provisions of the CFGC protect avian species, nests, and eggs. Section 3503 provides that it is unlawful "to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto." Section 3503.5 extends these statutory protections more specifically to raptors and birds of prey (Falconiformes or Strigiformes). The CDFW has not implemented ITP programs for Sections 3503 or 3503.5. Section 3513 makes it unlawful to "possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Treaty Act." As discussed above, apart from certain limited exceptions, the USFWS has not implemented an incidental take program for the MBTA.

Sections 3511, 4700, 5050, and 5515 of the CFGC prohibit the take or possession of certain birds, mammals, fish, and reptiles. These species are commonly referred to as "fully protected" under State law and State agencies are prohibited from permitting actions that would result in the incidental take of these species except under the auspices of an approved Natural Community Conservation Plan.

California Native Plant Protection Act of 1977; California Fish and Game Code §1900 et seq.

The Native Plant Protection Act of 1977 (CFGC 1900 et seq.) authorizes CDFW to designate rare and endangered native plants and provides specific protection measures for State-listed species.

CEQA Guidelines Section 15380

CEQA Guidelines Section 15380(b) provides that species not listed on the federal or State list of protected species may be considered rare or endangered if the species can be shown to be "endangered" or "rare" within the meaning of the statute. To be "endangered" means that the species' survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors. A species is "rare" when either: (1) although not presently threatened with extinction, the species exists in such small numbers throughout all or a significant portion of its range that it may become endangered if the environment worsens or (2) the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and not be considered "threatened" within the meaning of the Endangered Species Act.

Natural Community Conservation Planning Act (Fish and Game Code 2800 et seq.)

In 1991 California enacted the Natural Community Conservation Planning Act (CFGC Section 2800 et seq.) to authorize the creation and implementation of natural community conservation plans (NCCPs) to conserve natural communities at the ecosystem level while accommodating compatible land use. The act was revised in 2003 and has been subsequently amended. An NCCP is intended to function much like a federal HCP and provide for the long-term conservation of wildlife and plant communities in regional locations in a manner that also allows for economic development and growth. Section 2805(e) allows the incidental take of fully protected species that are covered under an approved NCCP.

Porter-Cologne Water Quality Control Act

The State Water Resources Control Board and RWQCBs regulate the discharge of waste to waters of the State. All projects proposing to discharge waste that could affect waters of the State must file a waste discharge report with the appropriate regional board. The board responds to the report by issuing WDRs or a waiver for that project discharge. Both the terms "discharge of waste" and "waters of the State" are broadly defined such that discharges of waste include fill, any material resulting from human activity, or any other "discharge." Isolated waters/wetlands within California, which are no longer considered WOTUS as defined by Section 404 of the CWA and limited by the Sackett decision, are addressed under the Porter-Cologne Act.

California Native Plant Society Rare Plant Program

The mission of the CNPS Rare Plant Program is to develop current, accurate information on the distribution, ecology, and conservation status of California's rare and endangered plants, and to use this information to promote science-based plant conservation in California. Once a species has been identified as a potential conservation concern, it is put through an extensive review process. Once a species has gone through the review process, information on all aspects of the species (for example, listing status, habitat, distribution, and threats) is entered into the online CNPS Inventory and given a CRPR. In 2011, the CNPS officially changed the name "CNPS List" to "CRPR." The Program currently recognizes more than 1,600 plant taxa (species, subspecies, and varieties) as rare or endangered in California.

Vascular plants listed as rare or endangered by the CNPS, but which might not have a designated status under State endangered species legislation, are defined by the following CRPR:

- CRPR 1A − Plants considered by the CNPS to be extinct in California
- CRPR 1B − Plants rare, threatened, or endangered in California and elsewhere
- CRPR 2 − Plants rare, threatened, or endangered in California, but more numerous elsewhere
- CRPR 3 − Plants about which we need more information – a review list
- CRPR 4 − Plants of limited distribution – a watch list

In addition to the CRPR designations above, the CNPS adds a Threat Rank as an extension onto the CRPR and designates the level of endangerment by a 1 to 3 ranking, with 1 being the most endangered and 3 being the least endangered and are described as follows:

- 0.3 – Seriously threatened in California (high degree/immediacy of threat)
- 0.2 – Fairly threatened in California (moderate degree/immediacy of threat)
- 0.3 – Not very threatened in California (low degree/immediacy of threats or no current threats known)

Regional and Local

Kern County General Plan

The project area is located within the Kern County General Plan (KCGP) area and, therefore, would be subject to applicable policies and measures of the KCGP. The Land Use, Conservation, and Open Space Element, the Noise Element, and the Energy Element of the KCGP include goals, policies, and implementation measures related to biological resources that apply to the project, as described below.

Chapter 1. Land Use, Conservation, and Open Space Element

1.3. Physical and Environmental Constraints

Policies

Policy 9. Construction of structures that impede water flow in a primary floodplain will be discouraged.

Policy 11. Protect and maintain watershed integrity within Kern County.

Implementation Measures

Implementation Measure I. Designated flood channels and water courses, such as creeks, gullies, and riverbeds, will be preserved as resource management areas or in the case of urban areas, as linear parks whenever practical.

1.9. Resource

Policies

Policy 11. Minimize the alteration of natural drainage areas. Require development plans to include necessary mitigation to stabilize runoff and silt deposition through the utilization of grading and flood protection ordinances.

Policy 20. Areas along rivers and streams will be conserved where feasible to enhance drainage, flood control, recreational, and other beneficial uses while acknowledging existing land use patterns.

1.10. General Provisions

1.10.5. Threatened and Endangered Species

Policies

Policy 27. Threatened or endangered plant and wildlife species should be protected in accordance with State and federal laws.

Policy 28. County should work closely with State and federal agencies to assure that discretionary projects avoid or minimize impacts to fish, wildlife, and botanical resources.

Policy 29. The County will seek cooperative efforts with local, State, and federal agencies to protect listed threatened and endangered plant and wildlife species through the use of conservation plans and other methods promoting management and conservation of habitat lands.

Policy 31. Under the provisions of the California Environmental Quality Act (CEQA), the County, as lead agency, will solicit comments from the California Department of Fish and Game and the USFWS when an environmental document (Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report) is prepared.

Policy 32. Riparian areas will be managed in accordance with United States Army Corps of Engineers, and the California Department of Fish and Game rules and regulations to enhance the drainage, flood control, biological, recreational, and other beneficial uses while acknowledging existing land use patterns.

Implementation Measures

Implementation Measure Q. Discretionary projects shall consider effects to biological resources as required by the California Environmental Quality Act.

Implementation Measure R. Consult and consider the comments from responsible and trustee wildlife agencies when reviewing a discretionary project subject to the California Environmental Quality Act.

Implementation Measure S. Pursue the development and implementation of conservation programs with State and federal wildlife agencies for property owners desiring streamlined endangered species mitigation programs.

1.10.6. Surface Water and Groundwater

Policies

Policy 44. Discretionary projects shall analyze watershed impacts and mitigate for construction-related and urban pollutants, as well as alterations of flow patterns and introduction of impervious surfaces as required by the California Environmental Quality Act (CEQA), to prevent the degradation of the watershed to the extent practical.

1.10.7. Light and Glare

Policies

Policy 47. Ensure that light and glare from discretionary new development projects are minimized in rural as well as urban areas.

Policy 48. Encourage the use of low-glare lighting to minimize nighttime glare effects on neighboring properties.

Implementation Measures

Implementation Measure AA. The County shall utilize CEQA Guidelines and the provisions of the Zoning Ordinance to minimize the impacts of light and glare on adjacent properties and in rural undeveloped areas.

Chapter 3. Noise Element

3.2. Noise Sensitive Areas

Policies

Policy 3. Encourage vegetation and landscaping along roadways and adjacent to other noise sources in order to increase absorption of noise.

Policy 4. Utilize good land use planning principles to reduce conflicts related to noise emissions.

Kern County Zoning Ordinance (Title 19 of the Ordinance Code of Kern County)

Chapter 19.98 Oil and Gas Production

The purpose of this chapter is to promote the economic recovery of oil, gas, and other hydrocarbon substances in a manner compatible with surrounding land uses and protection of public health and safety by establishing reasonable limitations, safeguards, and controls on exploration, drilling, and production of hydrocarbon resources. The procedures and standards contained in this chapter shall apply to all exploration drilling and production activities related to oil, gas, and other hydrocarbon substances carried out in unincorporated Kern County.

Section 19.98.050(I): Whenever oil or gas is produced into and shipped from tanks located on the premises, such tanks, whenever located within five hundred (500) feet of any dwelling or

commercial building, shall be surrounded by shrubs or trees, planted and maintained so as to develop attractive landscaping or shall be fenced in such a manner as to, insofar as practicable, screen such tanks from public view. Such fencing shall comply with the requirements of the California Division of Oil and Gas.

Section 19.98.050(K): Pumping wells shall be operated by electric motors or muffled internal combustion engines.

Section 19.98.050(L): The height of all pumping units shall not exceed thirty-five (35) feet and shall be painted and kept in neat condition.

Section 19.98.050(N): After production begins and a pump is installed on the wellhead, a fence at least six (6) feet in height shall be installed around the pump site or drilling island for public safety. This fence shall be constructed of chain link with wood or metal slats or other screening fence as may be approved by the Planning Director. This fencing and screening requirement shall apply only to those pump sites located within five hundred (500) feet of any dwelling. Such fencing shall comply with the requirements of the California Division of Oil and Gas.

Section 19.98.050(O): All required federal, State, and County rules and regulations shall be complied with at all times.

4.4.4 Impacts and Mitigation Measures

Methodology

The following impact analysis is based on existing and potential biological resources occurring within the project site and vicinity of the project identified through a literature review and database analysis. Biological resources evaluated included sensitive habitats, special-status plant and animal species, and potential for wildlife movement corridors. All State and federal data sources used for analysis focused on the California U.S. Geological Survey 7.5-minute quadrangles where the proposed project is primarily located and the 11 surrounding quads that include: Antelope Plain, Belridge, Emigrant Hill, Las Yeguas Ranch, Lokern, Lost Hills, Lost Hills NW, McKittrick Summit, Reward, Shale Point, and West Elk Hills. The potential for special-status species to occur on the project site is based on the results of database research, biological assessments, surveys conducted on the project site and vicinity, the presence of suitable habitat, and the proximity of the project site to previously recorded occurrences in the State and federal data sources used for analysis.

Reconnaissance surveys of the BSA were conducted to document the existing biological resources within the BSA over eight days, including March 15 through 17, May 9 through 12, and June 2, 2022. The reconnaissance-level surveys were performed within all habitat and terrain types present within the BSA. The primary goals of the habitat assessment and biological surveys were to identify habitat types within the BSA, assess habitats in terms of their suitability for supporting special-status wildlife or plant species, and document the presence or absence of any special-status species and other biological resources.

Tasks completed during the survey included developing an inventory of plant and wildlife species observed, characterizing vegetation associations and habitat conditions, assessing the potential for federally and State-listed special-status plant and wildlife species to occur, assessing the potential for bat usage habitat, and assessing the potential for migratory bird and raptor nesting within the BSA. All locational data were recorded using Esri Collector for ArcGIS software installed on an iPad, and site conditions were documented with representative photographs.

The following section describes potential impacts related to biological resources that could occur as a result of the project, and proposed mitigation measures.

The CEQA Guidelines define *direct impacts* as those impacts that result from a project and occur at the same time and place. *Indirect impacts* are caused by a project but can occur later in time or farther removed in distance while still reasonably foreseeable and related to the project. The potential impacts discussed in this analysis are those most likely to be associated with the construction and operation of the project. Construction impacts would include both direct and indirect impacts on biological resources. While direct impacts associated with the construction of the project are expected to occur only through the duration of construction activities, indirect construction impacts, such as the spread of non-native and invasive weeds, could potentially remain an ongoing source of disturbance. Operational impacts would also include both direct and indirect impacts on biological resources. Ongoing operations and maintenance impacts would occur during routine inspection and maintenance of the project facilities and would include such activities as routine inspections and emergency repairs. Operational impacts would remain an ongoing source of disturbance for many plants and wildlife species that occur within the facility perimeter and in adjacent habitats.

Project impacts are considered permanent if they involve the conversion of land to a new use, such as with the construction of new roads, well pad foundations, or operation and maintenance facilities. Temporary project impacts are those effects that do not result in the permanent land use conversion. Temporary effects to vegetation communities or other ground disturbance activities restricted solely to the construction phase, such as grading roads and clearing vegetation within staging areas, are considered temporary, provided that native vegetation is not replaced with infrastructure or the area is not maintained free of vegetation, and that restoration is completed.

The construction and operation of the project could impact plants and wildlife in a variety of ways. Construction activities could result in both direct and indirect impacts on species. Direct impacts as a result of construction activities associated with the installation of well pads and associated facilities would include temporary disturbance and/or loss of native vegetation communities utilized as habitat for both common and special-status wildlife and plants. Other impacts could include fugitive dust, lighting that may alter species behavior, and increased noise levels due to heavy equipment operations during construction. Increased interaction with humans, loss of burrows and dens during well pad preparation, trenching activities associated with flow/pipelines and steam lines, or entrapment during other activities associated with construction may cause increased harassment, injury and/or mortality of a species.

Direct impacts as a result of construction activities associated with the project could include:

- The permanent removal and/or temporary disturbance of native vegetation communities utilized as habitat for both common and special-status wildlife and plants, fugitive dust, and increased noise levels due to heavy equipment operations occurring in these areas.
- Excessive dust from construction activities can decrease the vigor and productivity of vegetation communities through effects on light penetration, photosynthesis, respiration, transpiration, increased penetration of phytotoxic gaseous pollutants, and increased incidence of pests and diseases.
- Noise and vibration associated with project activities may affect the behavior of wildlife in several ways. Excessive noise may affect species' behavior by causing nest or burrow abandonment and interfering with or altering normal behaviors.
- Lighting that may affect behavioral activities, physiology, population ecology, and ecosystems of both diurnal and nocturnal wildlife.
- Increased human activity in the BSA could affect essential behavioral activities and physiology of wildlife. Increased human activity could alter species behavior causing them to abandon nests or den sites. Abandonment (even temporary) of active nests or dens increases the risk to eggs, nestlings, fledglings, and other dependent young. Flushing animals from nests, dens, and other refuges also increases their risk of injury or mortality from collisions with construction equipment and other vehicles, as well as predation.
- An increase in non-native and invasive species could potentially increase and remain an ongoing source of disturbance. Impacts could include the loss of habitat due to the establishment of non-native and invasive weeds.
- An increase in mortality, injury, or displacement of special-status plants or wildlife, loss or degradation of native habitat, or interference with wildlife movement or migration may also occur.

Indirect impacts on habitat could include alterations to existing topographical and hydrological conditions, increased erosion and sediment transport, and the establishment of non-native and invasive weeds. Operational impacts include disturbance due to increased human presence, risk of injury or mortality from maintenance vehicles on access roads, and further opportunities for the introduction and spread of non-native and invasive weeds. More specifically, indirect impacts as a result of construction activities associated with the project could include:

- The removal of vegetation can result in indirect effects on biological resources from the permanent loss of habitat. Loss or degradation of habitat including damage to shrubs and plants could alter access to a variety of essential resources, including shade and food sources.
- Indirect impacts on habitat could include alterations to existing topographical and hydrological conditions, increased erosion and sediment transport, and the establishment of non-native and invasive weeds.

- Indirect effects caused by disturbance-type impacts, such as construction activity near an active nest or primary foraging area, also have the potential to impact raptor species.
- Indirect impacts attributed to the colonization of non-native weeds could include a gradual decrease in natural biodiversity as non-native weed infestations may extirpate native plant populations.

Operational impacts could also include mortality, injury, or displacement of special-status plants or wildlife; loss or degradation of native habitat; interference with wildlife movement or migration; disturbance to plants, animals, and habitat from noise, light, or dust; and disturbance due to increased human presence; risk of injury or mortality from maintenance vehicles on access roads; and further opportunities for the introduction and spread of non-native and invasive weeds.

Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would normally be considered to have a significant impact if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations or by the CDFW or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- Conflict with the provisions of an adopted HCP, NCCP, or other approved local, regional, or state HCP.

Project Impacts

Impact 4.4-1: Have a Substantial Adverse Effect, either Directly or through Habitat Modifications, on Any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations or by the California Department of Fish and Wildlife or United States Fish and Wildlife Service

The proposed project would require ground disturbance during construction of the project including cut and fill volumes of approximately 208,000 cubic yards.

As discussed below, the County would require mandatory minimum mitigation for any new land disturbance associated with activities in the project area.

New land disturbance in locations occupied by special-status plants and wildlife could result in both direct and indirect impacts on such species. New land disturbance outside of actively disturbed areas could reduce the amount of available habitat for one or more special-status species within the project area. Degradation of habitat including damage to shrubs and plants could alter access to a variety of essential resources, including shade and food sources. In addition, construction activities could result in the displacement and/or potential mortality of resident wildlife species that are poor dispersers such as snakes, lizards, and small mammals. Construction activities would most likely be most adverse to **ground-dwelling or fossorial animals** (i.e., animals that live in nests, dens, burrows, or substrate below ground). Animals such as foraging and nesting Crotch's bumble bee, reptiles, small mammals, burrowing owl, San Joaquin antelope squirrel (SJAS), and American badger have the potential to be injured or killed while above-ground or while occupying dens/burrows from heavy equipment used during construction activities, including during new pipeline construction, well drilling, utility line construction, trenching, excavation of foundations for project features, construction of utility line towers, and construction of other project facilities. Impacts could include the crushing of individuals and the crushing or collapse of burrows by construction vehicles and during construction work. Such animals could also fall into excavated areas (for example, pipeline trenching, and bore pits) and become trapped, which could result in mortality or injury. Additionally, if left unimpeded, individuals who could move through the work areas and across access roads could be at risk of injury or mortality from foot and vehicle traffic. Direct effects on wildlife, including injury or mortality, may could also result from regrading dirt roads with heavy equipment, and maintaining paved roads with paving equipment if wildlife were to enter construction areas or be near where this work is being carried out.

Construction activities could also directly impact **ground-nesting birds or birds that nest in shrubs**. Clearing/grubbing could directly impact active bird nests if these activities are conducted during the nesting season, resulting in potential damage or destruction to nests, eggs, and/or young.

Direct effects on special-status wildlife could also result from increased equipment and human presence, including construction-related disturbance and ground vibration during excavation, trenching, pipeline installation, and related activities. Construction noise, disturbance, and ground vibration could cause the collapse of burrows and may deter wildlife from inhabiting or foraging in areas near construction activities. Therefore, foraging and other above-ground behaviors could be disrupted, and exposure to predators and competition with other animals for resources could result from displacement behavior as wildlife migrates to other areas without construction disturbance.

Project construction activities would temporarily reduce vegetation in areas where vegetation trimming or removal is needed and may temporarily increase airborne dust that may settle on vegetation surrounding construction areas within the BSA. The dust from construction activity may temporarily degrade the overall quality of the local vegetation communities in the BSA.

Additionally, heavy equipment working in the BSA may disrupt or compact soils in localized areas and make some habitats less suitable for digging burrows by mammals for a period of time. Certain biotic crusts and other developed soil profiles may be affected by construction activities and would potentially reduce soil viability for special-status plants and animals. These indirect effects may diminish the suitability of habitat near construction areas for special-status wildlife for a period of time following construction while vegetation regenerates, rainstorms remove dust from vegetation, and burrows are re-established.

Noise disturbance could also have the potential to alter the foraging and/or dispersal/migration behaviors of species such as SJAS and the nesting behaviors of various bird species. However, these indirect impacts would be temporary and localized, and are not expected to translate into adverse effects on special-status wildlife because most locations within the project site and beyond would not be subjected to these indirect effects.

Special-Status Plants

The presence of special-status plant species is summarized in Section 4.4.2, *Environmental Setting.* Direct impacts from construction activities could include the destruction or injury of individual plants, if present. During the growth and blooming period, the spread of dust during construction could have an indirect impact on the species, as could the spread of non-native or invasive species caused by project activities. Competition with invasive plants would have an indirect impact on these species.

Mitigation Measures (MM) 4.4-1 through MM 4.4-3, MM 4.4-16, MM 4.4-17, MM 4.4-19, MM 4.4-20, and MM 4.4-21 have been identified to reduce construction impacts to special-status plant species to less than significant. No impacts to special-status plant species are anticipated to occur during the operational phase of the project.

Special-Status Wildlife

The presence of special-status wildlife species with the potential to occur in the vicinity of the project is discussed in Section 4.4.2, *Environmental Setting,* and is summarized below:

Western Spadefoot

The western spadefoot was not observed during reconnaissance surveys. However, the BSA is within the known range for suitable upland habitat for the species. Direct impacts on this species could include the destruction of active nests resulting from project construction activities. Noise, vibration, and increased human activity could alter normal behaviors resulting in nest failure, reducing foraging success, and displacing individuals from established territories. Loss of suitable habitat could impact the species. The project could also result in the loss of suitable habitat. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts to the species.

Tricolored Blackbird

The tricolored blackbird was not observed during reconnaissance surveys. Although there is no suitable nesting habitat within the BSA, the BSA does include a habitat for the species to potentially forage. Direct impacts on this species could include the destruction of active nests resulting from project construction activities. Noise, vibration, and increased human activity could alter normal behaviors resulting in nest failure, reducing foraging success, and displacing individuals from established territories. Loss of suitable habitat could impact the species. The project could also result in the loss of suitable habitat. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-14, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts to the species.

Burrowing Owl

The burrowing owl was not observed during reconnaissance surveys. Suitable nesting and foraging habitat for this species is present in the BSA. Direct and/or indirect impacts on burrowing owls could occur if there is an active burrow within the BSA during the period of construction activities. Construction activities could result in crushing or destroying a burrow, with or without a burrowing

owl inside. Noise, vibration, and increased human activity resulting from project construction activities could alter the daily behaviors of individual owls and affect foraging success, displace owls from their burrows, or lead to nest failure. Operational activities have the potential to impact burrowing owls in the same way but to a lesser degree than construction activities. Suitable nesting and foraging habitat would be lost as a result of the project. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-4, MM 4.4-14, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts to the species.

Swainson's Hawk

A single Swanson's hawk was observed flying overhead during reconnaissance surveys. The BSA is within the known range for the species and suitable habitat for foraging is present. Although there are no nesting trees within the BSA, there are limited potential nesting trees within a 0.5-mile radius of the BSA. Direct impacts on Swainson's hawks could occur if construction activities occur near an active nest or in a foraging habitat during the nesting season. Complete tree removal, noise, and vibration from the construction of the project, plus the presence of construction workers, could alter the normal behaviors of nesting adults, resulting in harm or death to eggs or nestlings. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-13, MM 4.4-14, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

Mountain Plover

The mountain plover was not observed during reconnaissance surveys. The BSA is within the known range for the species and suitable habitat for nesting foraging is present. Direct impacts on the mountain plover could occur if construction activities occur near an active nest or in a foraging habitat during the nesting season. Complete tree removal, noise, and vibration from the construction of the project, plus the presence of construction workers, could alter the normal behaviors of nesting adults, resulting in harm or death to eggs or nestlings. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-14, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

Western Snowy Plover

The western snowy plover was not observed during reconnaissance surveys. Although there is no suitable nesting habitat within the BSA, the BSA does include a habitat for the species to potentially forage. Direct impacts on this species could include altered behaviors due to noise, vibration, and increased human activity resulting in nest failure, reducing foraging success, and displacing individuals from established territories. Loss of suitable habitat could impact the species. The project could also result in the loss of suitable habitat. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-14, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

Horned Lark

The horned lark was observed throughout the BSA during reconnaissance surveys. Suitable nesting and foraging habitat for this species is present within the BSA. Direct impacts on this species could include the destruction of active nests resulting from project construction activities. Noise, vibration, and increased human activity could alter normal behaviors resulting in nest failure, reduced foraging success, and displacement of individuals from established territories. Loss of

suitable habitat could impact the species. The project could also result in the loss of suitable habitat. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-14, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

Prairie Falcon

The prairie falcon was observed flying overhead during reconnaissance surveys. Although there is no suitable nesting habitat within the BSA, the BSA does include a habitat for the species to potentially forage. Direct impacts on the prairie falcon could include mortality or injury caused by project construction activities. Noise, vibration, and increased human activity could alter normal behaviors resulting in reduced foraging success and displacing individuals from established territories. Loss of suitable habitat could impact the species. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-14, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

California Condor

The California condor was not observed during reconnaissance surveys. Although there is no suitable nesting habitat within the BSA, the BSA does include a habitat for the species to potentially forage. Direct impacts on this species could include altered behaviors due to noise, vibration, and increased human activity resulting in nest failure, reducing foraging success, and displacing individuals from established territories. Loss of suitable habitat could impact the species. The project could also result in the loss of suitable habitat. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-14, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

Loggerhead Shrike

Multiple loggerhead strike observations were made throughout the BSA during reconnaissance surveys. Suitable nesting and foraging habitat for this species is present within the BSA. Direct impacts on this species could include the destruction of active nests resulting from project construction activities. Noise, vibration, and increased human activity could alter normal behaviors resulting in nest failure, reducing foraging success, and displacing individuals from established territories. Loss of suitable habitat could impact the species. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-14, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

Le Conte’s Thrasher

The Le Conte’s thrasher was not observed during reconnaissance surveys. However, suitable nesting and foraging for this species is present within the BSA. Direct impacts on this species could include the destruction of active nests resulting from project construction activities. Noise, vibration, and increased human activity could alter normal behaviors resulting in nest failure, reducing foraging success, and displacing individuals from established territories. Loss of suitable habitat could impact the species. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-14, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

Delta Smelt, Longhorn Fairy Shrimp, and Vernal Pool Fairy Shrimp

The Delta smelt, longhorn fairy shrimp, and vernal pool fairy shrimp were not observed during reconnaissance surveys. The BSA is outside of the range of these species to occur as there is no suitable aquatic habitat in the BSA. No project-related impacts would occur to the species.

Crotch's Bumble Bee

The Crotch's bumblebee was not observed during reconnaissance surveys. However, the BSA is within the known range for the species and suitable habitat is present. Direct impacts on Crotch's bumblebee could include mortality or injury caused by project construction activities. The project could also result in the loss of suitable habitat. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-5, MM 4.4-6, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

Monarch Butterfly

The monarch butterfly was not observed during reconnaissance surveys. Known suitable habitat for food or roosting was also not observed. However, direct impacts on the species could include mortality or injury caused by project construction activities. The project could also result in the loss of suitable habitat. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

Zavortink's Protodufourea Bee

The Zavortink's protodufourea bee was not observed during reconnaissance surveys. However potential host plants of the species (*Phacelia*) were observed within the BSA. Direct impacts on the species could include mortality or injury caused by project construction activities. The project could also result in the loss of suitable habitat. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

San Joaquin Antelope Squirrel

Multiple SJAS observations were made throughout the BSA during reconnaissance surveys. Suitable habitat for this species containing suitable burrows is present within the BSA. Direct impacts on this species could include mortality or injury caused by entrapment or crushing individuals within burrows or from vehicle strikes during construction. Indirect impacts caused by noise, vibration, and the presence of construction workers could alter the normal behaviors of SJAS, which could affect reproductive success, foraging success, or displacement from active burrows. Loss of foraging habitat could impact the species. Loss of suitable habitat could cause indirect impacts on the species, but impacts would be minimal given the amount of suitable foraging habitat throughout the region. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-10, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts to the species.

Pallid Bat

The pallid bat was not observed during reconnaissance surveys. Known suitable habitat for roosting was also not observed. However, direct impacts on the species could include mortality or injury

caused by project construction activities. The project could also result in the loss of suitable habitat. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-5, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts to the species.

Giant Kangaroo Rat

The giant kangaroo rat was not observed during reconnaissance surveys. However, the BSA is within the known range of the species and suitable habitat is present. Direct impacts on this species could include mortality or injury caused by entrapment or crushing individuals within burrows or from vehicle strikes during construction. Indirect impacts caused by noise, vibration, and the presence of construction workers could alter the normal behaviors of the giant kangaroo rat, which could affect reproductive success, foraging success, or displacement from active burrows. Loss of foraging habitat could impact the species. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-9, MM 4.4-17, MM 4.4-18, and MM 4.4-19, listed below, would reduce impacts on the species.

Short-Nosed Kangaroo Rat

The short-nosed kangaroo rat was not observed during reconnaissance surveys. However, the BSA is within the known range of the species and suitable habitat is present. Direct impacts to this species could include mortality or injury caused by entrapment or crushing individuals within burrows or from vehicle strikes during construction. Indirect impacts caused by noise, vibration, and the presence of construction workers could alter the normal behaviors of the giant kangaroo rat, which could affect reproductive success, foraging success, or displacement from active burrows. Loss of foraging habitat could impact the species. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-9, MM 4.4-17, MM 4.4-18, and MM 4.4-19, listed below, would reduce impacts on the species.

Tipton Kangaroo Rat

The Tipton kangaroo rat was not observed during reconnaissance surveys and the BSA is outside of the known range of the species. However, direct impacts on this species could include mortality or injury caused by entrapment or crushing individuals within burrows or from vehicle strikes during construction. Indirect impacts caused by noise, vibration, and the presence of construction workers could alter the normal behaviors of the giant kangaroo rat, which could affect reproductive success, foraging success, or displacement from active burrows. Loss of foraging habitat could impact the species. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-9, MM 4.4-17, MM 4.4-18, and MM 4.4-19, listed below, would reduce impacts on the species.

Western Mastiff Bat

The western mastiff bat was not observed during reconnaissance surveys and suitable habitat for this species is not present in the BSA. However, direct impacts on this species could include mortality or injury caused by entrapment or crushing individuals within burrows or from vehicle strikes during construction. Indirect impacts caused by noise, vibration, and the presence of construction workers could alter the normal behaviors of the giant kangaroo rat, which could affect reproductive success, foraging success, or displacement from active burrows. Loss of foraging

habitat could impact the species. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-5, MM MM 4.4-17, MM 4.4-18, and MM 4.4-19, listed below, would reduce impacts on the species.

Hoary Bat

The hoary bat was not observed during reconnaissance surveys and suitable habitat for this species is not present in the BSA. However, direct impacts on this species could include mortality or injury caused by entrapment or crushing individuals within burrows or from vehicle strikes during construction. Indirect impacts caused by noise, vibration, and the presence of construction workers could alter the normal behaviors of the giant kangaroo rat, which could affect reproductive success, foraging success, or displacement from active burrows. Loss of foraging habitat could impact the species. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-5, MM 4.4-17, MM 4.4-18, and MM 4.4-19, listed below, would reduce impacts on the species.

Tulare Grasshopper Mouse

The Tulare grasshopper mouse was not observed during reconnaissance surveys. However, the BSA is within the known range of the species and suitable habitat is present. Direct impacts on this species could include mortality or injury caused by entrapment or crushing individuals within burrows or from vehicle strikes during construction. Indirect impacts caused by noise, vibration, and the presence of construction workers could alter the normal behaviors of Tulare grasshopper mouse, which could affect reproductive success, foraging success, or displacement from active burrows. Loss of foraging habitat could impact the species. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-17, MM 4.4-18, and MM 4.4-19, listed below, would reduce impacts on the species.

San Joaquin Pocket Mouse

The San Joaquin pocket mouse was not observed during reconnaissance surveys. However, the BSA is within the known range of the species and suitable habitat is present. Direct impacts on this species could include mortality or injury caused by entrapment or crushing individuals within burrows or from vehicle strikes during construction. Indirect impacts caused by noise, vibration, and the presence of construction workers could alter the normal behaviors of the species, which could affect reproductive success, foraging success, or displacement from active burrows. Loss of foraging habitat could impact the species. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-17, MM 4.4-18, and MM 4.4-19, listed below, would reduce impacts on the species.

Buena Vista Lake Ornate Shrew

The Buena Vista Lake ornate shrew was not observed during reconnaissance surveys. Known suitable habitat was also not observed. However, direct impacts on the species could include mortality or injury caused by entrapment or crushing individuals within burrows or from vehicle strikes during construction. Indirect impacts caused by noise, vibration, and the presence of construction workers could alter the normal behaviors of the species, which could affect reproductive success, foraging success, or displacement from active burrows. Loss of foraging habitat could impact the species. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-17, MM 4.4-18, and MM 4.4-19, listed below, would reduce impacts on the species.

American Badger

The American badger was not observed during reconnaissance surveys. However, suitable denning and foraging habitast are present within the BSA, and potentially suitable dens and signs of badger were observed during surveys. Direct impacts on this species could include mortality or injury caused by entrapment or crushing individuals within dens and vehicle strikes. Indirect impacts to the species could be caused by noise, vibration, and the presence of construction workers that could alter normal behaviors, which could affect reproductive success, foraging success, or displacement from active dens if they were present within or adjacent to the BSA during construction. Operational activities could impact the species in many of these same ways because it is assumed that this species could be present from time to time during the operational phase of the project. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-12, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on this species.

San Joaquin Kit Fox

No San Joaquin kit foxes were observed during reconnaissance surveys. However, suitable dens were observed throughout the BSA and the species is assumed to occur within the BSA. San Joaquin kit fox dens were observed in a variety of areas, such as rights of way and vacant lands. Joaquin kit fox may be attracted to the BSA because of the type and level of ground-disturbing activities and the loose, friable soils resulting from intensive ground disturbance. Since this species is highly mobile, foxes could be injured or killed if they disperse through the BSA during construction or operations activities. Direct impacts could also include entrapment in trenches or pipes during construction. If there is an active den within the project footprint during construction activities, noise and vibration from construction activities could alter the daily behaviors of individuals and affect foraging activity, or dens could be subject to collapse. Mortalities from vehicle strikes are possible but the proposed project would not cause an appreciable increase in traffic at night when the species is most active. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-11, MM 4.4-17, MM 4.4-18, and MM 4.4-19, listed below, would avoid direct impacts on the species.

Northern California Legless Lizard

The Northern California legless lizard was not observed during reconnaissance surveys. However, the BSA is within the known range for the species and suitable habitat is present. Direct impacts on the species could include mortality or injury caused by project construction activities. Noise, vibration, and increased human activity could alter the normal behaviors of the lizard. The project could also result in the loss of suitable habitat. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-8, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

Temblor Legless Lizard

The Temblor legless lizard was not observed during reconnaissance surveys. However, the BSA is within the known range for the species and suitable habitat is present. Direct impacts on the species could include mortality or injury caused by project construction activities. Noise, vibration, and increased human activity could alter the normal behaviors of the lizard. The project could also

result in the loss of suitable habitat. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-7, MM 4.4-8, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

California Glossy Snake

The California glossy snake was not observed during reconnaissance surveys. However, the BSA is within the known range for the species and suitable habitat is present. This species is nocturnal, so the impacts of construction activities are expected to be limited. Direct impacts on California glossy snake could include mortality or injury caused by project construction activities. Noise, vibration, and increased human activity could alter the normal behaviors of the snake. The project could also result in the loss of suitable habitat. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-8, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

Western Pond Turtle

The western pond turtle was not observed during reconnaissance surveys. Known suitable habitat for this species was also not observed. However, direct impacts on the species could include mortality or injury caused by project construction activities. The project could also result in the loss of suitable habitat. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-8, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

Blunt-Nosed Leopard Lizard

Multiple BNLL observations were made throughout the BSA during reconnaissance surveys. Suitable habitat for this species is also present within the BSA. Direct impacts on the species could include mortality or injury caused by project construction activities. Noise, vibration, and increased human activity could alter the normal behaviors of the lizard. The project could also result in the loss of suitable habitat. Implementation MM 4.4-1 through MM 4.4-3, MM 4.4-8, MM 4.4-15, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

San Joaquin Coachwhip

The San Joaquin coachwhip was observed within the BSA during reconnaissance surveys. Suitable habitat for this species is also present within the BSA. Direct impacts on the species could include mortality or injury caused by project construction activities. Noise, vibration, and increased human activity could alter the normal behaviors of the lizard. The project could also result in the loss of suitable habitat. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-8, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

Coast Horned Lizard

The coast horned lizard was not observed during reconnaissance surveys. However, the BSA is within the known range for the species and suitable habitat is present. Direct impacts on the species could include mortality or injury caused by project construction activities. Noise, vibration, and increased human activity could alter the normal behaviors of the lizard. The project could also result in the loss of suitable habitat. Implementation of MM 4.4-1 through MM 4.4-3, MM 4.4-8, MM 4.4-17, MM 4.4-18, and MM 4.4-19 would reduce impacts on the species.

Mitigation Measures

Avoidance and minimization measures are designed to reduce or eliminate impacts on special-status species through project construction, operation, and decommissioning. Detailed specific measures are outlined below for each special-status species that may occur on the project site.

MM 4.4-1 The following are requirements for all grading and construction activities on all project components in the defined disturbance area, including all injection wells, abandonment of wells, capture facilities and pipelines. The remaining carbon capture and storage (CCS) Surface Land Area that is within the project boundary but has no construction or disturbance is not subject to this requirement.

a. **Qualifications:** The owner/operator shall use a qualified biologist for all work on reports submitted for any application for project permit. The qualified biologist must have a Bachelor of Science Degree or Bachelor of Arts Degree in biology or related environmental science, have demonstrated familiarity with the natural history, habitat affinities and identification of Covered Species of the San Joaquin Valley and have conducted work in California for at least one (1) year of field level reconnaissance survey work in the San Joaquin Valley. The resume of the biologist preparing any report submitted for permits shall be included in the report. Lack of these specific qualifications will result in immediate rejection of the report without further review.

b. **Protocol Surveys:** Based on the information gathered from the biological reconnaissance survey and any informal consultation with United States Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW), any required focused/protocol surveys shall be conducted by a qualified biologist consistent with protocol study timelines in advance of submittal of the permit application to determine the presence/absence of sensitive species protected by State and federal Endangered Species Acts and potential project impacts to those species.

   The survey shall be conducted in accordance with the most current standard protocol of the USFWS and California Department of Fish and Wildlife. The purpose of focused/protocol surveys is to confirm the presence or absence of any species listed as threatened or endangered under the federal Endangered Species Act. Threatened or endangered under the California Endangered Species Act, rare or endangered in the California Native Plant Protection Act or designated as fully protected in the California Fish and Game Code (collectively, “Protected Species”), and to confirm the presence or absence of any other species considered “sensitive” under California Environmental Quality Act (“Sensitive Species”), and to identify and implement avoidance and minimization measures for such species. The surveys shall be conducted in accordance

with all currently applicable presence and absence survey and/or species protocols established by the USFWS and the CDFW ("Species Protocols"). In the absence of any approved protocols, the survey shall extend for a minimum of 250 feet from all areas where any ground disturbance activities would occur, provided that permission to access has been obtained.

As an alternative to individual pre-disturbance surveys for each application, and after consultation with and concurrence by the CDFW and the USFWS, multiple parcels or areas of CCS activities (including lands which may have multiple surface or mineral ownership) may be consolidated for the purpose of more efficiently managing pre-disturbance surveys and determinations regarding the absence of protected species in areas of proposed new ground disturbance activities.

c. **Monitoring:** A biological monitor with the same qualifications as a qualified biologist shall be present during ground-disturbing activities in project locations that have special-status species habitat or are adjacent to potential special-status species habitat. Within 30 days before any ground-disturbing activities in special-status species habitat, the qualified biologist shall conduct a pre-disturbance survey to record existing conditions of the site, determine if conditions have changed since the reconnaissance or focused/protocol surveys were conducted, and to determine where sensitive species avoidance buffers will be established.

MM 4.4-2 **Take Authorization**: No incidental take of any species listed as threatened or endangered under the federal Endangered Species Act, threatened or endangered under the California Endangered Species Act, rare or endangered in the California Native Plant Protection Act, or designated as fully protected in the California Fish and Game Code (Protected Species) may occur unless the incidental take is authorized by applicable State and federal wildlife agencies in the **form of a permit or other written authorization**, an approved State or federal conservation plan, or in accordance with an approved regional plan such as the Draft Valley Floor Habitat Conservation Plan and/or Natural Community Conservation Plan.

MM 4.4-3 **Buffers:** Protective buffers shall be used, where effective in the opinion of the qualified biologist, to avoid any unauthorized incidental take of Protected Species, and to minimize any incidental take of Sensitive Species, by separating the planned disturbance area from any locations where the qualified biologist has detected the presence of Protected Species or Sensitive Species. Protective buffers, as shown in Table 4.4-8, shall be delineated using brightly colored stakes and/or flagging or similar materials and remain until construction activities are complete, at which time of completion the buffers must be removed. Protective buffers shall be established around active dens and/or burrows of special-status animal species, or populations of special-status plant species to avoid unauthorized take of protected species as listed in Table 4.4-8. The protective buffer distance shall be increased

if required to avoid unauthorized incidental take of any Protected Species as determined by a qualified biologist. Protective buffer distances and other avoidance measures that may be implemented to avoid impacts to Protected Species or Sensitive Species must be consistent with the USFWS and/or the CDFW and shall be implemented and overseen by the qualified biologist.

Table 4.4-8: Disturbance Buffers for Sensitive Resources

Sensitive Resource	Buffer Zone from Disturbance (feet)
Potential San Joaquin kit fox den	50
Known San Joaquin kit fox den	100
Natal San Joaquin kit fox den	500
Atypical San Joaquin kit fox den	50
Rodent burrows	50
Listed bird species active nests	0.5 miles
Burrowing owl burrow (breeding and nonbreeding season)	Pursuant to CDFW guideline
San Joaquin coachwhip, silvery legless lizard, coast horned lizard	30
American badger: Non-maternity dens Maternity dens	 50 200
Special-status plants	50
Crotch's bumble bee	50
Swainson's hawk	500 around nests
Blunt nose leopard lizard Non-active burrows and clutch sites Species observation within exclusion fencing	 50 250
Temblor legless lizard	30 around unearthed lizard
Northern California legless lizard, California glossy snake, San Joaquin coachwhip, coast horned lizard, and other reptiles	50
Giant Kangaroo Rat	50

MM 4.4-4 Occupied burrowing owl burrows shall not be disturbed during the species nesting season (February 1 through August 31). The following distances shall be maintained between all disturbance areas and burrowing owl nesting sites (Table 4.4-9).

Table 4.4-9: Setback Distances for Burrowing Owl Nesting Sites by Level of Proposed Project Impacts

Location		
Nesting sites	Nesting sites	Nesting sites
Time of Year		
April 1–Aug 15	**Aug 16–Oct 15**	**Oct 16–Mar 31**
Project Impact Level		
Low		
656 feet (200 meters)	656 feet (200 meters)	164 feet (50 meters)
Medium		
1,640 feet (500 meters)	656 feet (200 meters)	328 feet (100 meters)
High		
1,640 feet (500 meters)	1,640 feet (500 meters)	1,640 feet (500 meters)

Burrowing owls present in proposed disturbance areas or within 500 feet or as specified under an approved Habitat Conservation Plan (as identified during pre-disturbance surveys) outside of the breeding season (between September 1 and January 31) may be moved away from the disturbance area using passive relocation techniques approved by the CDFW. Passive relocation techniques in the CDFW Staff Report on Burrowing Owl Mitigation Guidelines (California Department of Fish and Game 2012) include installing one-way doors in burrow entrances for 48 hours, to ensure the owl(s) have left the burrow, daily monitoring during the passive relocation period, and collapsing existing burrows to prevent reoccupation. A minimum of one or more weeks would be required to relocate the owl(s) and allow for acclimatization to alternate off-site burrows. Prior to burrow exclusion or eviction, a burrowing owl management plan shall be prepared and approved by the CDFW. Destruction of burrows shall occur only pursuant to a management plan for the species approved by the CDFW; burrow excavation shall be conducted by hand whenever possible.

As an alternative to passive relocation, occupied burrows identified off site within 500 feet of construction activities may be buffered with hay bales, fencing (e.g., sheltering in place), or as directed by the qualified biologist and the CDFW, to avoid disturbance of burrows.

MM 4.4-5 The following are requirements for any and all grading and construction activities on all project components, including all injection wells, abandonment of wells, capture facilities and pipelines:

a. The qualified biologist surveys shall determine whether active bat maternity roosts are located in or within 250 feet of any disturbance area. All active bat maternity roosts shall be avoided during breeding periods, including postponing disturbance activities. If an active Sensitive or Protected Species bat maternity roost location is proposed to be disturbed, the qualified biologist shall consult with, the USFWS and CDFW to identify any additional minimalization measures which the qualified biologist determines with the wildlife agencies can actually be implemented based on field conditions. All such measures must be implemented for project activities.

b. The qualified biologist surveys shall determine if there is any plants that would be disturbed that provide habitat for the Crouch Bumblebee. If such habitat is determined that appropriate surveys shall be required after consultation with CDFW.

MM 4.4-6 The following additional measures shall be implemented to avoid and minimize potential significant adverse impacts to Crotch's bumble bee:

a. Protocol/focused surveys for Crotch's bumble bee and its requisite habitat features shall be conducted by a qualified biologist during the blooming period immediately prior to project construction following the methodology outlined in the Survey Considerations for California Endangered Species Act Candidate Bumble Bee Species (CDFW 2023).

b. If Crotch's bumble bee is detected during biological monitoring or observed at any point, the CDFW and the USFWS shall be notified to determine what additional measures would be necessary to prevent take of the species.

c. In the event that complete avoidance of Crotch's bumble bee is not feasible, MM 4.4-2 shall be implemented.

MM 4.4-7 The following additional measures shall be implemented to avoid and minimize potential significant adverse impacts to Temblor legless lizard:

a. Protocol/focused and pre-disturbance surveys shall be conducted using a CDFW-approved methodology to determine the presence of Temblor legless lizard at and/or near the project area

b. If Temblor legless lizards are detected during protocol/focused surveys, a Temblor legless lizard avoidance plan shall be prepared for the project that will result in avoidance of incidental take. At a minimum, the Temblor legless lizard avoidance plan shall be submitted for approval to the CDFW and the County.

c. In the event that complete avoidance of the Temblor legless lizard is not feasible, MM 4.4-2 shall be implemented.

MM 4.4-8 The following avoidance and measures will be implemented to protect Northern California legless lizard, California glossy snake, San Joaquin coachwhip, coast horned lizard, and other reptile species that have potential to occur in the BSA:

a. After installation of exclusion fencing, a qualified biologist shall conduct visual preconstruction surveys within the project footprint in areas of suitable habitat no more than 30 days prior to ground-disturbing activities. If any Northern California legless lizard, California gloss snake, San Joaquin coachwhip, coast horned lizard, or other reptiles are observed within exclusion fencing, they will be relocated to suitable habitat outside of the exclusion fencing by a qualified biologist.

b. At minimum, a 50-foot avoidance buffer shall be maintained surrounding Northern California legless lizard, California gloss snake, San Joaquin coachwhip, coast horned lizard, or other special-status reptile species unless CDFW agrees to a reduced buffer.

MM 4.4-9 The project proponent shall utilize the measures below to avoid and minimize impacts on Giant Kangaroo Rats (GKR) during Project activities. USFWS/CDFW shall be consulted if the avoidance and minimization measures, including GKR trapping and relocation, vary from what is described below. The project proponent shall then be required to implement any additional measures required by USFWS/CDFW.

a. A qualified biologist with required federal and State permits will conduct small mammal trapping in suitable habitat within the project area to determine presence/absence of GKR. Trapping efforts shall follow the USFWS Survey Protocol for Determining Presence of San Joaquin Kangaroo Rats (USFWS 2013). A survey proposal shall be submitted for review and approval by USFWS/CDFW. Survey results shall be submitted to USFWS/CDFW to determine if a federal biological opinion and State ITP will be required for GKR.

b. No more than 14 days prior to construction, the qualified biologist will conduct surveys to identify all potential burrows used by GKR within the disturbance areas and within 50 feet of areas where ground disturbance will occur.

c. The qualified biologist will establish a buffer of at least 50 feet around potential GKR burrows to avoid impacts on burrows. The buffer area will be delineated prior to construction activities and marked with brightly

colored markers that will be visible to workers as well as signs, stakes, flags, and/or rope or cord.

d. The project proponent will leave any undisturbed GKR food stores (e.g., haystacks, seed caches, or other stockpiled forage). If avoidance is not feasible, the qualified biologist will implement measures to keep the food stores intact, including temporarily relocating the food stores and covering seeds with plywood to allow temporary vehicle or on-foot access.

e. GKR burrows within the fenced disturbance area will be live trapped prior to surface disturbance or vegetation grubbing activities within that specific temporary exclusion fencing area and relocated. The project proponent's live-trapping and relocation procedures will adhere to a relocation plan for GKR approved by USFWS/CDFW prior to ground disturbance occurring.

f. After completion of live trapping, burrows would be fully excavated by hand. Any GKRs encountered will be allowed to escape out of harm's way into adjacent habitat (if present) or, at the discretion of the qualified biologist, will be collected and relocated.

g. Trapped or collected GKRs will be relocated within the project area at least 50 feet from ground disturbance areas. Live-trapping and relocation procedures will adhere to a relocation plan for GKR approved by USFWS/CDFW prior to ground disturbance occurring. The qualified biologist will conduct reconnaissance surveys of a potential release site to determine suitability. Artificial burrows and temporary enclosure fencing, based on best available practices currently accepted by USFWS/CDFW, will be used to reduce risk of predation or mortality resulting from disoriented animals fleeing the release site.

MM 4.4-10 The project proponent will utilize the measures below to avoid and minimize impacts on San Joaquin Antelope Squirrels (SJAS) during Project activities. CDFW will be notified if the avoidance and minimization measures, including SJAS trapping and relocation, vary from what is described below.

a. No more than 14 days prior to construction, a qualified biologist will conduct surveys to identify all potential burrows used by SJAS within the disturbance areas and within 50 feet of areas where ground disturbance will occur.

b. A qualified biologist will establish a buffer of at least 50 feet around potential SJAS burrows to avoid impacts on burrows. The buffer area will be delineated prior to construction activities and marked with brightly

colored markers that will be visible to workers as well as signs, stakes, flags, and/or rope or cord.

c. Any potential SJAS burrows detected by the qualified biologist within the temporary exclusion fencing installed after preconstruction surveys that cannot be avoided will be live trapped prior to surface disturbance or vegetation grubbing activities within that specific temporary exclusion fencing area and relocated. Live-trapping and relocation procedures will adhere to a relocation plan for SJAS approved by CDFW prior to ground disturbance occurring. The qualified biologist will conduct live trapping over at least five consecutive days. If possible, trapping and the relocation of SJAS will avoid the breeding/mating season (January to May) in order to avoid disrupting family units. Ideally, this will take place during late summer and early fall.

d. After completion of live trapping, burrows would be fully excavated by hand. Any SJAS encountered during the excavation will be allowed to escape to adjacent natural habitat (if present) or, at the discretion of the qualified biologist, collected and relocated.

e. Trapped or collected SJASs would be relocated to an area of suitable habitat in the project area, at least 50 feet from any disturbance areas. The qualified biologist will conduct reconnaissance surveys of a potential release site to determine suitability.

f. Only the qualified biologist is authorized to capture, handle, and relocate SJAS.

MM 4.4-11 Any potential San Joaquin kit fox dens (SJKF) (as defined in USFWS2011) detected during reconnaissance or focused/protocol surveys shall be reevaluated by the qualified biologist for species activity no more than 30 days prior to the commencement of ground disturbance in the required preconstruction survey. Potential kit fox dens shall be marked, and a 50-foot avoidance buffer shall be delineated using brightly colored stakes and flagging or similar materials to prevent inadvertent damage to the potential den. If the qualified biologist determines that an unoccupied potential den cannot be avoided, the den may be hand excavated in accordance with the USFWS Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance (USFWS 2011). If species activity is detected, the location shall be identified as a "known" kit fox den in accordance with the U.S. Fish and Wildlife Service species guidelines (USFWS 2011). A minimum 100-foot buffer from any disturbance area shall be maintained for known dens and a minimum 500-foot buffer from any disturbance area shall be maintained for natal dens. No excavation of a known or natal den shall occur without prior authorization from the USFWS and the CDFW. For activities occurring on land covered under an approved federal and/or State incidental take authorization, the requirements set

forth in those documents shall be implemented. Other standard measures to protect San Joaquin kit fox, including capping pipes, covering trenches, adding exit ramps to excavated areas, shall be implemented in accordance with MM 4.4-15.

MM 4.4-12 Occupied American badger dens detected during pre-disturbance surveys shall be flagged and ground-disturbing activities avoided within 50 feet of the den. Maternity dens shall be avoided and a minimum 200-foot buffer from disturbance shall be maintained during pup-rearing season (February 15 through July 1). Maternity dens must be avoided to the maximum extent feasible in the opinion of the qualified biologist. If an active maternity den is proposed to be disturbed, the qualified biologist, shall consult with the CDFW to identify any appropriate additional minimization measures which the qualified biologist determines, with the wildlife agencies, can actually be implemented based on field conditions. All such measures must be implemented for project activities.

MM 4.4-13 The following measures will be implemented to avoid take of Swainson's Hawks and to ensure protection of these animals during project activities:

a. At least one year prior to construction, a qualified biologist shall conduct a protocol survey within the project footprint and a 0.5 mile buffer zone following the Swainson's Hawk Advisory Committee *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Advisory Committee 2000). The Swainson's hawk protocol survey effort shall include:

   Phase I: Pre-breeding Season Nest Surveys (recommended optional); Schedule: one all day survey conducted from January to March;

   Phase II: Nesting Territory and Courtship Surveys; Schedule: three surveys conducted from sunrise to 10:00AM and/or 16:00PM to sunset; surveys conducted from March 20 to April 5;

   Phase III: Nesting Activity Surveys; Schedule: three surveys conducted from sunrise to noon and/or 16:30PM to sunset; surveys conducted from April 5 to April 20;

   Phase IV: Egg-laying and Incubation Monitoring (monitoring known nest sites only, if required); Schedule: monitoring conducted as needed per biologist discretion from April 21 to June 10;

   Phase V: Fledging and Post-fledging Monitoring (if required); Schedule: three monitoring days conducted from sunrise to noon and/or 16:00PM to sunset; monitoring conducted from June 10 to July 30.

b. If active Swainson's hawk nest(s) are identified during protocol surveys, Aera Energy shall coordinate with CDFW to develop appropriate avoidance buffers and to determine if a State ITP for Swainson's hawk is required.

c. At minimum, a 500-foot avoidance buffer shall be maintained surrounding active Swainson's hawk nests unless CDFW agrees to a reduced buffer.

MM 4.4-14 Pre-disturbance surveys for active bird nests must be conducted no more than 10 days prior to the commencement of disturbance. Surveys shall follow United States Fish and Wildlife and CDFW guidance and/or protocols, as applicable. If no active nests or nesting birds are identified, then project construction activities may proceed and no further mitigation measures for nesting birds are required. If active nest(s) are identified, the active nest(s) should be continuously surveyed for the first 24 hours after detection, to establish a behavioral baseline prior to any construction-related activities.

Once construction commences, all nests shall be continuously monitored to detect any behavioral changes as a result of the project (i.e., nest avoidance or abandonment). If behavioral changes are observed, the work causing that change shall cease until the owner/operator qualified biologist consults with the CDFW and the United States Fish and Wildlife and the qualified biologist used by the owner/operator implements the recommended measures. During such times as the qualified biological monitor is not on site while construction workers are on site, a minimum non-disturbance buffer of 250 feet shall be established around active nests and a 500-foot no-disturbance buffer around the nests of raptors until the breeding season has ended, or until a qualified biologist has determined that the birds have fledged and are no longer reliant upon the nest or parental care for survival, and any adult birds are no longer occupying the nest. Deviations from these no disturbance buffers may be implemented if the qualified biologist concludes that work within the buffer area would not cause nest avoidance or abandonment (e.g., when the disturbance area would be concealed from a nest site by topography) provided that notification of this determination of a deviation in the no-disturbance buffer is provided by the qualified biologist no less than 15 days in advance to the CDFW and the United States Fish and Wildlife.

MM 4.4-15 The following measures will be implemented to avoid take of blunt-nosed leopard lizard and to ensure protection of these animals during project activities:

a. Project activities will avoid all potential burrows that may be occupied by blunt-nosed leopard lizards. Suitable burrows within and adjacent to potential habitat for the species should be avoided by a minimum distance of 50-feet in all areas where ground-disturbing project activities will occur.

b. No more than one year prior to ground-disturbing activities, focused surveys following current CDFW and United States Fish and Wildlife protocols for detection of this species, or other methods approved by

both agencies shall be conducted in all potential blunt-nosed leopard lizard habitat within the work site and a 250-foot buffer area. If no individual blunt-nosed leopard lizards are observed during focused surveys, and surveys are current (e.g., completed in the same calendar year), then project activities may proceed.

c. If blunt-nosed leopard lizards are detected during focused surveys, a blunt-nosed leopard lizard avoidance plan shall be prepared for the project that will result in avoidance of incidental take of this species unless take is separately authorized under a Natural Communities Conservation Plan and appropriate federal authorization is obtained. At a minimum, the blunt-nosed leopard lizard avoidance plan shall be provided to the CDFW and the County, and shall contain the following elements:

    1. A Worker Environmental Awareness Program shall be implemented for all construction personnel before construction begins.
    2. During periods that are optimal for blunt-nosed leopard lizard activity (early spring through late fall), a qualified biologist will be present during all ground-disturbing activities. The qualified biologist will check the project site(s) and access route(s) daily during the blunt-nosed leopard lizard active season to determine presence or absence of lizards in or near the work areas. Monitoring by a qualified biologist is not required during periods of inactivity (the winter season).
    3. All open trenches or excavations shall be covered at the end of each workday or protected with the use of exclusion fencing to prevent wildlife entrapment. If an excavation is too large to cover, escape ramps shall be installed at an incline ratio of no greater than 2:1. All trenches and pipes shall be inspected for the presence of wildlife each day prior to the commencement of work. If blunt-nosed leopard lizards are observed at the work site during construction, construction shall cease within a 250-foot radius and the USFWS, and the CDFW shall be consulted to determine what additional measures would be necessary to prevent take of this species.
    4. Off-site locations where blunt-nosed leopard lizards have been observed or are likely to occur shall be clearly marked to prevent workers from driving off the road and to prevent inadvertent destruction of burrows. Barriers, such as exclusionary fencing may be installed. All construction equipment and construction

personnel vehicles will be checked prior to moving to ensure no blunt-nosed leopard lizard are under equipment/vehicles.

5. A speed limit of 10 miles per hour shall be posted and observed within 0.25 miles of any reported blunt-nosed leopard lizard observation.
6. Construction activities shall avoid burrows that may be used by blunt-nosed leopard lizards. Any location of proposed construction activity with potential to collapse or block burrows (i.e., stockpile storage, parking areas, staging areas, trenches) will be identified prior to construction in the blunt-nosed leopard lizard avoidance plan and approved by the qualified biologist. The qualified biologist may allow certain activities in burrow areas if the combination of soil hardness and activity impact is not expected to collapse burrows and no blunt-nosed leopard lizards have been found during pre-project surveys in the impact area.
7. All individual blunt-nosed leopard lizards observed above-ground will be avoided. Any individual blunt-nosed leopard lizard that may enter the project site(s) would be allowed to leave unobstructed, and on its own accord. If a blunt-nosed leopard lizard is detected during biological monitoring or observed at any other point, the CDFW and the USFWS shall be notified to determine what additional measures would be necessary to prevent take of the species.
8. If blunt-nosed leopard lizards are observed within the exclusionary fencing during construction, a 250-foot avoidance buffer will be erected on the north and south side of the buffer while the eastern and/or western edges of the fencing will be dis-assembled and lain on the ground to allow the blunt-nosed leopard lizard to leave on its own volition. Once the blunt-nosed leopard lizard is observed leaving the work area the fencing will be installed back to its previous condition and the 250-foot buffer removed. If the blunt-nosed leopard lizard does not leave the work area of its own volition within 24 hours, USFWS/CDFW will be consulted for further guidance.

MM 4.4-16 The owner/operator shall comply with the following for any and all grading and construction activities on all project components, including all injection wells, abandonment of wells, capture facilities and pipelines.

a. Prior to ground disturbance plant surveys for Protected Species and Sensitive Species must be completed by a qualified biologist during the appropriate blooming periods for species identification and detection (as

shown in Table 4.4-10). Plant surveys shall be conducted in accordance with all applicable protocols established by the USFWS and the CDFW for particular plant species (Plant Survey Protocol) and shall extend 50 feet from areas where any new disturbance would occur unless a greater survey distance is specified in the Plant Survey Protocol.

Table 4.4-10: Blooming Period of Special-Status Plants with Potential to Occur

Special-Status Plant Species	Optimal Blooming Period
Heart scale *(Atriplex cordulata* var. *cordulata)*	April – October
Lost Hills crownscale *(Atriplex coronata S. Watson var. vallicola)*	April – September
California jewelflower *(Caulanthus californicus)*	February – May
Recurved larkspur *(Delphinium recurvatum)*	March – June
Kern mallow *(Eremalche kernensis)*	January/February/March – May
Tejon poppy *(Eschscholzia lemmonii* ssp. *kernensis)*	February/March – May
Showy golden madia *(Madia radiata)*	March – May
San Joaquin woollythreds (*Monolopia congdonii*)	February – May
Forked Fiddleneck (*Amsinckia furcata)*	February – May
Coronata (*Atriplex coronata var. coronata)*	March – October
Carrizo Plain Corwnscale *(Atriplex flavida)*	March – July
Lemon's jewelflower *(Caulanthus lemmonii)*	February – May
Hoover's eriastrum (*Eriastrum hooveri*)	February/March – July
Cottony buckwheat (*Eriogonum gossypinum)*	March – September
Diamond-petaled California poppy (*Eschscholzia rhombipetala)*	March – April
Pale-yellow layia (*Layia heterotricha)*	March – June
California alkali grass (*Puccinellia simplex)*	March – May
San Joaquin bluecurls (*Trichostema ovatum)*	April/June/July – October

Table 4.4-10: Blooming Period of Special-Status Plants with Potential to Occur

Special-Status Plant Species	Optimal Blooming Period
King's gold (*Tropidocarpum californicum)*	February – March

All detected plant populations of Protected Species and Sensitive Species shall be identified in the field during the surveys with temporary flags or other visible materials to avoid and minimize impacts to the plant populations from any disturbance activities.

b. No incidental take or relocation of any plant listed under the federal Endangered Species Act, the California Endangered Species Act, or the California Native Plant Protection Act may occur unless the incidental take is authorized by the USFWS and/or the CDFW in a permit or other authorization, or in an approved Habitat Conservation Plan or Natural Communities Conservation Plan. If focused plan surveys detect the presence of any listed plant, the plant populations shall be buffered from disturbance activities by implementing applicable impact avoidance protocols established by the USFWS and/or the CDFW unless incidental take authority is obtained. Projects covered under incidental take authority shall conduct activities in accordance with the take authorization. The qualified biologist may consult with the CDFW to determine the recommended buffer distances required to prevent incidental take of a listed plant if avoidance protocols have not been established for the species. The qualified biologist shall confirm that all applicable listed plant buffers have been implemented prior to the commencement of any disturbance activity. All compensation for habitat loss shall be as determined through consultation with the wildlife agencies.

c. Sensitive species plant populations which are not Protected Species that may be impacted by new ground-disturbing activities must be avoided by a 50-foot buffer, as delineated and implemented by a qualified biologist used by the owner/operator.

MM 4.4-17 A Worker Environmental Awareness Program shall be developed and implemented for all personnel that could access the site prior to commencing any disturbance activities. The program shall consist of an on-site or center presentation that will describe the locations and types of sensitive plant, wildlife, and sensitive natural communities (collectively, "Biological Resources") on and near the site, an overview of the laws and regulations governing the protection of Biological Resources, the reasons for protecting the Biological Resources, the specific protection and avoidance measures that are applicable to the site, and the identity of designated points of contact should questions or issues arise, including the qualified biologist. The program shall provide training to recognize, avoid and report to applicable qualified biologists any Biological Resources on the site.

a. The Worker Environmental Awareness Program shall emphasize the need to avoid contact with on-site wildlife and avoid entry into areas where Biological Resources have been identified based on pre-disturbance field surveys and to implement the buffer avoidance or other protection measures established by the USFWS shall be identified CDFW or required by the Biological Resource mitigation measures. The training shall emphasize the importance of not feeding or domesticating wildlife and the need to avoid any trash, micro trash, or potential food disposal on site except in animal-proof containers emptied daily to avoid attracting or causing adverse impacts to special status wildlife.

b. All on-site personnel must sign a statement verifying that they have completed the Worker Environmental Awareness Program, and that they understand and agree to implement the biological requirements for the worksite. If signed employee statements are not available, documentation may be provided by Worker Environmental Awareness Program training records, which shall be kept by the owner/operator for a minimum of 5 years. Each owner/operator shall maintain a list of all persons who have completed the training program and shall provide the list to the County or to State and federal wildlife agency representatives upon request.

MM 4.4-18 After construction, but before operation of any Class VI Injection well for the CCS project, a 500-foot wildlife protection buffer setback from the edge of the well pad shall be established and fenced to prevent wildlife from accessing the site. The qualified biologist shall conduct full clearance surveys before any fencing installation and monitor the installation. Reasonable measures shall be used by the owner/operator when servicing the well to control the site to ensure that gates are not left open such that wildlife are permitted to enter. The qualified biologist shall create a protocol for the workers to implement to review the site before closing the gate to ensure not wildlife are trapped inside and for allowing for the escape of any wildlife that does inadvertently enter the fenced buffer area. Any wildlife found that might have been affected by exposure to CO_2 shall immediately cause a shutdown of all injection operations, compliance with all requirements of the EPA Class VI UIC permit and on-site consultant with California Fish and Game and USFWS.

MM 4.4-19 The following additional measures shall be implemented to avoid and minimize potential significant adverse impacts to Protected and Sensitive Species:

a. All vehicles shall observe a 20-mile-per-hour speed limit in all areas of disturbance and on unpaved roads unless otherwise posted. Off-road traffic outside of designated access routes is prohibited. Speed limit signs shall be posted in visible locations at the point of site entry and at regular intervals on all unpaved access roads.

b. All disturbance activities, except emergency situations or drilling that may require continuous operations, shall only occur during daylight hours. Nighttime disturbance activity for drilling purposes shall use

directed lighting, shielding methods, and comply with applicable lighting mitigation measures.

c. The project will limit nighttime activity to essential personnel only, including emergency response or security personnel, to ensure that vehicle traffic necessary during nighttime hours will minimize effects on Giant Kangaroo Rat and San Joaquin Antilope Squirrel.

c. The project will initiate a trash abatement program before starting project activities and will continue the program for the duration of the project. All food-related trash items and all forms of micro trash, such as wrappers, cans, bottles, bottle tops, and food scraps shall be disposed of in closed, animal-proof containers and removed daily from the site.

d. The project will minimize new disturbance and habitat fragmentation by consolidating infrastructure and confining all project-related parking, storage, laydown, and temporary equipment storage areas to previously disturbed areas to the greatest extent practicable.

d. Excavations, spoils piles, access roadways, and parking and staging areas shall subject to dust control as set forth in the dust control mitigation measures.

e. The use of herbicides for vegetation control shall be restricted to those approved by the USFWS and the CDFW. No rodenticides shall be used on any site unless approved by the USFWS, and the CDFW, and shall observe label and other restrictions mandated by the United States Environmental Protection Agency, California Department of Food and Agriculture, and State and federal laws and regulations. For split estates, no herbicides for vegetation control may occur in Tier 2 areas without surface owner approval.

f. No plants or wildlife shall be collected, taken, or removed from the site or any adjacent locations except as necessary for project-related vegetation removal or wildlife relocation by a qualified biologist and subject to all applicable permits and authorizations.

g. All open trenches or excavations shall be covered at the end of each workday to prevent wildlife entrapment. The agency-approved biologist will inspect all such materials for special-status wildlife before they are moved, buried or capped. If an excavation is too large to cover, escape ramps shall be installed at an incline ratio of no greater than 2:1. All trenches and pipes shall be inspected for the presence of wildlife each day prior to the commencement of work.

h. To enable San Joaquin kit foxes and other wildlife to pass through the project site, any perimeter fencing shall include a 4- to 8-inch opening between the fence mesh and the ground, or the fence shall be raised 4 inches above the ground except blunt-nosed leopard lizard exclusion

fencing. The bottom of the fence fabric shall be knuckled (wrapped back to form a smooth edge) to protect wildlife.

i. All vertical tubes used in project construction and chain link fencing poles, shall be temporarily or permanently capped to avoid the entrapment and death of special-status wildlife and birds. All pipes 1.5 inches or greater in diameter stored overnight on a project location must have end caps or other physical barriers that prevent wildlife from entering the pipe.

j. All dead or injured special status wildlife shall be left in place and reported to the USFWS and the CDFW within 48 hours of discovery for rescue or salvage. Discovery of State or federal listed species that are injured, or dead shall also be managed consistent with regulatory requirements, including being reported immediately via telephone and within 24 hours in writing, and with a copy to Kern County Planning and Natural Resources.

k. All drilling installations and operations will comply at all times with the applicable federal, State, County, and local law ordinances and regulations.

1. During preconstruction surveys, the qualified biologist shall delineate previously disturbed areas to be used by the owner/operator to minimize the amount of new disturbance.

m. All concrete and asphalt debris should be removed from the site for recycling or disposal at an authorized, permitted facility.

n. No vehicles or construction equipment shall be parked within a wetland or waterbody/dry wash.

o. No vehicles shall park within 50 feet of known special-status species dens, burrows, or precincts.

o. To the greatest extent feasible, vehicles left overnight will not be located within 50 feet of small mammal burrows.

o. Tracked vehicles and other construction equipment must be washed or maintained to be weed-free prior to entering and working within areas of new disturbance.

p. All washing of trucks, paint, equipment, or similar activities should occur in areas where runoff is fully contained for collection and off-site disposal. Wash water may not be discharged from the site and shall be located at least 100 feet from any water body, or sensitive Biological Resources.

q. Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland boundaries or waterbody, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land.

r. In the event that oil, produced water, or drilling mud containing oil are accidentally conveyed to an excavated area, the project proponent will implement measures to preclude Blunt Nose Leopard Lizard, Giant Kangaroo Rat, and San Joaquin Kit Fox access to the excavated area until oil and oil residues have been removed and no longer pose exposure risk to wildlife. Measures will include installation of temporary netting or covering to preclude species access.

r. All areas that must be avoided as result of the pre-disturbance surveys, and areas where new disturbance will occur, shall be clearly delineated by fencing or staking and flagging and/or rope or cord.

s. No firearms shall be allowed on any site.

t. No pets shall be allowed on any site.

u. No smoking may occur except in designated areas.

MM 4.4-20 Post-construction, the applicant shall restore temporarily impacted Allscale Shrubland and Red Brome or Mediterranean Grass Grasslands. A qualified habitat restoration specialist shall prepare a Habitat Mitigation and Monitoring Plan that outlines the following at minimum:

a. Mitigation work plan, including species palette, planting and irrigation schedule, hydroseeding, and erosion control;

b. Maintenance plan/schedule;

c. Success criteria;

d. Monitoring methods;

e. Monitoring and reporting schedule; and

f. Provisions for long-term and adaptive management.

MM 4.4-21: For permanent impacts to Allscale Scrubland and Red Brome or Mediterranean Grass Grasslands habitat, the Applicant shall either:

a. Purchase conservation bank credits at a minimum 2:1 replacement ratio; or

b. Obtain suitable mitigation lands to preserve Allscale Scrub shrubland habitat at a minimum 2:1 replacement ratio:

1. All land that is protected for the purpose of mitigation will be placed under a permanent conservation easement and managed in perpetuity;

2. Mitigation lands shall be monitored, with a monitoring and reporting schedule to be negotiated with the involved regulatory agencies (e.g., CDFW).

Level of Significance After Mitigation

Impacts would be less than significant.

Impact 4.4-2: Have a Substantial Adverse Effect on any Riparian Habitat or Other Sensitive Natural Community Identified in Local or Regional Plans, Policies, Regulations, or by the California Department of Fish and Wildlife or United States Fish and Wildlife Service

The project area does not overlap any USFWS-designated critical habitat. One sensitive plant community, Allscale Scrub, would be impacted by project activities. Allscale Scrub is located sporadically throughout the project area and is most common in the northern half of the project area, where it is generally utilized by a variety of special-status species. However, as explained in Section 4.4.2, *Environmental Setting*, vegetation within the state is ranked with an "S" rank, but only those that are of special concern (S1-S3 rank) are generally evaluated under CEQA. Allscale Scrub only has a State rarity rank of S4 and is, therefore, not considered sensitive. There would be no impacts with respect to adverse effects on riparian or sensitive natural communities, and no mitigation measures are required.

Mitigation Measures

No mitigation measures are required.

Level of Significance

No impact would occur.

Impact 4.4-3: Have a Substantial Adverse Effect on Federally Protected Wetlands as Defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through Direct Removal, Filling, Hydrological Interruption, or Other Means

As described in Section 4.4.2, *Environmental Setting*, potential jurisdictional aquatic features observed in the project area include sections of Chico Martinez Creek, remnants of ephemeral streams, and various drainage ditches. Table 4.4-5 quantifies the potential jurisdictional waters (in acres, square feet, and linear feet) for the delineated resources within the BSA. Based upon the initial impact assumptions there would be 40,508 square feet or 0.930 acres of temporary impacts on potentially jurisdictional aquatic features within the BSA (Appendix C-2, Figure 4.4-5). There are no anticipated permanent impacts on potentially jurisdictional aquatic features because pipelines would be installed on pipe supports that span the creek crossings.

It is not anticipated that jurisdictional aquatic resources would be directly impacted, and the project would avoid these features to the extent feasible, such as spanning drainages along the project area. However, if avoidance is impractical, to minimize the impact on potential waters of the State and fulfill the regulatory requirements associated with discharges to waters of the State, the following mitigation measures should be implemented should the project design impact the existing riverine features. If the riverine feature is not determined to be a water of the State or under the jurisdiction of any agency, mitigation measures would not be warranted.

Implementation MM 4.4-22 and MM 4.4-23 would ensure that project activities would not disturb State or federally regulated wetlands and waters unless the activity is specifically authorized by the issuance of permits or approvals as required by State and federal laws and that activities in the vicinity of wetlands and water bodies would not adversely disturb them. Other mitigation measures identified in this EIR would further reduce potential State or federally jurisdictional wetlands and waters, including dust control, spill and hazardous material avoidance and containment, surface and subsurface water quality and hydrology, mitigation measures.

Mitigation Measures

MM 4.4-22 Pre-disturbance surveys shall be conducted by a qualified biologist during the appropriate periods for detecting Sensitive Natural Communities that could occur within the project area. The surveys shall be completed consistent with applicable protocols approved by the USFWS and/or the CDFW, including the Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFW 2009). The qualified person shall map and identify all sensitive natural communities, including riparian communities that occur in or within 100 feet of any new disturbance area. The site plan for the proposed activity shall identify waters, wetlands, resources subject to Section 1600 of the CFGC, and other riparian habitats that occur in and within 100 feet of the disturbance area.

MM 4.4-23 No land disturbance activity in any Sensitive Natural Community that requires a State or federal permit, including State or federally regulated wetlands and waters, shall occur unless the activity is specifically authorized by the issuance of permits or approvals as required by State and federal law. This provision is not intended to restrict survey activities or restrict permit approvals for such disturbance activities. However, no new wells, tanks, sumps or ponds shall be constructed within 50 feet of federal or State waters or wetlands.

Level of Significance After Mitigation

Impacts would be less than significant.

Impact 4.4-4: Interfere Substantially with the Movement of Any Resident or Migratory Fish or Wildlife Species or with Established Resident or Migratory Wildlife Corridors or Impede the Use of Wildlife Nursery Sites

As mentioned in Section 4.4.2, *Environmental Setting*, there are no known, widespread, wildlife corridor studies that include the BSA. The nearest Essential Connectivity Area is the Temblor

Range, approximately 5 to 10 miles west of the Belridge oilfields. However, transient special-status species are known to occur within the vicinity of the BSA. Implementation of the Biological Resources mitigation measures would reduce wildlife movement impacts. Other mitigation measures identified in this EIR to further reduce impacts on wildlife movement include dust control, nighttime lighting, noise controls, spill and hazardous material avoidance and containment, and surface and subsurface water quality and hydrology (including but not limited to Kern River and Poso Creek channels), measures. Implementation of the Biological Resources mitigation measures such as MM 4.4-1, MM 4.4-3, MM 4.4-14, MM 4.4-17, and MM 4.4-19 would reduce wildlife movement impacts to less than significant.

Mitigation Measures

Implement MM 4.4-1, MM 4.4-3, MM 4.4-14, MM 4.4-17, and MM 4.4-19, as previously identified.

Level of Significance After Mitigation

Impacts would be less than significant.

Impact 4.4-5: Conflict with Any Local Policies or Ordinances Protecting Biological Resources, Such as a Tree Preservation Policy or Ordinance

The project does not conflict with the KCGP and is not subject to any local ordinances. Therefore, there are no impacts with respect to local policies and ordinances, and no mitigation measures are required.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

Impact 4.4-6: Conflict with the Provisions of an Adopted Habitat Conservation Plan, Natural Conservation Community Plan, or Other Approved Local, Regional, or State Habitat Conservation Plan

The project is not located within an adopted HCP or natural conservation community plan. Therefore, there are no impacts with respect to the required provisions, and no mitigation measures are required.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

4.4.5 Cumulative Setting, Impacts, and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present, and reasonably foreseeable future oil and gas development including wells and abandonment activity to implement carbon capture and storage (CCS) projects constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities, and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

Section 4.4, Biological Resources of the Oil and Gas EIR has facts and evidence for the record on the natural lands as well as species in all the oilfields. Section 4.4, Biological Resources, of the Oil and Gas EIR has facts and evidence for the record on the natural lands as well as species in all the oilfields.

The aforementioned documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells per year countywide of various types (production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 other wells (cyclic wells, Senate Bill [SB] 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for eight years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. California Geologic Energy Management Division permitting for all wells with the exception of plugging and abandonments has never averaged over 2, 000 permits a year (as implementation in some years of the Kern County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts on biological resources is considered the western section of Kern County near the floor of the San Joaquin Valley. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects*, would have on biological resources. This geographic scope of analysis is appropriate because the biological resources within this area are expected to be similar to those in the project site because of their proximity.

Impact 4.4-7: Contribute to Cumulative Biological Resource Impacts

The project site is located west of SR 33, approximately 7 miles southwest of the community of Lost Hills. The project area is bordered on all sides by existing oil and gas exploration and production. Existing land use in the outside of the project area generally includes agricultural lands; current, past, and abandoned oil and gas exploration and production land; and undeveloped land. State and federal lands within the oil and gas reserve are managed primarily to conserve biological resources. Certain State or federal lands surrounding the project site are subject to commercial uses, including leases for oil and gas exploration and development, which have biological resources similar in quality to the project site.

Future activities within the oil and gas reserve including those related to the proposed project could contribute to a significant cumulative impact on project area biological resources because future use and development of federal, State, and incorporated urban lands are not within the County's jurisdiction or control. Future land uses and development could affect biological resources in each of these jurisdictions and would be undertaken as independent actions with associated impacts, avoidance and minimization requirements, and mitigation, if required, under applicable federal, State, regional, and local agency law.

Although the cumulative impacts from the proposed project would be less than significant due to the CCS Surface Land Area use restrictions, other clean energy projects that are in the valley portion of Kern County has the potential to impact species and reduce habitat. Therefore, the cumulative impacts of the project when combined with other known and unknown projects, would be significant and unavoidable. All reasonable and feasible mitigation measures have been evaluated and included.

Mitigation Measures

Implement MM 4.4-1 through MM 4.4-21, as described above.

Level of Significance After Mitigation

Cumulative impacts would be significant and unavoidable.

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Section 4.5

Cultural Resources

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Section 4.5

Cultural Resources

4.5.1 Introduction

This section of the Environmental Impact Report (EIR) provides contextual background information on historical resources in the project site, including the area's prehistoric, ethnographic, and historical settings. This section also summarizes the results of preliminary cultural surveys of the project site and analyzes the impacts on cultural resources that would result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers [km]) southwest of the community of Lost Hills and west of State Route (SR) 33.

This section is based on the Cultural Resources Inventory Report prepared by Stantec Consulting Services Inc. (Stantec) (Stantec 2023) (included as Appendix D-1 of this EIR) and the Kern County Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting, certified on November 9, 2015), supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding oilfield environmental impacts and cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under California Environmental Quality Act (CEQA) (Guidelines Section 15152).

The cultural resources report and Native American consultation was conducted for purposes of compliance with CEQA and Assembly Bill 52. Due to the confidential nature of the location of cultural resources, this evaluation does not include maps or location descriptions and is not included in the appendix. The project's potential impacts on tribal cultural resources are addressed in Section 4.18, *Tribal Cultural Resources*.

A description of the environmental setting (affected environment) for cultural resources is presented in Section 4.5.2, *Environmental Setting*. The regulatory setting applicable to cultural resources is presented in Section 4.5.3, *Regulatory Setting*, and Section 4.5.4, *Impacts and Mitigation Measures*, discusses project impacts and associated mitigation measures.

Cultural Resources Terminology

For the purposes of CEQA, "historical resources" generally refer to cultural resources that have been determined to be significant, either by eligibility for listing in state local registers of historical resources, or by determination of a lead agency (see definitions below). Historical resources can

also include areas determined to be important to Native Americans such as "sacred sites." Sacred sites are most often important to Native American groups because of the role of the location in traditional ceremonies or activities. "Cultural resources" generally refer to prehistoric and historical period archaeological sites and the built environment. Cultural resources can also include areas determined to be important to Native Americans.

For the purpose of this Cultural Resources section, the "project footprint" is defined as the area of disturbance associated with proposed facilities located on the surface of the project site, including associated infrastructure.

Below are definitions of key cultural resources terms used in this section:

- **Alluvium:** a fine-grained fertile soil consisting of mud, silt, and sand deposited by flowing water on flood plains, in riverbeds, and in estuaries.
- **Archaeological Site:** A site is defined by the National Register of Historic Places (NRHP) as the place or places where the remnants of a past culture survive in a physical context that allows for the interpretation of these remains. Archaeological remains usually take the form of artifacts (e.g., fragments of tools, vestiges of utilitarian, or non-utilitarian objects), features (e.g., remnants of walls, cooking hearths, or midden deposits), and ecological evidence (e.g., pollen remaining from plants that were in the area when the activities occurred). **Prehistoric archaeological sites** generally represent the material remains of Native American groups and their activities dating to the period before European contact. In some cases, prehistoric sites may contain evidence of trade contact with Europeans. **Ethnohistoric archaeological sites** are defined as Native American settlements occupied after the arrival of European settlers in California. **Historic archaeological sites** reflect the activities of nonnative populations during the Historic period.
- **Artifact:** An object that has been made, modified, or used by a human being.
- **Cultural Resource:** A cultural resource is a location of human activity, occupation, or use identifiable through field inventory, historical documentation, or oral evidence. Cultural resources include archaeological resources and built environment resources (sometimes known as historic architectural resources), and may include sites, structures, buildings, objects, artifacts, works of art, architecture, and natural features that were important in past human events. They may consist of physical remains or areas where significant human events occurred, even though evidence of the events no longer remains. Cultural resources also include places that are considered to be of traditional cultural or religious importance to social or cultural groups.
- **Cultural Resources Study Area:** All areas within the project site boundary plus a 1-mile buffer.
- **Cultural Resources Survey Area:** All areas of potential permanent and temporary impacts for a reasonable worst-case development within the project site, plus a 150-foot buffer to account for secondary or unanticipated impacts.

- **Ethnographic:** Relating to the study of human cultures. "Ethnographic resources" represent the heritage resource of a particular ethnic or cultural group, such as Native Americans or African, European, Latino, or Asian immigrants. They may include traditional resource-collecting areas, ceremonial sites, value-imbued landscape features, cemeteries, shrines, or ethnic neighborhoods and structures.
- **Historic period:** The period that begins with the arrival of the first nonnative population and thus varies by area. In 1772, Commander Don Pedro Fages was the first European man to enter Kern County, initiating the historic period in the project study area.
- **Historical resource:** This term is used for the purposes of CEQA and is defined in the CEQA Guidelines (§15064.5) as: (1) a resource listed in, or determined to be eligible for listing in the California Register of Historical Resources (CRHR); (2) a resource included in a local register of historical resources, as defined in Public Resources Code (PRC) §5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC §5024.1(g); and (3) any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California by the lead agency, provided the lead agency's determination is supported by substantial evidence in light of the whole record.
- **Holocene:** Of, denoting, or formed in the second and most recent epoch of the Quaternary period, which began 10,000 years ago at the end of the Pleistocene.
- **Isolate:** An isolated artifact or small group of artifacts that appear to reflect a single event, loci, or activity. It may lack identifiable context but has the potential to add important information about a region, culture, or person. Isolates are not considered under CEQA to be significant and, thus, do not require avoidance mitigation (CEQA Statute §21083.2 and CEQA Guidelines §15064.5). All isolates located during the field effort, however, are recorded and the data are transmitted to the appropriate California Historical Resources Information System Information Center.
- **Lithic:** Of or pertaining to stone. Specifically, in archaeology lithic artifacts are chipped or flaked-stone tools, and the stone debris resulting from their manufacture.
- **Native American sacred site:** An area that has been, and often continues to be, of religious significance to Native American peoples, such as an area where religious ceremonies are practiced or an area that is central to their origins as a people. They also include areas where Native Americans gather plants for food, medicinal, or economic purposes.
- **Pleistocene (Ice Age):** An epoch in the Quaternary period of geologic history lasting from 1.8 million to 10,000 years ago. The Pleistocene was an epoch of multiple glaciations, during which continental glaciers covered nearly one fifth of the earth's land.
- **Prehistoric period:** The era prior to 1772. The latter part of the prehistoric period (post-1542) is also referred to as the protohistoric period in some areas, which marks a transitional period during which native populations began to be influenced by European presence resulting in gradual changes to their lifeways.

- **Quaternary Age:** The most recent of the three periods of the Cenozoic Era in the geologic time scale of the International Commission on Stratigraphy. It follows the Tertiary Period, spanning 2.588 ± 0.005 million years ago to the present. The Quaternary includes two geologic epochs: the Pleistocene and the Holocene Epochs.
- **Stratigraphy:** The natural and cultural layers of soil that make up an archaeological deposit, and the order in which they were deposited relative to other layers.
- **Unique Archaeological Resource:** This term is used for the purposes of CEQA and is defined in the CEQA Guidelines (§15064.5) as an archaeological artifact, object, or site, about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it either contains information needed to answer important scientific research questions; has a special and particular quality such as being the oldest of its type or the best available example of its type; or, is directly associated with a scientifically recognized important prehistoric or historic event or person.

4.5.2 Environmental Setting

The project site is located within the Central Valley portion of unincorporated Kern County and is comprised of forty-five parcels within the administrative boundaries of the Belridge oilfields. The Belridge oilfields are contiguous and located west of SR 33, approximately 7 miles southwest of the community of Lost Hills (population 2,370). Together, the two Belridge oilfields cover an area of approximately 13 miles long and 3 miles wide. Aera Energy is the primary operator within both oilfields.

The project area is characterized by heavy oil and gas exploration and production including existing well pads, processing facilities, pipeline routes, and access roads. Development in the surrounding area is predominantly oil and gas production, agricultural, and municipalities such as the towns of Bakersfield, Taft, and Buttonwillow. The project area boundaries encompass a mix of parcels that have been owned and used for oil and gas production or on which leases have been acquired by the project proponent for intended future oil and gas production.

Existing land use in the vicinity of the project site generally includes oil and gas exploration and production, grazing, and agricultural lands. The sensitive receptor closest to the proposed project site is a small housing tract on Lost Hills Road, north of Lerdo Highway, roughly 3 miles east of the proposed project site. The community of Lost Hills is located 7 miles northeast of the proposed project site. Lost Hills Wonderful Park, a local park, is located approximately 7 miles northeast of the nearest injection well.

Ethnographic Setting

The Belridge oilfields and the surrounding areas are within the ethnographic territory of the Southern Valley Yokuts. The Southern Valley Yokuts have been the subject of considerable study by numerous researchers (Stantec 2023; Appendix D-1). The Southern Valley Yokuts' homeland was centered near water sources including the Tulare, Buena Vista, and Kern Lakes and connecting sloughs and rivers. Prior to the emergence of modern agricultural practices in the region, the San

Joaquin Valley (SJV) was a landscape dominated by networks of interconnecting watercourses, lakes, and sloughs at historic contact. The Southern Valley Yokuts, primarily the Wowol, Tachi, and Chunut tribes, occupied the Tulare Lake Basin. Tulare Lake, part of the larger Tulare Lake Basin, was a large freshwater lake formed by the consolidation of alluvial fan dams generated by the Kings River to the east and Los Gatos Creek to the west. People inhabited the Tulare Lake region from at least 13,000 calibrated years before present (CYBP) to after historic contact. At its maximum, the lake covered some 100 square miles and boasted a diverse biotic community that supported a large population of various Yokut tribes. Buena Vista Lake, which was the second largest lake in the Tulare Lake Basin, was fed by the waters of the Kern River and was connected with Kern and Tulare Lakes via sloughs. During the mid-20th century, Buena Vista Lake dried up after its tributary rivers were impounded by the construction of Isabella Dam for agricultural and municipal water uses.

Natural and anthropogenic factors have heavily impacted the integrity of archaeological sites in the Central Valley. Fluctuations in temperature since the Pleistocene created different periods of increased precipitation and flooding which morphed the Valley's terrain. These floods either washed away artifacts from the earliest periods or deeply deposited them under alluvial soils. Agricultural development, levee construction, and river erosion during historic times have also contributed to the destruction of surface sites. Artifacts have also been taken by private collectors through time, making interpretation more difficult since this precludes analysis by anthropologists and the provenience which provides context is likely lost. Our interpretations of the early peopling of the Central Valley are also impacted by biases in data introduced by poor sampling strategies in the past. Early archaeological work in the Central Valley focused primarily on the recovery of artifacts and burials while ignoring dietary remains and technological features. Burials and artifacts alone cannot present an accurate picture of past events. Continuing work has refined our understanding of the Central Valley's archaeological record. The Southern part of the Central Valley has fewer recorded sites than the rest of the Valley north of the King's River which is the traditional historic divide between Northern and Southern Yokut territories. Because of this, data from the rest of the Valley is necessary to have a wholistic understanding of the cultural patterns of the southern section of the Valley. The chronology used in this report will be organized using references listed in Appendix D-1. This classification scheme will be applied because it is comprehensive enough to provide a chronological framework for the cultural patterns that appear throughout the Valley and, because it incorporates newer radiocarbon dates adjusted with modern calibration curves.

Prehistoric Setting

The southern SJV region has received minimal archaeological attention compared to other areas of the state. This is due, in part, to the fact that the majority of California archaeological work has been concentrated in the Sacramento Delta, Santa Barbara Channel, and Mojave Desert areas. Although knowledge of the prehistory of the project area is limited in specific details, enough is known to conclude that the archaeological record is broadly similar to central and especially south-central California as a whole. Therefore, the general prehistory of the project area can be outlined as provided in the following sections.

Paleo-Indian (11,550 to 8550 cal B.C.)

During the terminal Pleistocene, western California's climate was more seasonal than today, with cooler temperatures, greater effective precipitation, and a longer rainy season. At the onset of the Holocene, temperatures in western California increased as precipitation decreased gradually. By 10,100 CYBP, Tulare Lake was stable and shallow reaching depths ranging from 64 m to 58 m. The earliest accepted evidence of human occupation of the Central Valley are basally thinned and fluted projectile points. These points are dated in other parts of North America to at least 12,900 CYBP. In the SJV, these points have only been found in Tracy Lake, the Woolfsen mound, and the Tulare Lake Basin. It is assumed that these first peoples were generally nomadic with their subsistence being based on large game hunting and fishing. There is no direct evidence from western California that these early people hunted Pleistocene megafauna, but it is highly likely. Stemmed points are also found in association with fluted points. It is currently theorized that stemmed points may be coeval with Clovis fluted technologies or older.

Lower Archaic (8550 to 5550 cal B.C.)

In the Central Valley, the Lower Archaic is mostly represented by isolated finds. These finds include stemmed points, chipped stone crescents, flaked-stone artifacts, and concave base points. The only Central Valley archaeological site definitively dated to the Lower Archaic was found on the past shoreline of Buena Vista Lake. Radiocarbon dates from freshwater mussels at KER-116 ranged from 7175 and 6450 cal B.C. Lithics recovered at KER-116 include three chipped stone crescents, a stemmed projectile point fragment, a carved stone atlatl spur, and a few small-flaked-stone implements. A faunal assemblage recovered from KER-116 shows that freshwater fish and mussels, waterfowl, and artiodactyls were consumed. While milling tools are largely absent from Valley floor assemblages, including KER-116, Lower Archaic sites in the adjoining Sierra Nevada and Coast Range foothills contain abundant milling equipment and other indications of reliance on plant foods. How Valley and Foothill adaptations during the Lower Archaic relate to each other is unclear. The establishment of cultural interaction spheres is also seen in Lower Archaic Valley deposits. A variety of stemmed points styles are found in Lower Archaic deposits of Tulare basin that resemble styles from throughout California and from the Great Basin. Marine shell beads from California are also found in archaeological deposits in the Great Basin that are coeval to the Lower Archaic. Obsidian from the Eastern Sierra mountains is found in Lower Archaic Great Basin deposits.

Middle Archaic (5550 to 550 cal B.C.)

During the Middle Archaic, California's climate became warmer and dryer causing the decline and desiccation of Tulare Lake and the decline of other western lakes as well. Sea levels also began to rise at this time causing the Central Valley to become a wetland environment. The archaeological record shows more diversified subsistence-settlement patterns during this time. Some sites show evidence of an increasing emphasis on seed processing while others show placement of emphasis on hunting, fowling, and fishing. Artifacts from this period include Haliotis shell ornaments in varied geometric shapes, Olivella and Haliotis beads, distinctive spindle-shaped charmstones,

cobble mortars, chisel-ended pestles, heavy projectile points, and mortars and pestles. A tradition of extended westerly oriented burials known as the Windmiller Pattern appears throughout the SJV. Bones were extensively utilized for tools, such as for awls, fish spear tips, saws, and pressure flakers which were used in the manufacture of flaked-stone implements such as projectile points. Sites also show increasing residential stability along river corridors of the Sacramento and San Joaquin Valleys.

Upper Archaic (550 cal B.C. to cal A.D. 1100)

In the Upper Archaic, there was an abrupt turn to cooler, wetter, and more stable climate and the refilling of lakes that had desiccated in the middle Holocene. The archaeological record for the Upper Archaic is better preserved and understood compared to preceding periods. There is evidence for the existence of different cultural groups in the Central Valley at this time. Large, mounded villages associated with Berkley pattern assemblages appear in the lower Sacramento Valley. Berkley pattern village sites have extensive debris and features that reflect long-term residential occupation. The Windmiller cultural pattern is still seen in archaeological assemblages from this time. Little is known about the cultures that occupied the Southern SJV during the Upper Archaic. Southern SJV Upper Archaic village sites that have been excavated also show signs of long-term occupation and exploitation of aquatic and terrestrial environments for food. New types of bone tools and other implements made of bone such as wands, tubes, and ornaments appear in the archaeological record.

Groups throughout the Valley varied in what they harvested. Foods that were consumed by different groups included acorns, salmon, shellfish, rabbits, and deer. In the SJV, People were still using obsidian sourced from the east side of the Sierra Nevada and, some southern SJV sites used obsidian from the North Coast Ranges.

Emergent Occupation (cal A.D. 1100 to Historic)

The Climate in the Central Valley at this time was relatively unchanged from that of the Late Holocene, but flooding and drought events did occur. The archaeological record of the Emergent Occupation is the most substantial and comprehensive compared to earlier periods and shows the most diversity. After 1,000 A.D., many archaic traditions and tools disappeared throughout the Central Valley and new cultural traditions similar to those seen by European-Americans at contact emerge. Between about A.D. 1000 and 1300, the bow and arrow is introduced to the Central Valley and replaces the atlatl. Villages are structured around rivers, tributaries, and deltas. Two broad phases occur at this time: the Lower and Upper Emergent.

Artifacts associated with the Lower Emergent phase include banjo-type *Haliotis* (abalone) ornaments, bird bone whistles, soapstone pipes, and rectangular *Olivella* sequin beads. During the Lower Emergent, the Stockton serrated point is developed in the delta area. Panoche side-notched points and cottonwood points are found in Lower Emergent Occupation deposits in SJV Gunther-barbed points are introduced in the northern Sacramento Valley During the Lower Emergent. Artifacts associated with the Upper Emergent, include corner-notched and desert series arrow points, *Olivella* lipped and clam disk beads and bead drills, magnesite cylinders, hopper mortars,

and village sites with pits resembling known ethnographic settlements. Mammal, fish, and bird bone are found in Upper Emergent period middens from many sites. More mortars and pestles appear throughout the Valley after 1,000 A.D. with small seeds, acorn, pine nuts, manzanita becoming more economically important in the northern Central Valley.

Historic Context

Historic Period

European contact with the Yokuts initiated in 1772, when a detachment of Spanish soldiers under the command of Pedro Fages ventured through the Tejon Pass into the SJV. The only other significant 18th century Spanish contact with the Southern Valley Yokuts was a visit by friar Francisco Garcés in 1776. No significant European contact with the Southern Valley Yokuts occurs again until the beginning of the 19th century when Spaniards more actively entered and proselytized the area. While Spanish colonization and missionization heavily altered the traditional socio-cultural practices of the Yokuts, the Spanish never successfully took over the southern Valley. During the time when California was part of Mexico (1822 to 1846), the most significant Mexican influence was a severe malaria outbreak in 1833 that killed approximately 75 percent of the Native population. With the annexation of California by the United States, the discovery of gold in Sutter's Mill, and the incorporation of California as a State by the U.S. Government, the SJV was overrun with settlers who occupied native lands.

At contact, the native populations of the Central Valley were numerous, and their socio-cultural practices were rich and complex. Archaeological assemblages dating to between cal A.D. 1000 to 1769 such as arrow points, increased variation in burials, pottery, shaped mortars and pestles, changes in arrow point styles, and *Olivella* bead blanks all indicate that people in the area were engaged in a rich and expansive interaction sphere. Many of these objects and associated practices were still largely in use at European contact. It is estimated that 100,000 Native people lived in the Central Valley between A.D. 1772 and 1821.

The Spanish presence in the region played a part in the dispersal of native populations from the foothills and depopulation of entire villages. The Indigenous population in the region was severely reduced by European diseases introduced by the Spanish. The precipitous decline of Indigenous population and disruption of traditional lifeways by the Spanish Mission system left the surviving Natives despondent and unresistant making the process of dispossession by Euro-Americans relatively easy as the settlers, sometimes forcibly, removed Indian families and communities. The few surviving Southern Valley Yokuts were sent to the Tejon reservation established at the base of the Tehachapi Mountains, or to the Fresno reservation near Madera. These reservations failed to prosper, and in 1859, the Native Americans who remained on them were moved to the Tule River reservation.

Historic period effects on the landscape began with ranching and mineral extraction during the mid-1850s; gold mining was an important local enterprise as well as stock-raising and farming and to a lesser extent. By 1850, approximately 300,000 people immigrated to California from around the world in search of gold. People that moved into the SJV paid little mind to the oil seeps they saw

along the Old Road when they entered the Valley until the early 1860s. The first oil refinery was erected in Titusville, Pennsylvania in 1861 after it was discovered that bitumen from the seeps could be refined into kerosene.

By 1865, oil was exploited throughout Southern California. One of the most significant oil discoveries in California occurred in Kern County in the lower SJV. The Kern County oilfields cover a large swath of land beginning at the base of the Tehachapi Mountains and running north through the lower SJV toward the community of Taft. The resulting oil discoveries in Kern County drew thousands of skilled and unskilled workers into the southern SJV and almost immediately created boomtowns, such as McKittrick, Taft, Arbuckle, Fellows, and Reward. The railroad lines that traveled from the SJV oilfields to various refineries in the state were essential in the growth and success of the oilfields. From 1903 to 1906, California became the top oil producing state. Oil discoveries in the kern region ended with World War II but the area remains a major source of oil to the present day.

Belridge Oilfields

The Belridge oilfields are 13 miles long by 3 miles wide. The property is sectioned into North, Middle, and South Belridge for land holding reasons. It overlies three large petroleum reservoirs: the Tulare pool, the Diatomite pool, and the Sub-Monterey pool. The field lies above the crest of a large, elongated anticline. Continuous vertical oil columns ranging up to 1,300 feet are trapped along the crest of the anticline. Natural faults created by extension of the growing anticline and movement of the San Andreas fault allow hydrocarbons to leak from source beds to overlying soils.

The Tulare pool is twelve miles long by three miles wide and covers 10,500 acres. The Tulare pool is relatively shallow running 400 to 1,000 feet beneath the overlying alluvium deposited over the last circa 12,000 years. The Tulare pool is used as a source of heavy (11–15° American Potroleum Institute [API]) oil. The soils of the Tulare pool are highly porous and permeable. The Tulare reservoir rests directly on top of the Diatomite reservoirs. The Tulare reservoir was the focus of field development and production until technological advances shifted the focus to the deeper Diatomite rocks.

The Diatomite pool is fifteen miles long by three-quarters of a mile wide and covers 8,000 acres. It runs 800 to 2,000 feet in depth. The Diatomite pool is used as a source of light (23–39° API) oil. The reservoir rock of the diatomite pool is composed of the silica left behind by the diatoms that were deposited through time. The Belridge Diatomite has a high matrix porosity (50–70%) in its upper levels, is highly compressible (100-300 x 10-6 psi-1) and has a very low matrix permeability (0.1–3.0 md). Because of the low matrix permeability of the Diatomite, the pools were commercially unproductive until 1977 when the hydraulic fracture method could be applied successfully to retrieve the oil.

The Sub-Monterey pools are 4 miles long by 1 mile wide. They span from 6–9,400 feet in depth and have a productive size of 1,600 acres. Gas and light oil are extracted from the sub-Monterey pools. Natural fractures caused by tectonic movement allows the oil trapped in the sub-Monterey pool to rise to the surface and seep into the other pools. The following section will present a history

of Belridge oilfield and wells that were dug to access these petroleum deposits from 1911 to the present. This history presented here borrows heavily from Allan and Lallicata's *the Belridge Giant Oil Field–100 Years of History and a Look to a Bright Future* (2012).

Belridge Oil Field was founded by five families when the Tulare & Diatomite pools were tapped into with the excavation of Well #101 in 1911. Well #101, located in South Belridge, allowed Belridge Oil Co. to begin producing heavy oil. The Tulare and Diatomite pools were accessed again in 1912 in North Belridge. During the 1920s, approximately 100 wells were drilled in South Belridge and thirty wells in North Belridge. By the late-1920s, steel derricks and diesel engines replaced wooden derricks powered by steam because of the increased safety, efficiency, and ability to handle longer casing strings.

In the 1930s, the sub-Monterey pools were discovered and developed in North Belridge and production was further expanded with the addition of 170 more wells. The deeper Temblor Sand sub-Monterey reservoirs were discovered at 6,000 to 8,000 feet (1800–2450 m) in North Belridge and became important petroleum resources for World War II. In 1932, the Discovery well for 64 Zone, well 64-27N, was drilled into the sub-Monterey formations. In June 1934, General Petroleum drilled Berry 1-30 to TD at 11,377 feet (3468 m), the deepest well in world at the time. The well utilized mud log and driller's log only because electric logs were not in use in California at the time.

From 1930-1948 a total of 148 wells (8 dry holes) were drilled in the sub-Monterey pools. From 1936-1984, 540 billion cubic feet of gas were injected for gas storage and pressure maintenance. The sub-Monterey pools reached peak production of 135 million cubic feet of gas (MMCFG)/day and 13,950 barrels of oil (BO)/day in 1938. The discovery well for Y Sand; well 47-27N, was excavated into the sub-Monterey formations in 1941. During the 1950s an unknown number of wells were drilled. From 1956 to 59, the In-situ combustion pilot method is employed by in Belridge field. In 1963, the use of cyclic steaming begins. The In-situ combustion project was carried out by Mobil from 1963 to 1968. 1966 was the discovery year for Carneros Sand sub-Monterey formations.

The first successful hydraulicly fractured well was drilled into the Belridge Diatomite in 1977 making these deposits lucrative. In 1979, the shareholders of Belridge Oil Co. approved the merger of their company with Shell Oil Co. In 1986, the use of water injection began to mitigate subsidence (sinking of soils due to the subterranean voids created by oil extraction). In the same year, production peaked at 172,700 BO/day and 114.4 MMCFG/day. From 1987-2007, the Aquifer Lift project was carried out and completed on east flank to reduce aquifer inflow.

The first horizontal wells were drilled in South Belridge in 1993; Shell drilled 46 wells and Mobil drilled 20. The nature of the deposits created too many complications to be profitable so attention was switched to the Diatomite reserves. In 1995, four horizontal wells were drilled into the Diatomite pools and completed by Shell. In 1996, Mobil drilled a horizontal well in the southeast nose of the field. Aera Energy LLC was formed in 1997 from Shell and Mobil assets. At this time, the horizontal well drilling started by Mobil was expanded upon the formation of Aera Energy LLC. The first four wells were technically successful but economic failures. In 2001, the Program

for recompletions and add-pays began. In 2002, production peaks at 76,100 BO/day, 52.9 MMCFG/day. By 2011, the field had 46 active wells. In September of 2022, ExxonMobil and Shell sold Aera Energy to international asset management group IKAV.

Existing Cultural Resources

Methods Used to Identify Known Cultural Resources

To identify cultural resources and characterize the project's potential effects on cultural resources, Stantec completed a cultural resources report for the project, which included a site-wide pedestrian survey, retrieving archival records at the Southern San Joaquin Valley Information Center, California State University, Bakersfield. In addition to the records search and literature review, Stantec conducted a Sacred Lands File Search (SLFS) with the Native American Heritage Commission (NAHC) in West Sacramento. The methodology and results of these efforts are summarized below.

Records Search

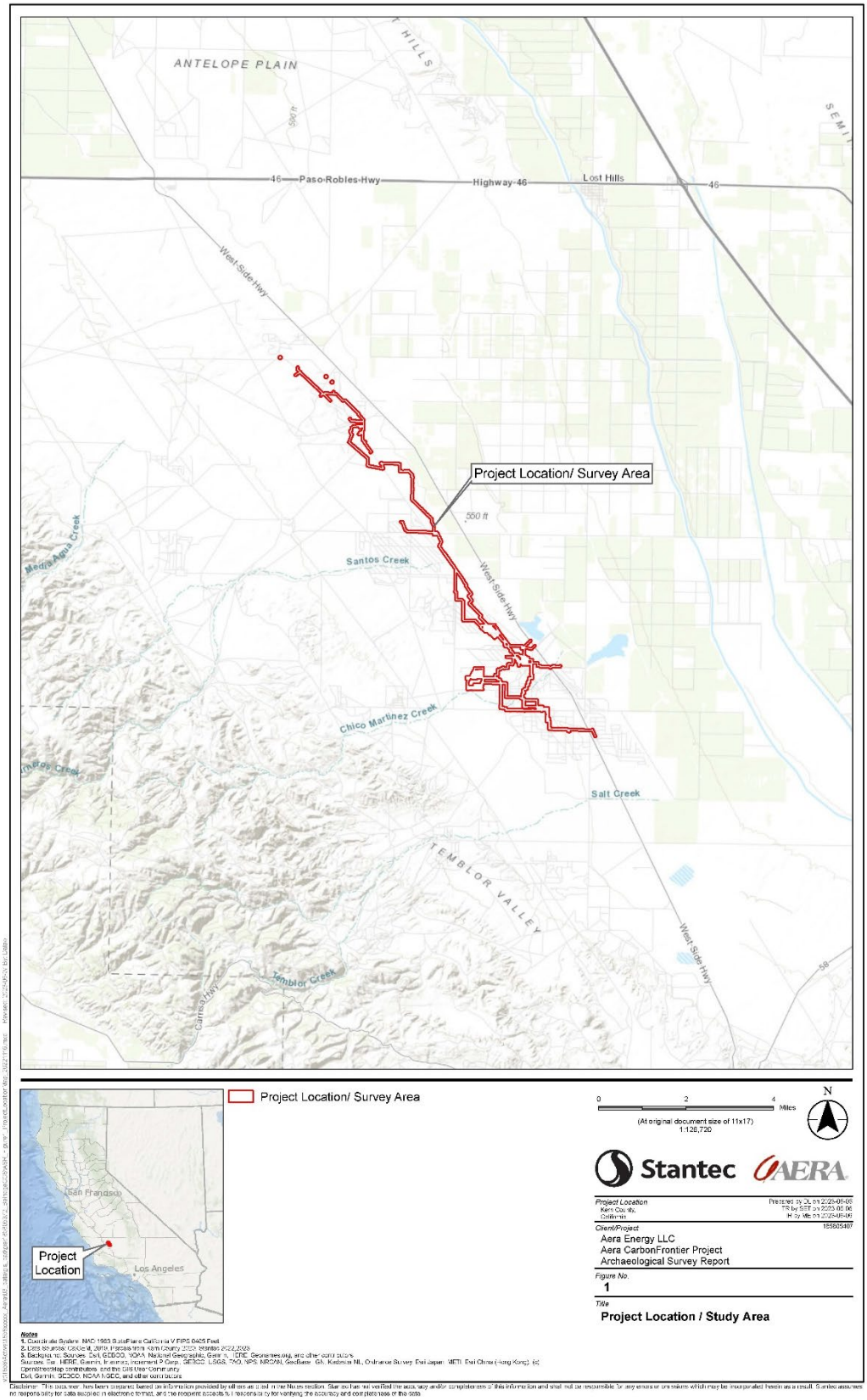
An archival records search was conducted at the Southern San Joaquin Valley Information Center, housed at California State University, Bakersfield, in 2022. The searches included a literature review of all known relevant cultural resource surveys, excavation reports, and site records, to ascertain information on potential cultural resources within the project site plus a 1-mile buffer (project study area). Records examined included archaeological site files and maps, the NRHP, Historic Property Data File, California Inventory of Historic Resources, and the California Points of Historic Interest.

The results of the records search indicate that 17 previous cultural resource surveys were performed within the project study area (Figure 4.5-1) and three previously recorded cultural resources were documented within the project study area.

Nine previous studies were conducted within the project's area of potential effect (APE); however, no resources were previously recorded within the project APE. The three previously recorded resources within the project study area include the following:

- P-15-019637 (Projectile point: crypto crystalline silicate)
- P-15-02116 (Historic brick boiler pad/firebox)
- P-15-02117 (Historic well fractured bricks, oxidated soils, bottle glass fragment, abandoned wells)

Figure 4.5-1: Cultural Resources Project Study Area



To date, few historical California oil industry sites and no California oil industry landscapes have been determined NRHP eligible/significant by the State Historic Preservation Officer (SHPO) or the Bureau of Land Management despite dozens of evaluations, due to lack of integrity and/or research potential. According to a 1997 SHPO assessment of a landscape nomination for the National Petroleum Reserve #1, oilfield landscapes are unlikely to be determined eligible due to the long history of continued use of the oilfields and these sites' resulting lack of integrity. Major discovery wells or industrial remains that represent significant technological innovations are the only potential sites that might be determined eligible, and these are very rare and already recorded.

Stantec revisited the three previously recorded resources for the project study area and performed condition assessments. Below is more detail regarding the three resources.

P-15-019637: The resource is a projectile point made from crypto crystalline silicate and was originally recorded in 2015. The projectile point features middle stage flaking and displays breakage on both the proximal and distal ends and appears to be a Vandenberg Contracting Stem within the larger Coastal Contracting Stem Cluster.

P-15-02116: The site consists of the remains of a historic period brick boiler pad/firebox associated with steam energy production and/or the heating of crude oil. The resource was originally recorded in 1985 and was noted as consisting of a few red fired/glazed bricks within fire affected soil and approximately 12 purple bottle glass fragments.

P-15-02117: The site consists of a large distribution of well fractured red glazed fire bricks and yellow kiln bricks in five separate concentrations, a few purple and blue bottle glass fragments, oxidated soils, and abandoned wells associated with the remains of a large, fired boiler plant and steam operated drilling site. The resource was originally recorded in 1985.

Native American Consultation

Stantec contacted the NAHC on April 19, 2022. The NAHC was requested to conduct a records search from their Sacred Lands File (SLF) for the presence of Native American sacred sites or human remains within the cultural resources study area. On August 23, 2022, the NAHC acknowledged this request was received and Stantec received a response on October 20, 2022, stating that the results were negative (refer to Appendix D-2).

On April 14, 2022, the County of Kern posted letters to tribal contacts, in compliance with California Assembly Bill No.52 (AB 52), requesting their review and comment on the proposed projects' potential impacts on cultural places associated with their tribes. The results of the AB 52 outreach are recorded below, in Table 4.5-1.

Table 4.5-1:Summary of Tribal Consultation

Native American Tribe	Correspondence Attempts	Response
Yuhaaviatam of San Manuel Nation (YSMN, Formerly known as the San Manuel Band of Mission Indians)	Email: 04/14/2022	Thank you for contacting the Yuhaaviatam of San Manuel Nation (formerly known as the San Manuel Band of Mission Indians) regarding the above-referenced project. YSMN appreciates the opportunity to review the project documentation, which was received by the Cultural Resources Management Department on April 13th, 2023. The proposed project is located outside of Serrano ancestral territory and, as such, YSMN will not be requesting to receive consulting party status with the lead agency or to participate in the scoping, development, or review of documents created pursuant to legal and regulatory mandates.
Tejon Indian Tribe	Email: 04/14/2022	No response
Twenty-Nine Palms of Mission Indians	Email: 04/14/2022	No response
Torres Martinez Desert Cahuilla Indians	Email: 04/14/2022	No response

The records searches, supplemental research and consultation did not reveal any known cemeteries or burial sites within the project study area. No Native American sacred sites or human burials are known to be located within the project site boundaries.

Field Survey

A pedestrian survey of the entire approximately 1,167-acre APE (including a 150-foot buffer on either side of the alignment) was conducted. Given the history of the area, Stantec archaeologists anticipated points of historical interest, such as wells, irrigation canal ditches, retaining ponds, old roadways, refuse scatters, historic oil wells and drills (derricks), isolated historic artifacts such as bottles and bricks, and lithic scatters and various isolated artifacts. Stantec archaeologists Mitch Evans, Jeremiah Camp, Joseph Cusack, Fiadh Kelly, Santos Ceniceros-Rodríguez, Santos, and Saeed Sawaed completed the survey. The initial survey was completed in 2022, on May 2 through 5, May 9 through 12, October 3 through 6, and October 25 through 28, 2022. Additional field surveys were completed during February 13-24 and May 5 and 19, 2023.

The survey was conducted by walking parallel transects along the proposed project corridor, spaced approximately 15 to 20 meters apart. Stantec examined surface and subsurface exposures such as rodent burrows and cut banks for physical manifestations of prehistoric and historic cultural constituents.

Surface visibility was good to excellent throughout the APE. Documentation included field notes, photographs, and submeter GPS data collection. The crew followed guidelines and standards specific to survey and recordation within oilfields. Cultural resources were recorded on California Department of Parks and Recreation 523 forms. Two regions in the southeastern extent of the APE measuring 2.8km^2 and 2.7km^2 were surveyed via vehicle due to site-specific conditions (high density of oil pumpjacks/derricks in active operation, restricted access to the Diatomite Thermal Recovery area, and powered equipment in active operation).

The extent of the survey coverage was recorded with Environmental Systems Research Institute Field Maps for ArcGIS and an Arrow Lite GPS receiver with submeter horizontal accuracy utilizing Universal Transverse Mercator (UTM), North American Datum of 1983 (NAD 83), Zone 11, meters, as the spatial reference. Photographs were taken with Apple iPhones and/or iPads to document resources and the environment within the APE and surrounding areas. The extent of the survey coverage is shown on the Belridge, Blackwells Corner, Lost Hills, and Carneros Rocks 7.5-minute USGS topographic quadrangles.

Survey Results

Ground visibility in the APE during survey was good and ranged from 80 to 95 percent. In total, the survey team observed 107 cultural resources within the APE. One hundred-one of the resources are historic period, 80 sites and 21 isolate historic resources. Three of the 107 inventoried resources are prehistoric. One prehistoric site consists of a shell midden, a stone sphere, and chipped stone tools (282103-BN-1A). One multi-component site (272028-BC-1A) was also identified. This site has several prehistoric sandstone discoidal artifacts consistent with Milling Stone Horizon sites dating to 9000BP, and the historic component consists of an assemblage of metal pipelines, valves, various concrete debris, and fencing with braided cord associated with oil well #2-28, as well as anchor hooks and concrete footings used for hoisting and securing a tower derrick.

Seventeen resources are historic wells or sites containing historic wells on multiple historic leases (Belridge, Mannel Minor, J.D. Martin (Texaco), & Shell Oceanic). The wells' years of drilling range from 1907 to 1965 (Table 4.5-2).

Table 4.5-2: Historic Wells Located Within Study Area

Field ID	Type	Location	Description	Township	Section
272026-BC-2A	Site	In survey area	AH10 (Machinery), AH2 (Foundations). Well cellar and wellhead. Well #15. Drilled 1917.	T27S, R20E	26
272027-BC-24A	Site	In survey area	AH4 (Trash/debris scatter). Bricks and amethyst glass. Plugged historic well #21. On 1931 lease but drilled 1942.	T27S, R20E	27
272027-BC-25A	Site	In survey area	AH4 (Trash/debris scatter). Bricks and debris. Plugged well #19. Drilled 1918.	T27S, R20E	27

272027-BC-26A	Site	In survey area	AH2 (Foundations), AH10 (Machinery). Well pad/foundation and wellhead. Well #16. On 1931 lease but drilled 1941.	T27S, R20E	27
272021-BC-1A	Site	In survey area	AH2 (Foundations), AH4 (Debris Scatter). Various wooden structures and oilfield debris. Well #2	T27S, R20E	21
272021-BC-2A	Site	In survey area	Well #22	T27S, R20E	21
272022-BC-1A	Site	In survey area	AH2 (Foundations), AH4 (Debris Scatter), AH5 (Wells/Cisterns), AH6 (Water Conveyance Features), AH10 (Machinery). 3 oil wells and worker quarters with garbage dump	T27S, R20E	22
272027-BC-12A	Site	In survey area	AH16 (Other). Historic well #8-27. Drilled in 1930.	T27S, R20E	27
272027-BC-16A	Site	In survey area	Well #6-27, drilled 1938	T27S, R20E	27
272027-BC-17A	Site	In survey area	Well #7-27, drilled 1937	T27S, R20E	27
272027-BC-18A	Site	In survey area	Well #9-27, drilled 1941	T27S, R20E	27
272028-BC-1A	Site	Not in survey area	AP2 (Lithic Scatter), AH2 (Foundations), AH4 (Debris Scatter), AH10 (Machinery) AH11 (Wall/Fence). Historic oilfield debris, piping, fences; prehistoric Milling Stone Horizon discoidal artifacts and ocher fragments. Well #2-28, drilled 1938	T27S, R20E	28
272028-BC-3A	Site	In survey area	Well #1-28, drilled 1937	T27S, R20E	28
272028-BC-4A	Site	In survey area	Well #16-28, drilled 1939	T27S, R20E	28
272035-BC-7A	Site	In survey area	AH16 (Other). Abandoned well #5. Drilled 1916.	T27S, R20E	35
272035-BC-8A	Site	In survey area	AH16 (Other). Historic well #1. Drilled 1917.	T27S, R20E	35
282001-BC-1A	Site	In survey area	Well #9-1, drilled 1940	T28S, R20E	1
282132-BN-7A	Site	In survey area	AH10 (Machinery). Threaded pipes. Well #363	T21S, R21E	32

4.5.3 Regulatory Setting

Federal

National Historic Preservation Act of 1966

Enacted in 1966, the National Historic Preservation Act (NHPA) declared a national policy of historic preservation and instituted a multifaceted program, administered by the Secretary of the Interior to encourage the achievement of preservation goals at the federal, state, and local levels. The NHPA authorized the expansion and maintenance of the NRHP, established the position of SHPO and provided for the designation of State Review Boards, set up a mechanism to certify local governments to carry out the purposes of the NHPA, assisted Native American tribes to preserve their cultural heritage, and created the Advisory Council on Historic Preservation (ACHP). Section 106 of the NHPA states that federal agencies with direct or indirect jurisdiction over federally funded, assisted, or licensed undertakings must take into account the effect of the undertaking on any historic property that is included in, or eligible for inclusion in, the NRHP and that the ACHP must be afforded an opportunity to comment, through a process outlined in the ACHP regulations at 36 Code of Federal Regulations (CFR) Part 800, on such undertakings.

National Register of Historic Places

As presented in 36 CFR 60.2, the NRHP was established by the NHPA of 1966 as "an authoritative guide to be used by federal, state, and local governments, private groups, and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment." The NRHP recognizes properties that are significant at the national, state, and local levels. To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. A property is eligible for the NRHP if it is significant under one or more of the following criteria:

- **Criterion A:** It is associated with events that have made a significant contribution to the broad patterns of our history.
- **Criterion B:** It is associated with the lives of persons who are significant in our past.
- **Criterion C:** It embodies the distinctive characteristics of a type, period, or method of construction; represents the work of a master; possesses high artistic values; or represents a significant and distinguishable entity whose components may lack individual distinction.
- **Criterion D:** It has yielded, or may be likely to yield, information important in prehistory or history.

Cemeteries, birthplaces, or graves of historic figures; properties owned by religious institutions or used for religious purposes; structures that have been moved from their original locations; reconstructed historic buildings; and properties that are primarily commemorative in nature are not

considered eligible for the NRHP unless they satisfy certain conditions. In general, a resource must be at least 50 years of age to be considered for the NRHP, unless it satisfies a standard of exceptional importance.

State

California Environmental Quality Act

CEQA requires the assessment of a proposed project's effects on cultural resources. Pursuant to CEQA, a "historical resource" is a resource listed in, or eligible for listing in, the CRHR. In addition, resources included in a local register of historic resources or identified as significant in a local survey conducted in accordance with state guidelines are also considered historic resources under CEQA, unless a preponderance of the facts demonstrates otherwise. Properties listed in or formally determined eligible for listing in the NRHP are automatically included in the CRHR. According to CEQA, the fact that a resource is not listed in or determined eligible for listing in the CRHR or is not included in a local register or survey shall not preclude a lead agency, as defined by CEQA, from determining that the resource may be a historical resource as defined in California PRC Section 5024.1. CEQA applies to archaeological resources when (1) the archaeological resource satisfies the definition of a historical resource, or (2) the archaeological resource satisfies the definition of a "unique archaeological resource." A unique archaeological resource is an archaeological artifact, object, or site that has a high probability of meeting any of the following criteria:

- The archaeological resource contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information.
- The archaeological resource has a special and particular quality such as being the oldest of its type or the best available example of its type.
- The archaeological resource is directly associated with a scientifically recognized important prehistoric or historic event or person.

California Register of Historical Resources

Under the California PRC, Section 5024.19(a), the CRHR was created in 1992 and implemented in 1998 as "an authoritative guide in California to be used by State and local agencies, private groups, and citizens to identify the State's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change." Certain properties, including those listed in or formally determined eligible for listing in the NRHP and California Historical Landmarks numbered 770 and higher, are automatically included in the CRHR. Other properties recognized under the California Points of Historical Interest program, identified as significant in historical resources surveys or designated by local landmarks programs, may be nominated for inclusion in the CRHR. A resource, either an individual property or a contributor to a historic district, may be listed in the CRHR if the State Historical Resources Commission (SHRC) determines that it meets one or more of the following criteria, which are modeled on NRHP criteria:

- **Criterion 1.** It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
- **Criterion 2.** It is associated with the lives of persons important in our past.
- **Criterion 3.** It embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of an important creative individual; or possesses high artistic values.
- **Criterion 4.** It has yielded, or may be likely to yield, information important in history or prehistory.

Furthermore, under PRC Section 4852(c), a cultural resource must retain integrity to be considered eligible for the CRHR. Specifically, it must retain sufficient character or appearance to be recognizable as a historical resource and convey reasons of significance. Integrity is evaluated with regard to retention of such factors as location, design, setting, materials, workmanship, feeling, and association. Cultural sites that have been affected by ground disturbing activities, such as grazing and off-road vehicle use (both of which occur within the project site), often lack integrity because they have been directly damaged or removed from their original location, among other changes.

Typically, a prehistoric archaeological site in California is recommended eligible for listing in the CRHR based on its potential to yield information important in prehistory or history (Criterion 4). Important information includes chronological markers such as projectile point styles or obsidian artifacts that can be subjected to dating methods or undisturbed deposits that retain their stratigraphic integrity. Sites such as these have the ability to address research questions.

California Historical Landmarks

California Historical Landmarks (CHLs) are buildings, structures, sites, or places that have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value and that have been determined to have statewide historical significance by meeting at least one of the criteria listed below. The resource also must be approved for designation by the County Board of Supervisors (or the city or town council in whose jurisdiction it is located); be recommended by the SHRC; and be officially designated by the Director of California State Parks. The specific standards now in use were first applied in the designation of CHL #770. CHLs #770 and above are automatically listed in the CRHR.

To be eligible for designation as a landmark, a resource must meet at least one of the following criteria:

- It is the first, last, only, or most significant of its type in the State or within a large geographic region (Northern, Central, or Southern California);
- It is associated with an individual or group having a profound influence on the history of California; or

- It is a prototype of, or an outstanding example of, a period, style, architectural movement or construction or is one of the more notable works or the best surviving work in a region of a pioneer architect, designer, or master builder.

California Points of Historical Interest

California Points of Historical Interest are sites, buildings, features, or events that are of local (city or county) significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. Points of historical interest designated after December 1997 and recommended by the SHRC are also listed in the CRHR. No historic resource may be designated as both a landmark and a point. If a point is later granted status as a landmark, the point designation will be retired. In practice, the point designation program is most often used in localities that do not have a locally enacted cultural heritage or preservation ordinance.

To be eligible for designation as a point of historical interest, a resource must meet at least one of the following criteria:

- It is the first, last, only, or most significant of its type within the local geographic region (city or county);
- It is associated with an individual or group having a profound influence on the history of the local area; or
- It is a prototype of, or an outstanding example of, a period, style, architectural movement or construction or is one of the more notable works or the best surviving work in the local region of a pioneer architect, designer, or master builder.

Native American Heritage Commission

Section 5097.91 of the California PRC established the NAHC, whose duties include the inventory of places of religious or social significance to Native Americans and the identification of known graves and cemeteries of Native Americans on private lands. Section 5097.98 of the PRC specifies a protocol to be followed when the NAHC receives notification of a discovery of Native American human remains from a county coroner.

California Public Records Act

Sections 6254(r) and 6254.10 of the California Public Records Act were enacted to protect archaeological sites from unauthorized excavation, looting, or vandalism. Section 6254(r) explicitly authorizes public agencies to withhold information from the public relating to "Native American graves, cemeteries, and sacred places maintained by the Native American Heritage Commission." Section 6254.10 specifically exempts from disclosure requests for "records that relate to archaeological site information and reports, maintained by, or in the possession of the Department of Parks and Recreation, the SHRC, the State Lands Commission, the NAHC, another

State agency, or a local agency, including the records that the agency obtains through a consultation process between a Native American tribe and a State or local agency."

Health and Safety Code, Sections 7050 and 7052

Health and Safety Code, Section 7050.5, declares that, in the event of the discovery of human remains outside of a dedicated cemetery, all ground disturbance must cease, and the county coroner must be notified. Section 7052 establishes a felony penalty for mutilating, disinterring, or otherwise disturbing human remains, except by relatives.

California Penal Code, Section 622.5

The California Penal Code, Section 622.5, provides misdemeanor penalties for injuring or destroying objects of historic or archaeological interest located on public or private lands, but specifically excludes the landowner.

Public Resources Code, Section 5097.5

PRC, Section 5097.5, defines as a misdemeanor the unauthorized disturbance or removal of archaeological, historic, or paleontological resources located on public lands.

Local

Kern County General Plan

The project site is located within the Kern County General Plan (KCGP) and would therefore be subject to applicable policies and measures of the KCGP. The Land Use, Open Space, and Conservation Element of the KCGP include the following policies and implementation measures related to cultural resources that would apply to the project:

Chapter 1. Land Use, Open Space, and Conservation Element

1.10.3. – Archaeological, Paleontological, Cultural, and Historical Preservation

Policy

Policy 25. The County will promote the preservation of cultural and historic resources that provide ties with the past and constitute a heritage value to residents and visitors.

Implementation Measures

Implementation Measure K. Coordinate with the California State University, Bakersfield's Archaeology Inventory Center.

Implementation Measure L. The County shall address archaeological and historical resources for discretionary projects in accordance with CEQA.

Implementation Measure N. The County shall develop a list of Native American organizations and individuals who desire to be notified of proposed discretionary projects. This notification will be accomplished through the established procedures for discretionary projects and CEQA documents.

Implementation Measure O. On a project-specific basis, the County Planning Department shall evaluate the necessity for the involvement of a qualified Native American monitor for grading or other construction activities on discretionary projects that are subject to a CEQA document.

4.5.4 Impacts and Mitigation Measures

Methodology

This analysis is based on the Cultural Resources Inventory Report prepared by Stantec (Stantec 2023) (included as Appendix D-1 of this EIR). To evaluate the project's potential effects on significant cultural resources, including prehistoric and historic archaeological sites, Stantec Consulting Services, Inc. evaluated the project site, which included a literature review, Native American consultation, and a pedestrian survey for the previously recorded cultural resources within the project study area. Using these resources and professional judgment, impacts were analyzed according to CEQA significance criteria described below.

Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would normally be considered to have a significant impact if it would:

- Cause a substantial adverse change in the significance of a historical or archaeological resource pursuant to CEQA Guidelines Section 15064.5; or
- Disturb any human remains, including those interred outside of formal cemeteries.

Section 21083.2(g) of CEQA further defines "unique archaeological resource" for purposes of determination as to whether a project may have a significant effect on archaeological resources. As used in this section "unique archaeological resource" means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information;
- Has a special and particular quality such as being the oldest of its type or the best available of its type; or
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

According to CEQA Guidelines California Code of Regulations (CCR) Title 14, 15064.5, a project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment (CCR Title 14, 15064.5(b)). The guidelines further state that a substantial adverse change in the significance of a resource means the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historic resource would be materially impaired. Actions that would materially impair the significance of a historical resource are any actions that would demolish or adversely alter those physical characteristics of a historical resource that convey its historical significance and qualify it for inclusion in the CRHR or in a local register or survey that meet the requirements of PRC Sections 5020.1(k) and 5024.1(g).

Project Impacts

Impact 4.5-1: Cause a Substantial Adverse Change in the Significance of a Historical Resource as Defined in Section 15064.5

Of the 107 cultural resources identified within the broader study area, three sites are historically significant discovery wells (272021-BC-1A, 272022-BC-1A, 272027-BC-2A), of which two meet the criteria (Criterion A/1) for listing on the NRHP/CRHP due to the significance of the discovery of oil for the region and the greater implications for the California and United States (see Table 4.5-3). These discovery oil wells sparked the development and expansion of wells within the pool basin areas.

Table 4.5-3: Eligibility Recommendations

Period	ID#	T/S/R	Section	Lat/Long	UTM	NRHP/CRHR Eligibility Justification
Historic – Oil well and potential associated structure (demolished)	272021-BC-1A	T27S, R20E	21	35.559275, -119.816603	244707.79 mE / 3938718.30 mN	Criterion A/1. Site represents oil extraction infrastructure for the 1930s. Well #2 of the Tidewater Associated Oil Company, associated with the expansion of oil extraction in response to adjacent discovery well (272022-BC-1A).
Historic – Oil well and encampment	272022-BC-1A	T27S, R20E	22	35.559641, -119.813536	244987 mE/ 3938751 mN	Criterion A, D/1, 4. Belridge-A #1 discovery well, oil workers camp debris
Historic – A domestic water line and a	272027-BC-2A	T27S, R20E	27	35.544500, -119.798917	246264.64 mE / 3937033.28 mN	Criterion A/1. Historic site discovery well. It's well #64-27, 1800s land grant, 1930s well operation.

The two sites were identified as eligible for either NRHP or CRHR, 272021-BC-1A, 272027-BA-2A, making them historical resources under CEQA. Of the two eligible sites, however, only one 27027-BC-2A, is located within the project APE. If this site were disturbed by the project, it might cause a substantial adverse change that then would constitute a significant impact to a historical resource. Therefore, the project may have a potentially significant impact on this eligible historic resource.

In the event that unknown archaeological resources that qualify as historical resources are discovered during project construction, and these resources are disturbed, that disturbance may cause an adverse effect that would result in a potentially significant impacts. Mitigation Measure (MM) 4.5-1, listed and described below, would require cultural resources surveys, preservation of resources, and sensitivity training for construction workers, would reduce any potential impacts to the one existing known resource within the APE and any unknown resources that may be inadvertently discovered. Potential impacts to existing archaeological sites as well as unknown archaeological resources that could qualify as significant historical resources, would be mitigated to less than significant through the implementation of MM 4.5-1.

Mitigation Measures

MM 4.5-1 The following are requirements for any and all grading and construction activities on all project components with defined ground disturbance, including all injection wells, abandonment of wells, capture facilities and pipelines. The remaining carbon capture and storage (CCS) Surface Land Area that is within the project boundary but has no construction or disturbance is not subject to this requirement.

a. The owner/operator shall demonstrate whether the project site has been previously surveyed for cultural resources. The owner/operator may rely on a previously performed ground surface survey for subsequent ground disturbing activities. If the project site has not been previously surveyed based on the records search information, an intensive (100%) pedestrian ground surface survey (Phase I survey/Class III inventory) by qualified archaeologists shall be required. If no cultural resources have been recorded, then no further cultural resources studies shall be required.

b. All prehistoric/Native American archaeological sites, whether identified during the records searches or during the intensive survey, shall be demarcated by a qualified archaeologist, fenced by the owner/operator, and preserved in place.

c. Should it be determined that preservation in place is not achievable, then historical (Euro-American) archaeological sites that are potentially eligible for listing in the National Register of Historic Places and/or California Register of Historical Resources shall be evaluated by a qualified archaeologist or historian and must meet the requirements of the National Historic Preservation Act of 1966 and/or California Public Resources Code (PRC) 5024.1; 14 CCR Section 15064.5[a][3] in order to qualify.

Qualifying sites, structures and equipment that are identified during the records search or field survey shall be fenced and preserved in open space, removed and curated, or treated using data recovery procedures that follow the guidelines of the Secretary of the Interiors Standards for Architectural and Engineering Documentation.

d. Historical (Euro-American) archaeological site types relating to oil and gas activities that have been determined Not Significant/Unique shall require no archaeological study or treatment.

e. All employees conducting work in the area identified on the CCS final design plans shall complete Worker Environmental Awareness Program training including training dedicated to cultural resources protection.

f. Qualified Native American Tribal monitors shall be retained from a Kern County Federally recognized tribe for all construction activities. The Tribe may elect to delegate this employment to other Tribes in the area. All monitors must have completed safety training for oilfield worker as well as the Worker Environmental Awareness Program. Written documentation from the Tribe on the monitors and completed training shall be provided to the Kern County Planning and Natural Resources Department.

Level of Significance after Mitigation

Impacts would be less than significant after mitigation.

Impact 4.5-2: Cause a Substantial Adverse Change in the Significance of an Archaeological Resource as Defined in Section 15064.5

As discussed above under Impact 4.5-1, 107 cultural resources were identified within the project area. Two of the prehistoric archaeological sites (272028-BC-1A and 282103-BN-1A) are eligible for listing in the NRHP/CRHP and are located within the APE, as such, are considered historical resources under CEQA. The prehistoric component of resources 282103-BN-1A and 272028-BC-1A contain evidence for considerable antiquity and have the potential to yield information important in prehistory of the region and the greater California. The cultural constituents at these two prehistoric sites have the potential to yield information on chronology, technology, exchange, and subsistence and settlement patterns within the San Joaquin Valley region, and therefore, these sites are recommended eligible under Criterion D/4. The remaining resources were inventoried and evaluated, but based on recommendations provided by the Bureau of Land Management but do not appear NRHP/CRHR eligible.

Any adverse changes to the significance of archaeological resources resulting from project construction or operation would constitute a significant impact on the environment. As discussed under Impact 4.5-1, there also is a potential for the project to impact previously unknown, buried archaeological deposits. However, with implementation of MM 4.5-1 and MM 4.5-2, which require several measures to avoid, protect, and monitor any cultural resources, including archaeological sites , potential impacts would be reduced to less than significant.

Mitigation Measures

In addition to MM 4.5-1 previously identified, MM 4.5-2 would be incorporated.

MM 4.5-2 In the event archaeological materials are encountered during the course of ground disturbance or construction, the project operator/contractor shall cease any ground disturbing activities within 500 feet of the find or as needed to preserve the site. The qualified archaeologist shall evaluate the significance of the resources and recommend treatment measures. Per California Environmental Quality Act (CEQA) Guidelines Section 15126.4(b)(3), project redesign and preservation in place shall be the preferred means to avoid impacts to significant historical resources. Consistent with CEQA Guidelines Section 15126.4(b)(3)(C), if it is demonstrated that resources cannot be avoided, the qualified archaeologist shall develop additional treatment measures in consultation with the County, which may include data recover or other measures. The Planning and Natural Resources Department shall consult with Native American representatives in determining treatment for unearthed cultural resources if the resources are prehistoric or Native American in nature. If after consultation it is determined that archaeological materials are to be recovered, then they shall be curated at an accredited curation facility. The qualified archaeologist shall prepare a report documenting evaluation and/or additional treatment of the resource. A copy of the report shall be provided to the Kern County Planning and Natural Resources Department and to the southern SJV Information Center.

Level of Significance after Mitigation

With implementation of MM 4.5-1 and MM 4.5-2, impacts would be less than significant.

Impact 4.5-3: Disturb any Human Remains, including those Interred Outside of Formal Cemeteries

Buried human remains that were not identified during field surveys could be inadvertently unearthed during excavation activities, which could damage these human remains, and could result in a potentially significant impact. Therefore, MM 4.5-3 contains procedures for recording and treating any human remains that are discovered during construction of the project. MM 4.5-3 requires that these items be protected, preserved and treated in accordance with applicable laws, regulations and guidelines.

Mitigation Measures

MM 4.5-3 If human remains are uncovered during project construction, the owner/operator shall immediately halt all work on the site, contact the Kern County Coroner to evaluate the remains, and follow the procedures and protocols set forth in Section 15064.5 (e)(1) of the CEQA Guidelines. The Kern County Planning and Natural Resources Department shall be notified concurrently. If the County Coroner determines that the remains are Native American, the project proponent shall

contact the NAHC, in accordance with Health and Safety Code Section 7050.5, subdivision (c), and Public Resources Code 5097.98 (as amended by Assembly Bill 2641). The NAHC shall designate a Most Likely Descendant for the remains per Public Resources Code 5097.98. Per Public Resources Code 5097.98, the owner/operator, in coordination with the landowner, shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located, is not damaged or disturbed by further development activity until the discussion and conference with the Most Likely Descendant has occurred, if applicable, taking into account the possibility of multiple human remains. If the remains are determined to be neither of forensic value to the Coroner, nor of Native American origin, provisions of the California Health and Safety Code (7100 et. seq.) directing identification of the next-of-kin will apply. In the event human remains are uncovered, the surface owner shall be notified immediately.

Level of Significance after Mitigation

Impacts would be less than significant.

4.5.5 Cumulative Setting, Impacts, and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present, and reasonably foreseeable future oil and gas development, including wells and abandonment activity to implement carbon capture and storage projects, constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; an Supplemental Recirculated Environmental Impact Report (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The aforementioned documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells per year county wide of various types (production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 other wells

(cyclic wells, Senate Bill [SB] 4 Activities, plugged and abandoned) per year (Page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for 8 years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. California Geologic Energy Management Division permitting for all wells with the exception of plugging and abandonments has never averaged over 2,000 permits a year (as implementation in some years of the Kern County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts to cultural resources is considered the Belridge oilfield. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects*, would have on cultural resources. This geographic scope of analysis is appropriate because the archaeological, historical, and paleontological resources within this area are expected to be similar to those in the project site because of their proximity; similar environments, landforms, and hydrology would result in similar land use—and thus, site types.

Impact 4.5-4: Contribute to Cumulative Cultural Resources Impacts

With regard to impacts to significant cultural resources, the project has the potential to contribute significantly to cumulative impacts to cultural resources within the region. A complete analysis of the cumulative impacts of the various ground disturbing activities from oil and gas are provided in Section 4.5, *Cultural and Paleontological Resources* of the Kern County Oil and Gas EIR. Through implementation of MM 4.5-1 through MM 4.5-3, impacts known and inadvertently discovered cultural resources, including historic, prehistoric, archaeological, and tribal sites would be avoided entirely or mitigated to ensure potential impacts are reduced to a less than significant level, if feasible. If a significant archaeological resource cannot be avoided, MM 4.5-1 would ensure that significant impacts are reduced by testing or data recovery.

There is potential for unanticipated and previously unidentified cultural resources, and if discovered, the project would implement MM 4.5-1 and MM 4.5-3 to monitor construction and treat newly discovered sites, thus reducing the project impacts. In addition, the other projects identified in Section 3.9, *Cumulative Projects*, would also be expected to have Mitigation Measures that would reduce potential impacts on archaeological resources. Federally licensed projects require compliance with Section 106 of the NHPA to consider and resolve adverse effects to significant cultural resources. Likewise, compliance with CEQA for all projects would be expected to reduce impacts on archaeological resources; however, because archaeological resources are non-renewable and each resource contributes important information about prehistory, mitigative data recovery in itself can be destructive. Although a portion of an archaeological resources site can be salvaged, which may reduce impacts, those impacts to that resource would remain significant. Implementation of MM 4.5-1 would reduce significant impacts to archaeological resources, but uncertainty remain. Regarding the potential to disturb human remains, the project could contribute significantly to cumulative impacts within the region. Although no human remains have been identified within the project site, to date, there is potential for their discovery during project

construction. If human remains were to be discovered during construction, MM 4.5-1 would ensure that the remains are treated in accordance with the California PRC and would not represent a significant unmitigable impact. The potential impacts of the other cumulative projects identified in Chapter 3 Section 3.10, *Cumulative Projects*, would also be expected to be reduced by compliance with the Public Resources Codes.

Implementation of best professional practices would reduce many impacts to a less than significant level. However, given the depths needed for the Underground Injection Control Class IV injection wells, the potential for destruction of unknown cultural resources is possible. Given the size and scope of oil and gas activities in the unincorporated area, and the impacts of this project at depths where cultural resources cannot be assessed cumulative impacts to cultural resources are significant and unavoidable with all feasible and reasonable mitigation for MM 4.5-1 through MM 4.5-3.

Mitigation Measures

Implement MM 4.5-1 through MM 4.5-3.

Level of Significance after Mitigation

Cumulative impacts would be significant and unavoidable.

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Section 4.6

Energy

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Section 4.6

Energy

4.6.1 Introduction

This section of the Environmental Impact Report (EIR) describes the affected environment and regulatory setting regarding energy. It also evaluates existing energy conditions in the project area and analyzes the impacts on energy levels that would result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers) southwest of the community of Lost Hills and west of State Route (SR) 33."

Information contained within this section is based in part on the Energy Utilization Study prepared by Stantec Consulting Services Inc. (Stantec 2023) and is included as Appendix K-1 of this EIR.

A description of the environmental setting (affected environment) for energy is presented in Section 4.6.2, *Environmental Setting*. The regulatory setting applicable to energy-related impacts are presented in Section 4.6.3, *Regulatory Setting*, and Section 4.6.4, *Impacts and Mitigation Measures,* discusses project impacts and associated mitigation measures.

4.6.2 Environmental Setting

The project site is located within the Central Valley portion of unincorporated Kern County and is comprised of forty-five parcels within the administrative boundaries of the Belridge oilfields. The Belridge oilfields are contiguous and located west of SR 33, approximately 7 miles southwest of the community of Lost Hills (population 2,370). Together, the two Belridge oilfields cover an area of approximately 13 miles long and 3 miles wide. Aera Energy is the primary operator within both oilfields.

Pacific Gas and Electric (PG&E) provides natural gas and electric service to approximately 16 million people throughout a 70,000-square-mile service area in northern and central California, including Kern County. In February 2018, PG&E announced that it had reached California's 2020 renewable energy goal three years ahead of schedule. In 2021, approximately 48 percent of PG&E's electricity came from renewable resources including solar, wind, geothermal, biomass and small hydroelectric sources. Additionally, approximately 91 percent of PG&E's total electric power mix is from greenhouse gas-free sources, which includes nuclear and large hydroelectric sources of energy.

The California Energy Commission (CEC) tracks electricity and natural gas consumption across the state for residential and non-residential sources. In 2021, Kern County used a total of 15,009 Gigawatt hours (GWh) of electricity and 1,866 million therms of natural gas. Approximately 82 percent of the electricity usage and 95 percent of the natural gas use in the County came from non-residential sources.

The South Belridge oilfield is powered by the Co-Generation (Cogen) Plant 32, constructed from 1985 to 1986, via Aera Energy's existing substations and electrical grid system. Cogen 32 is composed of three turbine-driven generator sets, each able to make 20 megawatts (MW) of power. The Cogen 32's output is backed up with a connection to PG&E if any or all of the three Cogen 32 turbines are down for maintenance or temporary outage. The project would pull available power from Cogen 32 within its existing capacity, and any additional electrical load would be provided by PG&E.

4.6.3 Regulatory Setting

Federal

Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission is an independent agency that regulates the interstate transmission of electricity, natural gas, and oil. The Federal Energy Regulatory Commission also reviews proposals to build liquefied natural gas terminals and interstate natural gas pipelines as well as licensing hydropower projects. Licensing of hydroelectric facilities under the authority of the Federal Energy Regulatory Commission includes input from state and federal energy and power generation, environmental protection, fish and wildlife, and water quality agencies.

National Energy Conservation Policy Act

The National Energy Conservation Policy Act (42 U.S. Code [U.S.C] §8201 et seq.) serves as the underlying authority for federal energy management goals and requirements and is the foundation of most federal energy requirements. The National Energy Conservation Policy Act also established fuel economy standards for on-road motor vehicles in the United States. The National Highway Traffic Safety Administration (NHTSA) is responsible for establishing additional vehicle standards and for revising existing standards. NHTSA and the U.S. Environmental Protection Agency (EPA) are taking coordinated steps to enable the production of clean energy vehicles with improved fuel efficiency. NHTSA sets the Corporate Average Fuel Economy (CAFE) levels, which are rapidly increasing over the next several years to improve energy security and reduce fuel consumption. In March 2022, the NHTSA finalized CAFE standards for model years 2024 to 2026. The standards require an industry-wide fleet average of approximately 49 miles per gallon for passenger cars and light trucks by model year 2026. The NHTSA projects that the foregoing standards will avoid the consumption of approximately 234 billion gallons of gasoline between model years 2030 to 2050 (NHTSA 2022).

Energy Independence and Security Act of 2007

The Energy Independence and Security Act (EISA) aimed to increase U.S. energy security, increased CAFE standards for motor vehicles, and included provisions related to energy efficiency, such as renewable fuel standards (RFS), appliance and lighting efficiency standards; and building energy efficiency standards. The EISA required increasing levels of renewable fuels to replace petroleum. The EPA is responsible for developing and implementing regulations to ensure transportation fuel sold into the United States contains a minimum volume of renewable fuel.

The RFS programs regulations were developed in collaboration with refiners, renewable fuel products, and other stakeholders and were created under the Energy Policy Act of 2005. The RFS program established the first renewable fuel volume mandate in the United States. As required under the EISA, the original RFS program required 7.5 billion gallons of renewable fuel to be blended into gasoline by 2012. The RFS program was expanded in several ways that laid the foundation for achieving significant reductions of greenhouse gas (GHG) emissions using renewable fuels, for reducing imported petroleum, and for encouraging the development and expansion of the nation's renewable fuels sector. The updated program is referred to as RFS2 and includes the following:

- EISA expanded the RFS program to include diesel in addition to gasoline
- EISA increased the volume of renewable fuel required to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons by 2022
- EISA established new categories of renewable fuel and set separate volume requirements for each one
- EISA is required by the EPA to apply life cycle GHG performance threshold standards to ensure that each category of renewable fuel emits fewer GHGs than the petroleum fuel it replaces

Additional provisions of the EISA address energy savings in government and public institutions, promoting research for alternate energy, additional research in carbon capture, international energy programs, and the creation of "green jobs."

Federal Vehicle Standards

The Energy Policy and Conservation Act of 1975 (EPCA) mandated that the NHTSA establish and implement a regulatory program for motor vehicle fuel economy, known as the CAFE program, to reduce national energy consumption. As codified in Chapter 329 of Title 49 of the U.S.C, as amended by the EISA, EPCA sets forth specific requirements concerning the establishment of average fuel economy standards for passenger cars and light trucks. The EISA, discussed above, amended the EPCA CAFE program requirements by providing the Department of Transportation additional rulemaking authority and responsibilities.

Consistent with its statutory authority in rulemaking to establish CAFE standards for model year 2017 and beyond, NHTSA developed two phases of standards. The first phase included final standards for model years 2017–2021. The second phase, covering model years 2022–2025, included standards that were not final, due to the statutory requirement that NHTSA set average fuel economy standards not more than five model years at a time. Rather, NHTSA wrote that those standards were augural, meaning that they represented its best estimate, based on the information available at that time, of what levels of stringency might be maximum feasible in those model years. In 2012, the agencies jointly adopted more stringent Phase 2 standards for light duty cars and trucks, which would cover model years 2017 through 2025. In August of 2016, the agencies adopted more stringent Phase 2 standards for medium- and heavy-duty vehicles, which would cover model years

2018 through 2027 for certain trailers and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks.

On March 31, 2020, NHTSA and the EPA released a new rule, the final Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule, setting CAFE and carbon dioxide emissions standards for model years 2021 through 2026 passenger cars and light trucks. The rule rolls back the 2012 standards for model years 2021 through 2026 for passenger cars and light trucks, which had required an average fleetwide fuel economy equivalent of 54.5 miles per gallon in model year 2025 with a 5 percent annual increase to an average fuel economy of about 40 miles per gallon in model year 2025 with annual increases of 1.5 percent starting in 2021. As a part of issuing the new SAFE rule, NHTSA issued a Final Environmental Impact Statement which found that the relaxed standards would result in increased petroleum consumption which in turn would result in increases to GHG and criteria pollutant emissions known to contribute to adverse health impacts. The estimated increases from the roll back of the 2012 standards are expected to result in more than a billion metric tons additional climate pollution through 2040 as determined by calculating the difference from the reduction of 2 billion metric tons the 2012 rule was expected to accomplish compared to the standards of the 2020 rule (NHTSA 2020).

On January 20, 2021, an Executive Order was issued on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, which includes review of the Part One Rule by April 2021 and review of the Part Two Rule by July 2021. In response to the Part One Rule, in December 2021, the Department of Transportation withdrew its portions of the SAFE rule. As a result, states are now allowed to issue their own GHG emissions standards and zero-emissions vehicle mandates. In addition, the Part Two Rule was adopted to revise the existing national GHG emission standards for passenger cars and light trucks through model year 2026. These standards are the strongest vehicle emissions standards ever established for the light-duty vehicle sector and will result in avoiding more than three billion tons of GHG emissions through 2050.

Inflation Reduction Act of 2022

The Inflation Reduction Act (IRA) of 2022 is considered the most ambitious climate law in U.S. history, and is intended to reduce GHG emissions, help build a clean economy, reduce energy costs for Americans, and advance environmental justice. With funding from the IRA, the EPA has launched a network of clean energy financing and provided grant funding for climate pollution reduction programs. The IRA increases the 45Q tax credit to $85 per ton for geologic sequestration of CO_2 from industrial sources.

State

California Public Utilities Commission

The California Public Utilities Commission (CPUC) is a state agency created by a constitutional amendment to regulate privately-owned utilities providing telecommunications, electric, natural gas, water, railroad, rail transit, and passenger transportation services and in-state moving companies. The CPUC is responsible for ensuring that California utility customers have safe, reliable utility services at reasonable rates, while protecting utility customers from fraud. The

CPUC regulates the planning and approval for the physical construction of electric generation, transmission, or distribution facilities, and local distribution pipelines of natural gas.

California Energy Code

Compliance with the California Energy Code (CCR Title 24, Part 6, California's Energy Efficiency Standards) and Title 20, Public Utilities and Energy, standards must occur for all new buildings constructed in California. These efficiency standards apply to new construction of both residential and non-residential (maintenance buildings and pump station buildings associated with the program) buildings, and they regulate energy consumed for heating, cooling, ventilation, water heating, and lighting. The building efficiency standards are enforced through the local building permit processes, and local government agencies may adopt and enforce energy standards for new buildings provided that these standards meet or exceed those provided in the Title 24 guidelines.

Warren-Alquist Energy Resources Conservation and Development Act

Initially passed in 1974 and amended since, the Warren-Alquist Energy Resources Conservation and Development Act (Warren-Alquist Act) created the CEC, California's primary energy and planning agency. The seven responsibilities of the CEC are forecasting future energy needs, promoting energy efficiency and conservation through setting standards, supporting energy-related research, developing renewable energy resources, advancing alternative and renewable transportation fuels and technologies, certifying thermal power plants 50 MW or larger, and planning for and directing state response to energy emergencies. The CEC regulates energy resources by encouraging and coordinating research into energy supply and demand problems to reduce the rate of growth of energy consumption. Additionally, the Warren-Alquist Act acknowledges the need for renewable energy resources and encourages the CEC to explore renewable energy options that would be in line with environmental and public safety goals (Public Resources Code Section 25000 et seq.).

California Integrated Energy Policy

Senate Bill (SB) 1389 requires the CEC to "conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices. The Energy Commission shall use these assessments and forecasts to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety." The CEC adopts an Integrated Energy Policy Report every two years and an update every other year. The most recent version is the 2022 Integrated Energy Policy Report Update.

California Renewable Portfolio Standard

California's Renewables Portfolio Standard (RPS) was initially established in 2002 by SB 1078, with the initial requirement that 20 percent of electricity retail sales be served by renewable resources by 2017. The program was accelerated in 2006 under SB 107, which required that the 20 percent mandate be met by 2010. In April 2011, SB 2 was signed into law, requiring electricity retailers in the state to procure 33 percent of their energy sources from renewable energy sources

by the end of 2020. In addition, SB 350, passed in 2015, directs California utilities to further increase the amount of renewable energy delivered to customers to 50 percent by 2030.

CPUC implements and administers RPS compliance rules for California's retail sellers of electricity, which include large and small investor-owned utilities, publicly owned utilities, electric service providers, and community choice aggregators. The CEC is responsible for the certification of electrical generation facilities as eligible renewable energy resources and adopting regulations for the enforcement of RPS procurement requirements of public owned utilities.

Low Carbon Fuel Standard

In 2007, Executive Order S-01-07 established the Low Carbon Fuel Standard (LCFS) and directed the Secretary for Environmental Protection to coordinate the actions of the CEC, the California Air Resources Board (CARB), the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. CARB adopted the LCFS on April 23, 2009.

The LCFS was subject to legal challenge in 2011. Ultimately, CARB was required to bring a new LCFS regulation for consideration in February 2015. The proposed LCFS regulation was required to contain revisions to the 2010 LCFS and new provisions designed to foster investments in the production of the low-carbon fuels, offer additional flexibility to regulated parties, update critical technical information, simplify and streamline program operations, and enhance enforcement. The regulation was last amended in 2018. The 2018 amendments strengthen the carbon intensive fuel reduction targets beyond 2020 to support the climate goals established in SB 32. Other major changes to the 2018 amendments include expanding the fuel types and eligible activities to participate in the LCFS. One of the specific regulations added in 2018 is the Carbon Capture and Sequestration Protocol under the LCFS. The Carbon Capture and Sequestration Protocol establishes methodology for quantifying geological CO_2 sequestration, and permanence requirements related to site characteristics, plume extent evaluation, testing and monitoring, well operation, post-injection site care, and more.

2022 Scoping Plan for Achieving Carbon Neutrality

The 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan) was approved by the CARB in December 2022 and assesses progress toward achieving the state's GHG reduction goals and establishes a path to achieve carbon neutrality no later than 2045. The 2022 Scoping Plan focuses on outcomes needed to achieve carbon neutrality by assessing paths for advancing transportation technology, clean energy deployment, maintenance and preservation of natural and working lands, and others, and is designed to meet the State's long-term climate objectives. Specifically, the 2022 Scoping Plan identifies carbon negative technologies, including nature-based and mechanical carbon sequestration projects, as an essential component in achieving state-wide carbon neutrality.

Local

Kern County General Plan

The project area is located within the Kern County General Plan (KCGP) area and, therefore, would be subject to applicable policies and measures of the KCGP. The Energy Element of the KCGP include goals, policies, and implementation measures related to energy that apply to the project, as described below.

Chapter 5. Energy Element

5.2 Importance of Energy to Kern County

Goal. To assert Kern County's position as California's leading energy producer, to encourage safe and orderly energy development within the County, including research and demonstration projects, and to become actively involved in the decisions and actions of other agencies as they affect energy development in Kern County.

Policies

Policy 1. Kern County should assert and promote its role as the State's leading energy County.

Policy 4. The County should actively seek State and federal energy grants and projects to assist in energy planning and development.

Policy 5. The County shall work with other agencies to define regulatory responsibility concerning energy-related issues, and shall seek to eliminate, insofar as possible, duplicative regulations.

Policy 6. The County should encourage discussion and mutual cooperation of various energy industries within the County to establish mutual understanding of common needs and issues.

Policy 7. The processing of all discretionary energy project proposals shall comply with California Environmental Quality Act (CEQA) Guidelines directing that the environmental effects of a project must be taken into account as part of project consideration.

Policy 8. The County should work closely with local, State, and federal agencies to assure that energy projects (both discretionary and ministerial) avoid or minimize direct impacts to fish, wildlife, and botanical resources, wherever practical.

Policy 9. The County should develop and implement measures which result in long-term compensation for wildlife habitat, which is unavoidably damaged by energy exploration and development activities.

5.3.2 Kern County's Economic Dependence on the Oil Market

Goal. To reduce the County's susceptibility to fluctuations in the petroleum production levels, and to encourage diversification of the economy.

Policies

Policy 3. The County shall encourage the conversion of existing petroleum-related facilities to other productive uses when they are no longer needed or productive.

5.3.5 Reuse of Nonproductive Petroleum Resource Areas

Goal. To ensure the proper abandonment of petroleum production operations, in accordance with DOGGR requirements, when petroleum resource areas are depleted or are no longer productive, to provide for conversion of these areas to other land uses.

Policies

Policy 1. The County shall promote safe well abandonment in accordance with DOGGR regulations through discretionary applications.

Policy 2. The County shall work with the DOGGR to ensure the removal of all surface equipment from abandoned petroleum development sites.

Policy 3. The County shall promote and encourage the safe reuse of former petroleum production lands by developments compatible with surrounding land use designations. The guidelines for site reestablishment include the following:

a. Removal of oil-laden soil
b. Shaping of disturbed lands back to natural grade and the elimination of pad areas, settling ponds, and similar disturbances.
c. Stabilization of sites by seedlings and plantings as appropriate.
d. Other measures as may be stipulated by the State Division of Oil, Gas and Geothermal Resources.
e. Proper identification and abandonment of all oil and natural gas wells.

4.6.4 Impacts and Mitigation Measures

This section describes the methodology used in conducting the CEQA impact analysis for energy; the thresholds of significance used in assessing impacts to energy; and the assessment of impacts to energy, including relevant mitigation measures.

Methodology

The analysis presented herein is based on the Energy Utilization Study prepared for the project (Stantec 2023) and additional information provided by the applicant (Stantec 2024). A full copy of the report is provided in Appendix B-2 of this EIR. Project energy demand during construction and operations was determined based on project-specific information and using vehicle and equipment emission factors from the CARB's EMFAC2021 (v1.0.2) model (EMFAC is short for EMission FACtor) and EMFAC OFFROAD2021 (v1.0.4).

Construction

Project construction would require various tasks including facility pad grading, well drilling, pipeline construction, and others. Table 4.6-1 shows the anticipated construction components and timing per component. There will be two types of re-abandonments, based on the scope of work to be performed – type A and type B. Type A re-abandonments will entail standard activities that can be performed with a workover rig and last approximately 19 days/well, while Type B re-abandonments will require a drilling rig to remove existing cement and casing from legacy wells and will last roughly 35 days/well.

Table 4.6-1: Project Construction Components

Project Component	Construction Days Per Component
Facilities Pad Grading	80
Repurposed Injection Well Site Preparation	20
Repurposed Injection Well Drilling	100
Repurposed Monitoring Well Site Preparation	26
Repurposed Monitoring Well Drilling[1]	80
New Well Site Preparation	40
New Well Drilling	60
CO_2 Capture Facilities (4 facilities)	522 days per facility
Type A Well Re-abandonments (6 sites)	19
Type B Well Re-abandonments (26 sites)	35
Compressor Station Construction	80
CO_2 Main Pipeline	390
Distribution Pipelines	260
Electrical Transmission Line	60
Intra-Field Electrical Distribution	60
Onsite Electrical Substations	130
Water Pipelines	87
Natural Gas Pipelines	120
Steam Pipeline	88
Demolition	40
On-site Roads	15-20 Per Well

Notes:
The well Hookup phase timing and equipment is included within the "Well Drilling" phases.

Construction of the components would overlap, and several components would begin construction at the same time. Construction of most components is anticipated to begin in 2025, except construction of the intra-field electrical distribution system would begin in 2026. The most time-consuming component, construction of the CO_2 capture facilities, is expected to finish in 2028.

For this analysis, all construction activity was assumed to occur in the year 2025, except intra-field electrical distribution, which was assumed to occur in 2026. The construction schedule utilized in

the analysis represents a "worst-case" analysis scenario because fuel efficiency for construction equipment increases as the analysis year increases, due to improvements in technology and more stringent regulatory requirements. Therefore, the construction energy demand would be less if the construction schedule is adjusted to occur in later years.

Off Road Equipment

The off-road equipment fleet and associated horsepower per piece of equipment for each project component was provided by Aera Energy. Consistent with the air quality and GHG emissions modeling, each piece of equipment was assumed to be in use for 8 hours per day, with the exception of drill rigs, which were assumed to operate for 24 hours per day. Off-road equipment energy demand was estimated based on the equipment usage (horsepower-hours) and fuel efficiency (gallons/horsepower-hour), as provided by the EMFAC OFFROAD2021 database. Table 4.6-2 provides a summary of the construction-related vehicle trips.

Table 4.6-2: Project Construction Components

Project Component	Work Trips Per Day	Vendor Trips Per Day	Heavy-Duty Truck Trips Per Day
Facilities Pad Grading	30	9	0
Repurposed Injection Well Site Preparation	28	9	0
Repurposed Injection Well Drilling	34	10	0
Repurposed Monitoring Well Site Preparation	28	9	0
Repurposed Monitoring Well Drilling	34	10	0
New Well Site Preparation	28	9	0
New Well Drilling	34	10	0
Type A Well Re-abandonments (6 sites)	34	10	0
Type B Well Re-abandonments (26 sites)	34	10	0
CO_2 Capture Facilities (four facilities)	192	56	0
Compressor Station Construction	56	22	0
CO_2 Main Pipeline	58	20	2
Distribution Pipelines	46	17	2
Electrical Transmission Line	24	12	1
Intra-Field Electrical Distribution	24	12	1
Onsite Electrical Substations	36	10	0

Table 4.6-2: Project Construction Components

Project Component	Work Trips Per Day	Vendor Trips Per Day	Heavy-Duty Truck Trips Per Day
Water Pipelines	40	16	2
Natural Gas Pipelines	40	16	2
Steam Pipeline	40	16	2
Demolition	24	8	0
On-site Roads	16	5	0

The number of daily worker trips were based on Aera Energy's estimate of the average number of daily workers required for each project component, and assuming two one-way trips per worker per day. Consistent with the air quality and GHG emissions modeling, the worker trip length was estimated at 45 miles per one-way trip. The fleet mix for worker trips was composed of a mixture of passenger cars, light-duty trucks, and medium-duty vehicles.

The number of daily vendor trips were estimated as 0.4 vendor trips per construction worker, in addition to the on-road vehicles that were included in Aera Energy's provided construction equipment list (for example, flatbed trucks, mechanic trucks, SUVs). Consistent with the air quality and GHG emissions modeling, the vendor trip length was estimated at 45 miles per one-way trip. The fleet mix for vendor trips was composed of a mixture of light heavy-duty trucks, medium heavy-duty trucks, and heavy heavy-duty trucks.

The number of heavy-duty truck trips were based on information provided by Aera Energy. The trip length was assumed to be 45 miles, and the fleet mix was composed entirely of heavy-duty trucks.

Operation

Operational energy use refers to the energy demand that would occur during operation of the project. The sources are summarized below.

Motor Vehicles

During the years of peak project operation, the project is anticipated to generate approximately 12 average vehicle trips per day. Two of the daily trips would be bulk material and waste deliveries, and 10 would be employee vehicle trips. Consistent with the air quality and GHG emissions modeling, the trip lengths were assumed to be 45 miles per one-way trip. The fleet mix for employees was determined based on Kern County data from EMFAC2021, and the delivery trip fleet mix was assumed to be light-heavy to heavy-heavy duty trucks. Vehicle fuel efficiency was provided by the EMFAC OFFROAD2021 database for an assumed operational year of 2027. Although project construction would be entirely completed in 2028, operations at the finished facilities may begin in 2027.

Processing Equipment

Most on-site equipment would be powered by electricity, with the exception of those presented in Table 4.6-3. Each steam generator would consume between 65 and 90 Millions of British Thermal Units per hour (MMBtu/hr) and was assumed to operate 24 hours per day and 365 days per year. The project may alternatively use existing steam generation from Cogen 32, Steam Generator Setting (SGS) 2868, or SGS 2972, as capacity is available.

Table 4.6-3: Operational Natural Gas-Powered Equipment

Process	Facility	Equipment	Annual Natural Gas Demand (MMBtu)
Pre-combustion (Pre-C)	GP-32	Utility Steam Generator 1	569,400
		Utility Steam Generator 2	569,400
Post-combustion (Post-C)	Cogen 32	Utility Steam Generator 1	648,240
		Utility Steam Generator 2	648,240
		Utility Steam Generator 3	648,240
	SGS 2868	Utility Steam Generator 1	709,560
		Utility Steam Generator 2	709,560
		Utility Steam Generator 3	709,560
	SGS 2972	Utility Steam Generator 1	788,400
		Utility Steam Generator 2	788,400
		Utility Steam Generator 3	788,400
Natural Gas Compression	Del Sur Compressors	S-1548-433	15,941
		S-1548-434	15,941
		S-1548-435	15,941

Key:
GP = Gas Plant
Pre-C = Pre-combustion
Post-C = Post-combustion
SGS = Steam Generator Setting

Thresholds of Significance

The CEQA Appendix G Checklist and the Kern County adopted CEQA thresholds state that a project would have a significant energy impact if it would:

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Project Impacts

Impact 4.6-1: The project would result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.

The energy requirements for the project were determined using the construction and operational estimates generated from the calculation worksheets for energy consumption (Appendix K-1). This impact addresses the energy consumption from both construction and operations, discussed separately below.

Construction Energy Demand

During construction of the project, energy resources would be consumed in the form of diesel and gasoline fuel from the use of off-road equipment (that is, tractors, excavators, cranes) and on-road vehicles (that is, construction employee commutes, vendor, haul trucks).

Temporary electricity may be required to provide as-necessary lighting and electric equipment; such electricity demand would be met by portable generator sets and, possibly, local distribution. Fuel demand associated with portable generators is incorporated in the off-road equipment estimate provided below. The amount of electricity used during construction would be minimal. Natural gas is not anticipated to be required during construction of the project.

Off-Road Equipment

Construction activities associated with the project were estimated to consume 1,795,068 gallons of diesel fuel from the use of off-road equipment. For comparison, in 2021, approximately 3.7 billion gallons of diesel fuel was consumed within California (Appendix K-1). Thus, the diesel fuel required to power the off-road equipment during construction of the project would represent approximately 0.05 percent of the state's annual diesel demand.

On-Road Vehicles

On-road vehicles for construction workers, vendors, and haulers would require fuel for travel to and from the site during construction. Table 4.6-4 provides an estimate of the total on-road vehicle fuel usage during construction.

Table 4.6-4: Construction Vehicle Fuel Consumption

Project Component	Average Fuel Economy (miles/gallon)	Total VMT	Total Fuel Consumption (gallons)
Worker Trips	26.33	21,390,570	812,339
Vendor Trips	7.72	6,462,666	836,885
Haul Trips	6.20	85,050	13,725
Total Construction On-Road Trips		27,919,206	1,661,797

Notes:
Calculations use unrounded numbers; totals may not appear to sum exactly due to rounding.
VMT = vehicle miles traveled
Source: Appendix K-2.

As shown above, construction of the project was estimated to consume 1,661,797 gallons of a combination of gasoline and diesel fuel from on-road vehicles. For comparison, in 2021, approximately 10.2 billion gallons of gasoline for motor vehicles was consumed within California (Appendix K-1). Thus, the fuel required to power the on-road motor vehicles during construction of the project would represent approximately 0.02 percent of the state's annual gasoline demand.

Conclusion

Overall, construction activities associated with the proposed project would result in the consumption of petroleum-based fuels. However, there are no unusual project characteristics that would necessitate the use of construction equipment or vehicles that would be less energy efficient than at comparable construction sites in other parts of the state. Therefore, it is expected that construction fuel consumption associated with the proposed project would not be any more inefficient, wasteful, or unnecessary than at other construction sites in the region.

Operational Energy Demand

During operations of the project, energy would be required to fuel the vehicles traveling to and from the site and to power the proposed equipment, pumps, and facility processes.

Transportation Energy Demand

Table 4.6-5 provides an estimate of the annual fuel consumed by vehicles traveling to and from the project site. As shown in the table, annual vehicular fuel consumption is estimated to be 9,479 gallons of a combination of gasoline and diesel fuel

Table 4.6-5: Operational Vehicle Fuel Consumption

Trip Type	Vehicle Type	Percent of Vehicle Trips	Annual VMT	Average Fuel Economy (miles/ gallon	Total Annual Fuel Consumption (gallons)
Employee Trips	Passenger Cars (LDA)	38.53	45,075	31.44	1,434
	Light Trucks and Medium Duty Vehicles (LDT1, LDT2, MDV)	40.69	47,602	23.77	2,003
	Light-Heavy to Heavy-Heavy Diesel Trucks (LHD1, LHD2, MHDT, HHDT)	20.17	23,596	7.83	3,013
	Motorcycles (MCY)	0.32	371	41.98	9
	Other (OBUS, UBUS, SBUS, MH)	0.30	356	7.02	51
	Employee Trip Subtotal	--	*117,000*	--	*6,509*
Delivery Trips	Light-Heavy to Heavy-Heavy Diesel Trucks (LHD1, LHD2, MHDT, HHDT)	--	23,400	7.83	2,988
Total		--		--	9,479

Notes:
Calculations use unrounded numbers; totals may not appear to sum exactly due to rounding.
VMT = vehicle miles traveled
"Other" consists of buses and motor homes.
Source: Appendix K-1.

As noted previously, in 2021, California consumed approximately 10.2 billion gallons of gasoline (Appendix K-1). The project's anticipated consumption of 9,479 gallons of fuel per year represents approximately 0.00009 percent of the state's annual demand for gasoline. Further, over the lifetime of the project, the fuel efficiency of the vehicles being used by the employees and delivery vehicles is expected to increase. As such, the amount of petroleum consumed as a result of vehicular trips to and from the project site during operation would decrease over time.

Processing Equipment Energy Demand

Most on-site equipment (for example, pumps, maintenance, monitoring, communications) would be powered by electricity from the on-site co-generation facility and supplemented by PG&E, as needed. The expected maximum electric load of the project is approximately 49 MW. As noted previously, Kern County consumed a total of 15,009 GWh of electricity in 2021 (1.71 gigawatt, or 1,710 MW). The project's electricity demand would constitute approximately 2.87 percent of the County's annual electricity demand.

The Pre-C process would share the new substation and electrical distribution system that was included for Cogen 32. Post-C facilities would be constructed at the following three existing facilities: Cogen 32, Steam Generator Setting (SGS) 2868, and SGS 2972. The Pre-C facility would have two natural gas-powered steam generators. Each Post-C facility would have three natural gas-powered steam generators, with carbon capture from those steam generators. The project may alternatively use existing steam generation from Cogen 32, SGS 2868, or SGS 2972, as capacity is available. The total annual natural gas usage was estimated to be 76.3 million therms. Compared to the County's annual usage from 2021 (1,866 million therms), the project's natural gas use would represent approximately 4.1 percent of the County's natural gas demand.

Although the project would result in increased demand for energy resources, the energy would be consumed efficiently and would be typical of industrial carbon capture projects. In addition, carbon capture and sequestration projects, such as the proposed project, are essential to achieve the state's climate goals; as a result, any energy consumed by the project is not considered to be wasteful or unnecessary.

Conclusion

Based on the analysis above, the project would consume energy resources during construction and operations. However, the energy consumption associated with the proposed project would not be inefficient, wasteful, or unnecessary.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

Impact 4.6-2: The project would conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Construction

During construction, off-road equipment and on-road vehicles would comply with all applicable federal and state requirements. For example, all off-road equipment would be subject to the most recent In-Use Off-Road Diesel-Fueled Fleets Regulations adopted by the CARB, which establish engine efficiency requirements, among other requirements. Off-road engines are categorized per engine tier, with Tier 0 being the least efficient and Tier 4 Final being the cleanest and most efficient. Compliance with the In-Use Off-Road Diesel-Fueled Fleets Regulations would ensure that the project construction fleet would consist of energy-efficient engines. With respect to the on-road vehicle fleet operations, the EPA and NHTSA have adopted Federal Vehicle Standards with which the project would comply. The on-road construction fleet would incorporate these standards as they purchase newer model trucks and turn over their fleet. As such, these regulations would have an overall beneficial effect on reducing nationwide fuel consumption over time as older trucks are replaced. Moreover, heavy-duty trucks would be required to comply with CARB's 5-minute

idling limits which would reduce fuel consumption. Although the foregoing regulations were primarily designed to reduce air quality emissions, they would also result in an increase in energy efficiency during construction.

Operation

California adopted the RPS in order to increase the amount of renewable energy supplied by utilities within the state. As noted previously, the project would use electricity from PG&E during operations. PG&E will continue to be subject to state RPS requirements, and the project would not preclude achievement of the RPS goals. In addition, any new structures developed as part of the project would comply with federal, state, and local regulations aimed at reducing energy consumption, including the Building Energy Efficiency Standards (California Code of Regulations Title 24, Part 6) the CALGreen Code (California Code of Regulations Title 24, Part 11). Moreover, the project directly supports the goals laid out in CARB's 2022 Scoping Plan, including the measures related to carbon capture and storage. Finally, the project would be subject to the CARB's Carbon Capture and Sequestration Protocol under the LCFS. The LCFS requirements are designed to decrease the carbon intensity of fuels and increase the range of renewable alternatives; therefore, the project's compliance with the CARB's Carbon Capture and Sequestration Protocol would indirectly support the state plan for renewable energy.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

4.6.5 Cumulative Setting, Impacts, and Mitigation Measures

Due to the proposed project's location within an existing oil and gas field, the impacts of the project, together with the impacts of past, present and reasonably foreseeable future oil and gas development, including wells and abandonment activity to implement carbon capture and storage projects, constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative

impacts of the disturbance, construction activities, and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The aforementioned documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells per year County wide of various types (production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 other wells (cyclic wells, SB 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for 8 years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. The California Geologic Energy Management Division permitting for all wells, with the exception of plugging and abandonments, has never averaged over 2,000 permits a year (as implementation in some years of the County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts on energy resources is Kern County. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects*, would have on energy resources. This geographic scope of analysis is appropriate because energy resources within this area are expected to be similar to those in the project site because of their proximity and similar environments would result in similar land-use—and thus, site types.

Impact 4.6-3: Contribute to Cumulative Energy Impacts

With regard to energy, the project has the potential to contribute significantly to cumulative impacts within the study area. A complete analysis of the cumulative impacts of the various energy generating activities from oil and gas are provided in Chapter 4.6, *Energy*, of the Oil and Gas EIR.

The main contribution of energy consumption from the project during the construction phase would be construction equipment usage, haul truck trips, and employee trips. However, construction fuel use would be finite and temporary and would cease at the end of construction activities. The majority of energy consumption during project operation would be natural gas consumption by operational equipment, operational electrical consumption, and maintenance trips and employee trips.

While the use of the estimated 49 MW for the project is not significant, the cumulative impacts of the known and unknown carbon capture and storage (CCS) projects in the PG&E service area may be. The consumption of 49 MW per year of electricity to capture and store CO_2 is a diversion of electricity from other residential and commercial uses. An estimated 19,000 to 47,000 homes could be provided electricity from this one capture facility usage. Further using a conservative estimate that the four other known CCS projects listed in Chapter 3, *Project Description*, would each use approximately 30-49 MW for an average of 40 MW, the total consumption of electricity

from just one source to capture and store CO_2, based on the 40 MW average, would be 160 MW—the equivalent of power for approximately 63,000 to 155,000 homes.

Even using renewable energy such as solar would divert electricity from other needs in the region, as the other sources for the total injection maximum yearly of 3.3 million metric tons of CO_2 for this one project could divert a significant amount of electricity from other residential, commercial, and industrial uses. Tracking the energy efficiency and consumption of the capture facilities utilized with this initial source and each subsequent source will ensure that energy planning in the region accounts for the carbon removal activities and encourage energy conservation and better efficiency for each new source. MM 4.6-1 requires an annual report of electricity consumption for all sources permitted to provide CO_2 for injection and storage and evaluation of any methods to reduce the consumption of any forms of electricity in the capture process. The cumulative impacts on the regional grid, which have not been determined to meet the CARB 2045 goals for production, are significant and unavoidable even with mitigation.

Mitigation Measures

MM 4.6-1 The operator shall provide an annual report on the total amount of electricity consumed by the carbon capture facilities associated with sources that send CO2 for injection into the project storage site. The report shall detail the facility the source of the power and the annual amount. The report shall include a discussion of modifications that are being considered by each source to reduce electricity use. The first report is due the 13th month after the first month injection commences. The report shall be provided to the Kern County Planning and Natural Resources Agency, U.S. Environmental Protection Agency Underground Injection Control Permit Division, California Air Resources Board, California Public Utilities Commission, California Energy Commission, and California Independent System Operators.

Level of Significance after Mitigation

Cumulative impacts would be significant and unavoidable.

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Section 4.7

Geology and Soils

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Section 4.7

Geology and Soils

4.7.1 Introduction

This section of the Environmental Impact Report (EIR) describes the affected environment and regulatory setting for geology and soil resources. It also describes the impacts on geologic and soil resources that would result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, Project Description) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers) southwest of the community of Lost Hills and west of State Route (SR) 33.

The analysis in this section is largely based on the Desktop Geohazards and Geotechnical Assessment prepared by Stantec Consulting Services Inc. (Stantec) (Stantec 2023a; Appendix E-1), the Paleontological Resource Assessment prepared by Stantec (Stantec 2023b; Appendix E-3), and the U.S. Environmental Protection Agency Class VI Permit Application Narrative for the Aera CarbonFrontier Project, which is included as Appendix E-2 of this Draft EIR and incorporated by reference herein. Information was obtained from Section 4.6, *Geology and Soils*, of the Kern County *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015), supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding oilfield environmental impacts and cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152).

A description of the environmental setting (affected environment) for geology and soils is presented in Section 4.7.2, *Environmental Setting*, including a discussion of the regional and local setting. The regulatory setting applicable to geology and soils is presented in Section 4.7.3, *Regulatory Setting*, and Section 4.7.4, *Impacts and Mitigation Measures*, discusses project impacts and associated mitigation measures.

4.7.2 Environmental Setting

Regional Geologic Setting

The Belridge oilfields are contiguous and located west of SR 33, approximately seven miles southwest of the community of Lost Hills, in Kern County, California. The project site is located in the San Joaquin Valley, within the southern half of the Great Valley Geomorphic Province of

California. The Great Valley is characterized by a broad alluvial plain extending over 400 miles through Central California and reaching up to 50 miles wide. The San Joaquin Valley is approximately 200 miles long and up to 70 miles wide. The northern portion of the San Joaquin Valley is drained by the San Joaquin River, which flows from east-central California to the San Francisco Bay before reaching the Pacific Ocean. The southern portion of the San Joaquin Valley drains into two terminal lake beds: Tulare Lake and Buena Vista Lake. Geologically, the San Joaquin Valley structural trough is characterized by marine and continental sedimentary deposits that reach thicknesses of up to 32,000 feet.

Regional Seismicity

The U.S. Geological Survey (USGS) has mapped Quaternary active faults within 35 miles of the project site (USGS 2023). The nearest Quaternary active faults mapped by the USGS are the San Andreas fault zone, a right-lateral fault zone located approximately 10 miles west of the project site, and the Poso Creek fault, approximately 25 miles east of the project site. Other named and unnamed Quaternary active faults have also been mapped within a 35-mile radius of the project site.

The project site is located within an area where earthquakes have occurred in historic times. In 1857, a magnitude 7.9 earthquake was recorded approximately 30 miles northwest of the project site. In 1937, a magnitude 6.0 earthquake was recorded approximately 35 miles northwest of the project site. Smaller magnitude events are well documented within the project vicinity and surrounding region.

Regional Groundwater

The project site is located within the Central Valley Groundwater Basin, San Joaquin Basin, and Kern County subbasin. Broadly speaking, groundwater flow is to the east and toward the main valley floor. Potentiometric surface analysis for the alluvial deposits indicates the groundwater flow in the North Belridge oilfield area is to the north-northeast, and in the South Belridge oilfield area groundwater flows to the east-northeast.

The California Department of Water Resources (CDWR) and USGS periodically monitor groundwater levels in water wells surrounding the project site. The groundwater level at an observation well (Site Code 355137N1195985W0001) located approximately 8.9 miles east of the project site is reported as 34.3 feet below ground surface (bgs) on October 17, 2022. The groundwater level at an observation well (Site Code 354021N1195011W001), located approximately 9 miles southeast of the project site is reported as 124.2 feet bgs on October 12, 2022 (Stantec 2023; Appendix E-1).

The Belridge multiple-well monitoring site (Belridge Water Storage District) is located approximately 1.3 miles east and downgradient from the northeast corner of the South Belridge oilfield. Table 4.7-1 provides the most recent depth-to-water data from this group of groundwater monitoring wells.

Table 4.7-1: Belridge Multiple-well Monitoring Site

Well No.	USGS Site ID	Location (lat/long)	Well Depth (ft)	Depth to Water (ft bgs)	Date Collected
BWSD 5	353049119434105 028S021E08A005M	35°30'49.07", 119°43'41.96"	280	156.04	1/18/2023
BWSD 4	353049119434104 028S021E08A004M	35°30'49.07", 119°43'41.96"	530	178.96	1/18/2023
BWSD 3	353049119434103 028S021E08A003M	35°30'49.07", 119°43'41.96"	890	518.08	1/18/2023
BWSD 2	353049119434102 028S021E08A002M	35°30'49.07", 119°43'41.96"	1190	519.01	1/18/2023
BWSD 1	353049119434101 028S021E08A001M	35°30'49.07", 119°43'41.96"	1515	681.65	1/18/2023

Source: Stantec Consulting Services, Inc, 2023; Appendix E-1
Key:
bgs = below ground surface
BWSD = Belridge Water Storage District
ft = feet
lat/long = latitude and longitude
USGS = U.S. Geological Survey

The approximate surface elevation of the project site is 546 feet above mean sea level. Based on the above groundwater level data, the estimated depth to groundwater at the project site is 150 to 500 feet bgs.

Paleontological Setting

A Paleontological Resource Assessment was conducted by Stantec to assess the paleontological resource potential within the project area (Appendix E-3). Paleontological resources are the mineralized (fossilized) remains of prehistoric plants and animals and the mineralized impressions (trace fossils) left as indirect evidence of the forma and activity of such organisms. These resources are located within sedimentary rocks or alluvium and are considered nonrenewable. Formations that contain vertebrate fossils are considered more sensitive because vertebrate fossils tend to be rare and fragmentary. Formations containing microfossils, plant casts, and invertebrate fossils are more common.

A significant fossil deposit is a rock unit or formation that contains significant nonrenewable paleontological resources. This is defined as comprising one or more identifiable vertebrate fossils, large or small, and any associated invertebrate and plant fossils, traces, and other data that provide taphonomic, taxonomic, phylogenetic, ecologic, and stratigraphic information (ichnites and trace fossils generated by vertebrate animals such as trackways or nests and middens) that provides datable material and climatic information. This definition excludes invertebrate or botanical fossils

except when present within a given vertebrate assemblage. However, invertebrate and botanical fossils may be significant as environmental indicators associated with vertebrate fossils.

The project site consists of Quaternary-age alluvial deposits ranging from gravel to sand, silt, and clay units. The Tulare Formation underlies the Quaternary alluvium and consists of weakly indurated gravel, pebble, sand, and clay. The Tulare Formation is known to preserve paleontological resources across the San Joaquin Valley. A review of the scientific literature indicates the Tulare Formation has yielded additional significant fossils, such as fish (freshwater dolphins, birds, tortoises, and the largest assemblage of freshwater clams and snails known from this era along the Pacific Coast. The Tulare Formation is underlain by the San Joaquin Formation, the Etchegoin Formation, and the Monterey Shale. The San Joaquin Formation is characterized as a Pliocene-age sandstone, silty sand, and siltstone containing mostly marine fossils.

The Tulare Formation consists of weakly indurated valley deposits of pebble gravel, sand, and clay derived from exposed Monterey Shale bedrock of the Temblor Range to the southwest and date to the Pleistocene, and possibly to the late Pliocene (0.6 to 2.5 million years ago). The Tulare Formation records the first terrestrial sediments deposited in the San Joaquin Valley after the last marine transgression at the end of the Pliocene. The Natural History Museum of Los Angeles County has no records of vertebrate localities in the project area, but has identified three localities from the Kettleman Hills to the north of the project area as well as one locality farther northeast in the vicinity of Alpaugh. The localities preserved fish, pack rat, eared seal, and camel family specimens as well as freshwater invertebrates. The online database of the University of California Museum of Paleontology indicates they have 15 vertebrate localities in the Tulare Formation, some of which are from the Kettleman Hills and some of which cannot be attributed to a more specific area than Kern County, based on the information provided online.

Local Geologic Setting

Stratigraphy

The surficial geology of the project site consists of Quaternary-age alluvial deposits ranging from gravel to sand, silt, and clay units. The Tulare Formation underlies the Quaternary alluvium and consists of weakly indurated gravel, pebble, sand, and clay. Clay units vary in permeability. The Tulare Formation is underlain by the San Joaquin Formation, the Etchegoin Formation, and the Monterey Shale. The San Joaquin formation is characterized as a Pliocene aged sandstone, silty sand, and siltstone containing mostly marine fossils. The Etchegoin Formation is a marine sandstone. The Monterey Shale is a marine biogenic deposit characterized by clayey to siliceous shales with varying degrees of bedding, weathering, and lithification.

Structurally, the project site is located along the western margin of the San Joaquin fold belt. The fold belt is characterized by fault-bend and fault-propagated folds associated with complex faulting in the area resulting in a series of anticlines and synclines along the southern and western boundaries of the San Joaquin Valley.

The Monterey Shale is a marine biogenic deposit characterized by clayey to siliceous shales with varying degrees of bedding, weathering, and lithification.

Surface Soils

Soils mapped on the project site are primarily alluvial and include Kimberlina fine sandy loam with 0 to 9 percent slopes, Milham sandy loam with 0 to 5 percent slopes, and Panoche clay loam with 0 to 5 percent slopes. These soils are not considered hydric soils.

Faults and Seismic History

Twelve subsurface faults with measurable vertical offset were interpreted from a three-dimensional (3D) seismic survey of the project site and correlated with well log data. These fault interpretations were incorporated into a static 3D geologic model to support the project's Underground Injection Control (UIC) Class VI application. Four of the identified faults form the boundaries of the Area of Review (AOR) in which the carbon dioxide (CO_2) plume will be contained, an additional six are contained within the AOR bounding faults, and two are located outside of the AOR. None of the faults identified offset Quaternary strata or have ground surface expressions and were consequently interpreted to be inactive.

Each fault transects the injection zone. Furthermore, fault stability analysis indicates that these faults are stable and not susceptible to movement.

No active faults have been identified by the State Geologist of the California Division of Mines and Geology for the project area.

The project site is not located within a State-designated Alquist-Priolo Earthquake Fault Zone, where site-specific studies addressing the potential for surface fault rupture are required.

Fault Rupture

Ground surface rupture along an earthquake fault may cause damage to aboveground infrastructure and other features. The State of California has mapped known active faults that may cause surface fault rupture in inhabited areas as part of the Alquist-Priolo Earthquake Fault Zoning Act. As mentioned above, the project site is not located within an Earthquake Fault Zone regulated under the Alquist-Priolo Earthquake Fault Zoning Act.

Slope Stability

No evidence of historic landslides or creep was observed within the project area. The project site is relatively flat, with a topographic gradient of less than 5 percent. Overall, the site appears to be stable.

Soil Hazards

Geologic hazards associated with soil characteristics include erosion, expansion (shrink-swell patterns), and settlement, as described below.

Erosion

Soil erosion occurs when surface materials are worn away from the earth's surface due to land disturbance and/or natural factors such as wind and precipitation. The potential for soil erosion is determined by characteristics including texture and content, surface roughness, vegetation cover, and slope grade and length. Wind erosion typically occurs when fine-grained, non-cohesive soils are exposed to high-velocity winds, while water erosion tends to occur when loose soils on moderate to steep slopes are exposed to high-intensity storm events.

Within the project site, the predominantly fine-grained soils are potentially susceptible to erosion or the loss of topsoil due to surface water flows and wind-driven movement. The on-site soils have a very low to medium runoff potential (the potential for water to runoff into drainage channels vs. infiltrate directly into the soil). The erosion potential for each on-site soil was also determined using the K-Factor. The soil-erodibility factor (K) represents (1) the susceptibility of soil or surface material to erosion, (2) the transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff, although these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment, and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high runoff rates and large runoff volumes.

The erosion potential for soils increases when the soils are disturbed, the existing vegetation is removed, and the soil is exposed to wind and raindrop impact. Additionally, steeper slopes will tend to erode faster if not protected with erosion and sediment control best management practices (BMPs).

Expansion

Soils that expand and contract in volume (shrink-swell pattern) are considered to be expansive and may cause damage to aboveground infrastructure as a result of density changes that shift overlying materials. Fine-grain clay sediments are most likely to exhibit shrink-swell patterns in response to changing moisture levels.

Settlement

The settlement of soils is characterized by sinking or descending soils that occurs as the result of the placement of a heavy load on underlying sediments and may be triggered by seismic events. Seismically induced settlement is dependent on the relative density of the subsurface soils.

Within the project site, in California's San Joaquin Valley, the primary cause of land subsidence is groundwater pumping in unconsolidated aquifers. Surface subsidence due to groundwater withdrawal is well documented within the San Joaquin Valley Groundwater Basin and Kern County Subbasin. Approximately 900 square miles within the San Joaquin River Hydrologic Region have subsided, with subsidence reaching up to 2.25 feet in some areas.

Surface subsidence due to oil extraction has been documented at the project site. Subsidence at the project site has been attributed to the withdrawal of oil and gas from diatomaceous reservoirs at depths of approximately 1,000 to 2,000 feet bgs.

Although unconsolidated alluvial soils are present over portions of the project site, these soils are largely unsaturated and are not used as a source of groundwater. Therefore, the risk of subsidence in these soils is low. Monitoring data indicate that subsidence mitigation efforts have been successful and little-to-no subsidence occurs today. For this reason, the risk of subsidence at the project site due to oil and gas extraction is considered moderate.

Liquefaction

Liquefaction is the phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of earthquake-induced strong ground shaking. Liquefaction can produce excessive settlement, ground rupture, lateral spreading, or failure of shallow bearing foundations. To determine the liquefaction susceptibility of a region, three major factors must be analyzed. These include (1) the density and textural characteristics of the alluvial sediments, (2) the intensity and duration of ground shaking, and (3) the depth to groundwater.

Zones of Required Evaluation referred to as "Seismic Hazard Zones" in California Code of Regulations Article 10, Section 3722, are areas shown on Seismic Hazard Zone maps where site evaluations are required to determine the need for mitigation of potential liquefaction and/or earthquake-induced landslide ground displacements.

The project site is not within any currently mapped Liquefaction Zones established by the California Geological Survey (CGS) as the area has not been evaluated for liquefaction or landslide hazards. Additionally, the project site is outside of Earthquake Zones of Required Investigation, as mapped by CGS.

Based on the near-surface soil conditions, anticipated subsurface soil conditions, depth to groundwater, and proximity to seismically active faults, the potential for seismically induced settlement, including liquefaction, is low to moderate at the project site (less than 50 percent probability within the next 100 years).

Lateral Spreading

Lateral spreading is a potential hazard commonly associated with liquefaction where extensional ground cracking and settlement occur following lateral migration of subsurface liquefiable material. These phenomena typically occur adjacent to free faces, such as slopes and creek channels. Considering the general topography of the project site terrain and the likely absence of liquefaction, lateral spreading would be unlikely.

4.7.3 Regulatory Setting

Geologic resources and geotechnical hazards are governed primarily by local jurisdictions. The conservation elements and seismic safety elements of city and county general plans contain policies for the protection of geologic features and avoidance of hazards.

CEQA is the major environmental statute that guides the design and construction of projects on nonfederal lands in California. This statute sets forth a specific process of environmental impact analysis and public review. In addition, the project proponent must comply with other applicable State and local applicable statutes, regulations, and policies. Relevant and potentially relevant statutes, regulations, and policies are discussed below.

Federal

Clean Water Act

The Clean Water Act (CWA) (33 United States Code Section 1251 et seq.), formally the Federal Water Pollution Control Act of 1972, was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point sources and certain non–point source discharges to surface water. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (CWA Section 402). Projects that disturb one or more acres of land are required to obtain NPDES coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, State Water Resources Control Board Order No. 2022-0057-DWQ. The General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which includes BMPs to protect stormwater runoff.

Requirements of the federal CWA and associated SWPPP requirements are described in further detail in Section 4.9, *Hydrology and Water Quality*.

State

Alquist-Priolo Earthquake Fault Zoning Act of 1972

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 regulates the development and construction of buildings intended for human occupancy to avoid the hazard of surface fault rupture. In accordance with this law, the CGS maps active faults and designates Earthquake Fault

Zones along mapped faults. The Alquist-Priolo Earthquake Fault Zoning Act groups faults into categories of active, potentially active, and inactive. Historic- and Holocene-age faults are considered active, Late Quaternary- and Quaternary-age faults are considered potentially active, and pre-Quaternary-age faults are considered inactive. These classifications are qualified by the conditions that a fault must be shown to be "sufficiently active" and "well defined" by detailed site-specific geologic explorations to determine whether building setbacks should be established. Any project that involves the construction of buildings or structures for human occupancy, such as an operation and maintenance building, is subject to review under the Alquist-Priolo Earthquake Fault Zoning Act, and any structures for human occupancy must be located at least 50 feet from any active fault.

Seismic Hazards Mapping Act of 1990

In accordance with Public Resources Code, Chapter 7.8, Division 2, the CGS delineates Seismic Hazard Zones through the Seismic Hazards Zonation Program. The purpose of the Seismic Hazards Mapping Act is to reduce the threat to public health and safety and to minimize the loss of life and property by identifying and mitigating seismic hazards, such as those associated with strong ground shaking, liquefaction, landslides, other ground failures, or other hazards caused by earthquakes. Cities, counties, and State agencies are directed to use Seismic Hazard Zone Maps developed by the CGS in their land use planning and permitting processes. In accordance with the Seismic Hazards Mapping Act, site-specific geotechnical investigations must be performed prior to permitting most urban development projects within Seismic Hazard Zones.

California Integrated Seismic Network

The California Integrated Seismic Network (CISN) began in November 2000 with the mission to operate a reliable, modern, statewide system for earthquake monitoring, research, archiving, and distribution of information for the benefit of public safety, emergency response, and loss mitigation. The CISN seeks to mitigate the impact of future earthquakes by collecting, processing, and disseminating critical earthquake information in a timely way.

Six organizations collaborate in the CISN to monitor earthquakes and collect data to support improvements to earthquake resilience. Core members of the CISN are the CGS, the California Institute of Technology Seismological Laboratory, the University of California–Berkeley Seismological Laboratory, USGS Menlo Park, USGS Pasadena, and the California Governor's Office of Emergency Services. The CISN has three management centers with different responsibilities:

- Southern California Earthquake Management Center: California Institute of Technology and USGS Pasadena
- Northern California Earthquake Management Center: University of California–Berkeley and USGS Menlo Park
- Center for Engineering Strong Motion Data

The Northern and Southern California Earthquake Management Centers operate as twin earthquake processing centers. The engineering earthquake management center has the lead responsibility for producing engineering data products.

California Building Code

The California Building Code (2022) contains general building design and construction requirements relating to fire and life safety, structural safety, and access compliance.

In accordance with California Building Code Chapter 18, Soils and Foundations, geotechnical investigations shall be conducted in accordance with Section 1803.2 and reported in accordance with Section 1803.6. Where required by the building official or where geotechnical investigations involve in situ testing, laboratory testing, or engineering calculations, such investigations shall be conducted by a registered design professional.

Senate Bill 905

The Creation of a Carbon Capture Regulatory Framework (Senate Bill [SB] 905) was passed by the California Legislature in September 2022. SB 905 requires the California Air Resources Board (CARB) to establish a carbon capture, removal, utilization, and storage (CCUS) program to evaluate CCUS and CO_2 removal (CDR) technologies.

More specifically, SB 905 requires CARB to:

- Establish a "Carbon Capture, Removal, Utilization and Storage Program to evaluate the efficacy, safety, and viability of CCUS." CARB will also be required to enhance monitoring procedures for leakage.
- Ensure that CO_2 capture, removal, and sequestration projects include specified components including, among others, certain monitoring activities.
- Adopt regulations for a unified permit application and for the construction and operation of CCUS projects (including an expedited review process) by January 1, 2025. All CCUS projects within California are required to use this application process and CARB will develop a centralized public database to track all in-state projects.
- Develop a centralized public database to track the deployment of CCUS and CDR technologies and the development of CO_2 capture, removal, and sequestration projects throughout the state by January 1, 2025.
- Adopt protocols to support additional and new methods for CO_2 utilization and CO_2 storage by January 1, 2025.
- Adopt financial responsibility regulations for CCUS projects that require the CO_2 storage operator to maintain financial responsibility for not less than 100 years after the last date of injection by January 1, 2025.
- Publish a framework for governing agreements regarding two or more tracts of land overlying the same geologic storage reservoir or reservoirs by July 1, 2025. The

agreements will set out to manage, develop, and operate CCUS or CDR projects. SB 905 ensures that title to any geologic storage reservoir for CO_2 is vested in the owner of the overlying surface estate (unless it has been severed and separately conveyed).

- SB 905 also requires CARB to include monitoring and reporting requirements for CO_2 storage operators, establish a working group on CO_2 storage, and restrict CO2 injection into Class II injection wells for enhanced oil recovery.

Additionally, SB 905 requires:

- CCUS project operators to provide at least a 60-day written notice to each surface or subsurface owner adjacent to a geologic storage complex or reservoir before commencing development. Project operators must also prove and maintain financial responsibility for the project. Agreements between operators and relevant parties, that any drilling or extraction be prohibited in the geologic storage reservoir for at least 100 years after the CO_2 is injected, must be made for every project. All project operators also need to create an air monitoring and mitigation plan that is submitted to CARB.
- Require changes in operations of a CO_2 capture, removal, or sequestration project to ensure public and environmental health and safety if the monitoring and reporting detects increased seismicity or CO_2 leak outside the geologic storage reservoir.

Senate Bill 1314

Critics of CCUS projects using underground sequestration are concerned that such injections can increase pressures in storage locations proximate to oil and gas reserves, (in)directly enhancing further recovery of carbon-based fuels. SB 1314 "plugs this hole" in part by prohibiting a CCUS project operator from injecting a concentrated CO_2 fluid produced by a CO_2 capture project or a CO_2 capture and sequestration project into a Class II injection well for purposes of enhanced oil recovery, including the facilitation of enhanced oil recovery from another well.

Geologic Carbon Sequestration Group

The Geologic Carbon Sequestration Group is now mandated to provide (Public Resources Code [PRC 2213(a)] independent expertise and regulatory guidance to CARB, including, but not limited to:

- Identification of high-quality, suitable locations for Class VI injection wells (Class VI is the U.S. Environmental Protection Agency's designation for wells used to inject CO_2 into deep rock formations for purposes of long-term sequestration).
- Identification of appropriate subsurface monitoring to ensure geologic sequestration of injected CO_2.
- Identification of hazards that may require the suspension of CO_2 injections.
- The state geologist shall report seismic activity or (subsurface) leakage of CO_2 from a CO_2 capture, removal, or sequestration project to the state board and may recommend changes in the operations of the project to the state board (PRC 71463).

Local

Construction and operation of the project are subject to policies and regulations contained within the Kern County General Plan (KCGP), the Kern County Zoning Ordinance, and the Kern County Code of Building Regulations, which include policies for the avoidance of geologic hazards and/or the protection of unique geologic features, as well as for the preservation of paleontological resources (see Section 4.5, *Cultural Resources*, for discussion of paleontological resources relevant to the project). The policies, goals, and implementation measures in the KCGP for geology and soils applicable to the project are provided below. The KCGP contains additional policies, goals, and implementation measures that are more general and are not specific to development such as the project. These measures are not listed below, but as stated in Chapter 2, *Introduction*, all policies, goals, and implementation measures in the KCGP are incorporated by reference.

Kern County General Plan

The project site is located within the KCGP. The policies, goals, and implementation measures in the KCGP applicable to geology and soils as related to the project are provided below. The KCGP contains additional policies, goals, and implementation measures that are more general and not specific to development such as the project. Therefore, they are not listed below.

Chapter 1. Land Use, Open Space, and Conservation Element

1.3 – Physical and Environmental Constraints

Policies

Policy 1. Kern County will ensure that new developments will not be sited on land that is physically or environmentally constrained (Map Code 2.1 [Seismic Hazard], Map Code 2.2 [Landslide], Map Code 2.3 [Shallow Groundwater], Map Code 2.5 [Flood Hazard], Map Codes from 2.6 – 2.9, Map Code 2.10 [Nearby Waste Facility], and Map Code 2.11 [Burn Dump Hazard]) to support such development unless appropriate studies establish that such development will not result in unmitigated significant impact.

Policy 6. Regardless of percentage of slope, development on hillsides will be sited in the least obtrusive fashion, thereby minimizing the extent of topographic alteration required and reducing soil erosion while maintaining soil stability.

Policy 7. Ensure effective slope stability, wastewater drainage, and sewage treatments in areas with steep slopes are adequate for development.

1.10.3 - Archaeological, Paleontological, Cultural, and Historical Preservation

Implementation Measure

Measure M. In areas of known paleontological resources, the County should address the preservation of these resources where feasible.

Chapter 4. Safety Element

4.3 – Seismically Induced Surface Rupture, Ground Shaking, and Ground Failure

Policy

Policy 1. The County shall require development for human occupancy to be placed in a location away from an active earthquake fault in order to minimize safety concerns.

4.5 – Landslides, Subsidence, Seiche, and Liquefaction

Policy

Policy 1. Determine the liquefaction potential at sites in areas of shallow groundwater (Map Code 2.3) prior to discretionary development and determine specific mitigation to be incorporated into the foundation design, as necessary, to prevent or reduce damage from liquefaction in an earthquake.

Policy 2. Route major lifeline installations around potential areas of liquefaction or otherwise protect them against significant damage from liquefaction in an earthquake.

Policy 3. Reduce potential for exposure of residential, commercial, and industrial development to hazards of landslide, land subsidence, liquefaction, and erosion.

Kern County Code of Building Regulations – Title 17

All construction in the county is required to conform to the Kern County Building Code (Chapter 17.08, Building Code, of the Kern County Code of Regulations). Kern County has adopted the California Building Code, 2019 Edition, with some modifications and amendments. The entire county is in Seismic Zone 4, a designation previously used in the Uniform Building Code to denote the areas of highest risk to earthquake ground motion. California has established an Unreinforced Masonry program that details seismic safety requirements for Zone 4. Seismic provisions associated with Seismic Zone 4 have been adopted.

Chapter 17.28 of Kern County Grading Code

The purpose of the Kern County Grading Code is to safeguard life, limb, property, and public welfare by regulating grading on private property. All requirements of the Kern County Grading Code would be applied during project implementation. All required grading permit(s) would be obtained prior to the commencement of construction activities. Sections of the Grading Code that are particularly relevant to geology and soils are provided below.

Section 17.28.140 Erosion Control

A. Slopes. The faces of cut and fill slopes shall be prepared and maintained to control against erosion. This control may consist of effective planting. The protection for the slopes shall be installed as soon as practicable and prior to calling for final approval. Where cut slopes are not subject to erosion due to the erosion-resistant character of the materials, such protection may be omitted.

B. Other Devices. Where necessary, check dams, cribbing, riprap or other devices or methods shall be employed to control erosion and provide safety.

C. Temporary Devices. Temporary drainage and erosion control shall be provided as needed at the end of each workday during grading operations, such that existing drainage channels would not be blocked. Dust control shall be applied to all graded areas and materials and shall consist of applying water or another approved dust palliative for the alleviation or prevention of dust nuisance. Deposition of rocks, earth materials, or debris onto adjacent property, public roads, or drainage channels shall not be allowed.

Section 17.28.170 Grading Inspection

A. General. All grading operations for which a permit is required shall be subject to inspection by the building official. Professional inspection of grading operations and testing shall be provided by the civil engineer, soils engineer, and the engineering geologist retained to provide such services in accordance with Subsection 17.28.170(E) for engineered grading and as required by the building official for regular grading.

B. Civil Engineer. The civil engineer shall provide professional inspection within such engineer's area of technical specialty, which shall consist of observation and review as to the establishment of line, grade, and surface drainage of the development area. If revised plans are required during the course of the work, they shall be prepared by the civil engineer.

C. Soils Engineer. The soils engineer shall provide professional inspection within such engineer's area of technical specialty, which shall include observation during grading and testing for required compaction. The soils engineer shall provide sufficient observation during the preparation of the natural ground and placement and compaction of the fill to verify that such work is being performed in accordance with the conditions of the approved plan and the appropriate requirements of this chapter. Revised recommendations relating to conditions differing from the approved soils engineering and engineering geology reports shall be submitted to the permittee, the building official and the civil engineer.

D. Engineering Geologist. The engineering geologist shall provide professional inspection within such engineer's area of technical specialty, which shall include professional inspection of the bedrock excavation to determine if conditions encountered are in conformance with the approved report. Revised recommendations relating to conditions differing from the approved engineering geology report shall be submitted to the soils engineer.

E. Permittee. The permittee shall be responsible for the work to be performed in accordance with the approved plans and specifications and in conformance with the provisions of this Code, and the permittee shall engage consultants, if required, to provide professional inspections on a timely basis. The permittee shall act as a coordinator between the consultants, the contractor and the building official. In the event of changed conditions, the permittee shall be responsible for informing the building official of such change and shall provide revised plans for approval.

F. Building Official. The building official may inspect the project at the various stages of the work requiring approval to determine that adequate control is being exercised by the professional consultants.

G. Notification of Noncompliance. If, in the course of fulfilling their responsibility under this chapter, the civil engineer, the soils engineer, or the engineering geologist finds that the work is not being done in conformance with this chapter or the approved grading plans, the discrepancies shall be reported immediately in writing to the permittee and to the building official. Recommendations for corrective measures, if necessary, shall also be submitted.

H. Transfer of Responsibility. If the civil engineer, the soils engineer, or the engineering geologist of record is changed during the course of the work, the work shall be stopped until:

1. The civil engineer, soils engineer, or engineering geologist has notified the building official in writing that they will no longer be responsible for the work and that a qualified replacement has been found who will assume responsibility.

2. The replacement civil engineer, soils engineer, or engineering geologist notifies the building official in writing that they have agreed to accept responsibility for the work.

4.7.4 Impacts and Mitigation Measures

This section describes the methodology used in conducting the CEQA impact analysis for geology and soils; the thresholds of significance used in assessing impacts on geology and soils; and the assessment of impacts on geology and soils, including relevant mitigation measures.

Methodology

The analysis in this section is largely based on the Aera CarbonFrontier Project Desktop Geohazards and Geotechnical Assessment and the Paleontological Resource Assessment prepared by Stantec (Appendix E). This section describes the potential geology and soils impacts associated with the development of the project. This analysis first established baseline conditions for the affected environment relevant to geology and soils, as presented above in Section 4.7.2, *Environmental Setting.*

Thresholds of Significance

The County CEQA Implementation Document and Environmental Checklist state that a project would have a significant impact on geology and soils if it would:

- Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the state geologist for the area or based on other substantial evidence of a known fault;
  - Strong seismic ground shaking;
  - Seismic-related ground failure, including liquefaction;
  - Landslides.
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-site or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater;
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Project Impacts

Impact 4.7-1: Directly or Indirectly Cause Substantial Adverse Effects, Including the Risk of Loss, Injury, or Death Involving the Rupture of a Known Earthquake Fault, as Delineated on the Most Recent Alquist-Priolo Earthquake Fault Zoning Map Issued by the State Geologist for the Area or Based on Other Substantial Evidence of a Known Fault

Primary ground rupture is ground deformation that occurs along the surface trace of the causative fault during an earthquake. The proposed project would introduce structures and people to the project site and could, therefore, expose people and structures to seismic risks. The project site is not located within a State-designated Alquist-Priolo Earthquake Fault Zone where site-specific studies addressing the potential for surface fault rupture are required; however, as described in Section 4.7.2, *Environmental Setting*, there are numerous earthquake faults in the vicinity of the project area. Both the San Andreas Fault Zone (approximately 10 miles to the west) and the Poso Creek Fault (25 miles to the east), are major structural elements of California, with the San Andreas

Fault Zone being mapped within State-designated Alquist-Priolo Earthquake Fault Zones as defined by Special Publication 42, published by the CGS.

In addition to direct damage to project structures, the level of seismic activity in the region potentially could result in CO_2 leakage from underground storage. However, though the Belridge oilfields are in a seismically active region, only minor or inactive faults have been mapped in the Belridge oilfields. The closest major active fault near the project site is the San Andreas fault, located approximately 10 miles west. No previous regional seismic events, including the 1952 Kern County earthquake, the largest in the region (estimated magnitude 7.5), have impacted the Elk Hills reservoirs and oil and gas infrastructure. See Appendix E-1, Desktop Geohazards and Geotechnical Assessment and Appendix E-2, U.S. Environmental Protection Agency Class VI Underground Injection Control (UIC) Permit Application.

Induced seismicity as the result of CO_2 injection increasing underground pore pressure could also potentially disturb the storage formations and/or well integrity resulting in CO_2 leakage. There is no information currently available on such risks from CCS facilities comparable to the project. The risk of CO_2 releases may be increased by the proximity of other plugged and abandoned wells whose integrity potentially could be disturbed by induced seismicity, although the risk also may be reduced by the lower pore pressure in oil and gas reservoirs that have been depleted by previous extraction. CO_2 releases unrelated to seismic risk have occurred from other types of industrial facilities, pipelines and well failures, as described in Chapter 4.9, *Hazards and Hazardous Materials*.

The project site is located within an area where earthquakes have occurred in historic time. In 1857, a magnitude 7.9 earthquake was recorded approximately 30 miles northwest of the project site. In 1937, a magnitude 6.0 earthquake was recorded approximately 35 miles northwest of the project site. Smaller magnitude events are well documented within the project vicinity and surrounding region. An earthquake may disturb surface and/or subsurface facilities, possibly resulting in loss, injury, or death.

Impacts from seismic hazards are considered potentially significant without mitigation and Mitigation Measure (MM) 4.7-1 would be required to reduce these potential impacts to a less-than-significant level for this individual project impacts.

Mitigation Measures

MM 4.7-1 The owner/operator shall prepare a comprehensive seismic activity monitoring plan that includes connection to the Statewide seismic monitoring program California Integrated Seismic Network (CISN) The draft plan shall be submitted concurrently to all the following agencies: U.S. Environmental Protection Agency, Region 9, CISN, California Air Resources Board (CARB), Kern County Public Works and Kern County Planning and Natural Resources. The final plan shall be approved by CARB and include all requirements of State law including but not limited to: appropriate subsurface monitoring to ensure geologic sequestration of injected carbon dioxide; identification of hazards and conditions that may require

the suspension of carbon dioxide injections; notification protocols for all applicable agencies and emergency procedures. All requirements for seismic monitoring adopted by CARB – "Carbon Capture, Removal, Utilization and Storage Program" shall be implemented.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.7-2: Expose People or Structures to Substantial Adverse Effects, Including the Risk of Loss, Injury, or Death Involving Strong Seismic Ground Shaking

As described in Section 4.7.2, *Environmental Setting*, the San Andreas Fault Zone is located 10 miles to the west of the project site, and the Poso Creek Fault is located 25 miles to the east of the project site. Based on the proximity to active faults and magnitude of documented earthquakes within the region, strong ground shaking may occur at the project site. Information published by the USGS indicates the peak ground acceleration (PGA) with a 2 percent probability of being exceeded at the project site in 50 years is 40 to 80 %g, where "%g" is the percent acceleration due to gravity determined in accordance with the U.S. Seismic Hazard Maps web site. Given the proximity of the project site to overall seismic activity in the region, structures on the project site may be subject to strong ground shaking, which may result in structural damage. Structural damage to the facilities, overhead transmission lines, and other project components could potentially injure workers at the project site. Therefore, this impact is considered potentially significant. Mitigation of strong ground shaking, when needed, is typically provided by designing structures in accordance with the latest edition of the California Building Code.

Injection of fluids into deep geologic formations has the potential to cause fluid pressure buildup within fault zones, leading to an increase in seismic activity. Natural and induced seismic events have the potential to affect injection and monitoring wells and equipment. Because there are no known major faults within the project area, the proposed project activities are not expected to increase seismic activity and seismic activity is not expected to impact proposed project activities or facilities. Based on the project operating conditions, it is unlikely that injection operations would induce a seismic event outside a 10-mile radius around each injection well. The response plan from the Class VI Permit Application developed a portion for seismic events with an epicenter within a 10-mile radius of the injection wells, or natural events that have the potential to cause disruption to project operations.

Mitigation Measures

Implement MM 4.7-1, as described above.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.7-3: Expose People or Structures to Substantial Adverse Effects, Including the Risk of Loss, Injury, or Death Involving Seismic-related Ground Failure, Including Liquefaction

As noted above, there are no mapped areas that have Seismic Hazard Zones for liquefaction or landslides within the project area. Nevertheless, impacts from seismic-related ground failure would be considered potentially significant, and MM 4.7-1 would be required to reduce these potential impacts to a less-than-significant level.

Mitigation Measures

Implement MM 4.7-1, as described above.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.7-4: Directly or Indirectly Cause Substantial Adverse Effects, Including the Risk of Loss, Injury, or Death Involving Landslides

Strong shaking has the potential for activating landslides on hillsides; slope failures on creek banks; and, tension cracking in areas underlain by loose, low-density soil, such as extensive fill. As noted under Impact 4.7-2, strong ground shaking may occur at the project site. There are no known areas of extensive fill at the site and based on the predicted maximum horizontal accelerations at the site and the soil types identified in the preliminary report, the potential for ground failure was determined to be low to moderate at the site. As indicated above, no evidence of historic landslides or creep was observed within the project areas, and there is a low-to-moderate potential for rockfalls or landslides to impact the site in the event of a major earthquake. Therefore, the potential for landslides or other slope failures from earthquake-induced ground shaking in these areas is considered low.

During the construction of the project, destabilization of natural or constructed slopes could occur as a result of excavation and/or grading activities. Unmapped landslides and areas of localized slope instability may also be encountered. Excavation operations associated with facility construction and grading operations for temporary and permanent access roads and construction activities in areas of hilly or sloping terrain could result in slope instability, landslides, soil creep, or debris flows. Permanent slopes steeper than 5:1 (horizontal to vertical) or higher than 5 feet are not anticipated to be constructed or built upon for the project. Due to the existing topography and the proposed grading, landslides are not considered a potential hazard for the project site. Geotechnical studies conducted during the final siting of project infrastructure would identify site-specific geologic conditions, to be considered in infrastructure siting. Impacts from hazards associated with landslides would be potentially significant, and MM 4.7-2 would be required.

Mitigation Measures

MM 4.7-2 Operators shall avoid siting wells or accessory equipment and facilities on slopes greater than 30%.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.7-5: Result in Substantial Soil Erosion or Loss of Topsoil

Excavation and grading for facility installation, work areas, and access roads could loosen on-site soils or remove stabilizing vegetation and expose areas of loose soil. These areas, if not properly stabilized during construction, could be subject to increased soil loss and erosion by wind and stormwater runoff. As described in Section 4.7.2, *Environmental Setting*, soils at the project site are generally comprised of silty sand to clayey sand loams. Within the project site, erosion is an ongoing process that would continue primarily within existing drainage features where periodic flooding and sedimentation occur during and following periods of intense rainfall. As noted above, erosional drainage features were observed along or adjacent to some of the existing as well as to the proposed pipelines. Therefore, erosion is possible within or adjacent to stream channels and washes; however, as described in Section 4.10, *Hydrology and Water Quality*, the placement of project infrastructure as proposed is not expected to result in substantial erosion related to stormwater runoff.

In compliance with the CWA, as well as regulations of the State Water Resources Control Board, a SWPPP, which includes site-specific BMPs for erosion and sediment control, would be prepared and implemented for the project.

Prior to the issuance of any grading permit, the project proponent is required to submit a plan, prepared by a registered civil engineer or other professional, for the mitigation of potential soil erosion and sedimentation and submit it to the director of the Engineering, Surveying, and Permit Services Department for review and approval. At a minimum, the plan is required to include:

- Provisions for site revegetation, including any necessary re-soiling
- Proposed plant species
- Proposed plant density and percentage of ground coverage
- The methods and rates of plant seed application
- Sediment collection facilities.

Furthermore, the soil erosion and sedimentation control plan is to be consistent with the applicable requirements of the Regional Water Quality Control Board pertaining to the project's SWPPP.

In addition to the above, the revegetation portion of the soil erosion and sedimentation plan would be required to be prepared by a professional biologist or other professional and approved prior to

review and approval of the soil erosion and sedimentation plan by the County Engineering, Surveying, and Permit Services Department. The plan would include a timetable for full plan implementation, estimated costs, and a surety bond or other security as approved by the Engineering, Surveying, and Permit Services Department in an amount determined to guarantee plan implementation. The security would remain on file with the Engineering, Surveying, and Permit Services Department until the Department has verified that the plan has been successfully implemented.

Mitigation Measures

The project would implement stormwater mitigation measures, as described in Section 4.10, *Hydrology and Water Quality*.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.7-6: Be Located on a Geologic Unit or Soil That Is Unstable, or That Would Become Unstable as a Result of the Project, and Potentially Result in On- or Off-site Landslide, Lateral Spreading, Subsidence, Liquefaction, or Collapse

As noted above, the estimated depth to groundwater at the project site is 150 to 500 feet bgs, and the soils mapped at the site consist of sandy and clay loams. There are no mapped areas that have Seismic Hazard Zones for liquefaction or landslides within the project area. As noted above, the potential for seismically induced settlement, including liquefaction, is low to moderate at the project site (less than 50 percent probability within the next 100 years).

As previously discussed, lateral spreading typically occurs adjacent to free faces, such as slopes and creek channels. Considering the general topography of the terrain and the absence of liquefaction, the potential for lateral spreading to occur on the project site would be low.

Seismically induced settlement is dependent on the relative density of the subsurface soils. Most of the older alluvial soils are very dense, and the potential for these materials to settle due to seismic shaking is very low. The younger, looser soils would possibly have the greatest potential for seismically induced settlement. The proposed project will be exclusively used for CO_2 sequestration, and no fluids, aside from small-volume samples for monitoring, will be withdrawn from the sequestration zone, eliminating the possibility of subsidence caused by the project.

Soil volume changes can occur when expansive soils undergo alternating cycles of wetting (swelling) and drying (shrinking). Soils mapped on the project site are primarily alluvial and are not considered hydric soils. Therefore, soils on the project site exhibit a low probability of shrink-swell patterns or expansive characteristics. The design-level geotechnical investigation will determine the expansive potential of the underlying soil at the project site and any mitigation measures required. The geotechnical investigation for soils at the project site would be conducted

prior to the final design and approval of the project and would be used in determining the final siting of project infrastructure.

As described above, seismic-related ground failure may result in surface rupture near or on the project site. Such event(s) could potentially result in damage to project facilities/structures, introducing the potential to subsequently result in on- or off-site landslide, liquefaction, or collapse. Impacts from seismic-related ground failure would be considered potentially significant. To avoid such an occurrence, implementation of MM 4.7-3 would require a geotechnical evaluation to avoid locating project infrastructure on unstable or potentially unstable geologic units or soils.

Mitigation Measures

MM 4.7-3 The owner/operator shall implement all requirements of a site-specific geotechnical report.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.7-7: Be Located on Expansive Soil, as Defined in Table 18-1-B of the Uniform Building Code (1994), Creating Substantial Risks to Life or Property

Soils mapped on the project site are primarily alluvial and include Kimberlina fine sandy loam with 0 to 9 percent slopes, Milham sandy loam with 0 to 5 percent slopes, and Panoche clay loam with 0 to 5 percent slopes. These soils are not considered hydric soils. The majority of the soils on the project site are the Panoche clay loam, which are described as very deep, nearly level to moderately sloping, and well drained. Some of the soils in the project area have a clay fraction and may be expansive. Therefore, soils on the project site exhibit probability for shrink–swell patterns, or expansive characteristics. As previously noted, a geotechnical investigation for soils at the project site would be conducted prior to the final design and approval of the project and would be used in determining the final siting of project infrastructure. This impact is, therefore, considered to be potentially significant, and implementation of MM 4.7-4 is required to reduce impacts to a less-than-significant level.

Mitigation Measures

MM 4.7-4 The owner/operator s shall avoid building infrastructure on expansive soil, unless the owner/operator determines that CCS injection facilities are infeasible from a different location, and site-specific Professional Engineering certification is submitted concluding that the new equipment will not cause substantial risks to life or property. The site-specific Professional Engineering certification must be submitted and reviewed by the Kern County Public Works Department and a memo provided that agrees that construction and operation of new equipment will not cause substantial risks to life or property as determined through established

engineering standards. All recommendations required by the approved engineering certification from Kern County Public Works shall be implemented.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.7-8: Have Soils Incapable of Adequately Supporting the Use of Septic Tanks or Alternative Wastewater Disposal Systems Where Sewers Are Not Available for the Disposal of Wastewater

As described in Section 3.4, *Proposed Project Characteristics*, of this EIR, existing available domestic water and septic systems are available at existing buildings. New septic systems or holding tanks would be installed in the new control rooms. Such structures would be located away from surface drainages and protected from potential surface runoff. If located in older alluvial soils, leach line wastewater infiltration would be slow due to the dense soils, while the younger alluvial, sandy soils would experience moderate to fast wastewater infiltration. Proper siting and design would minimize the potential for a health impact from flooding. The on-site septic system and leach field would be constructed to comply with applicable requirements of the Kern County Public Health Services Department. This impact is, therefore, considered to be less than significant, and implementation of MM 4.7-3 would be used to reduce any impacts.

Mitigation Measures

Implement MM 4.7-3, as described above.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.7-9: Directly or Indirectly Destroy a Unique Paleontological Resource or Site or Unique Geologic Feature, as Defined in CEQA Guidelines Section 15064

Geologic mapping indicates the surface of the project site consists of two geologic units: younger alluvium and the Tulare Formation. These geologic units range in age from the Holocene to the Pliocene. The alluvial sediments present at the project site date to the Holocene, which ranges from the present to 11,700 years old. As defined by the Society for Vertebrate Paleontology's Professional Standards, paleontological resources must be over 5,000 years in age, corresponding to the middle part of the Holocene. Therefore, the alluvial sediments in the project site are too young at the surface to preserve paleontological resources and should be considered to have low paleontological potential. The Tulare Formation present at the project site dates to the Pleistocene and possibly to the Pliocene. Given the extensive record of significant fossil localities in the Tulare Formation, some in the vicinity of the project site, the Tulare Formation is assessed as having high paleontological potential.

The high paleontological potential of the Tulare Formation suggests that the construction of the proposed project may result in impacts on paleontological resources. Any proposed excavation activities that extend deep enough to encounter previously undisturbed strata of this geologic unit (i.e., grading, borehole auguring, trenching, or other miscellaneous excavations that extend below the depth any previously imported artificial fill or disturbed sediments present within the project area) have the potential to impact the paleontological resources preserved therein. If encountered, disturbance of significant fossils would result in a potentially significant impact on paleontological resources. However, with the implementation of MM 4.7-5 through MM 4.7-6, which would require Paleontological Resources Awareness Training for construction workers, use of a qualified paleontological monitor during construction activities, and appropriate treatment of accidentally uncovered paleontological resources, impacts to paleontological resources would be reduced to less than significant.

Mitigation Measures

MM 4.7-5 As part of any Worker Environmental Awareness Program training, all construction personnel shall be trained regarding the recognition of possible uncovered paleontological resources and protection of paleontological resources during construction, prior to the initiation of construction or ground-disturbing activities. Training shall inform construction personnel of the procedures to be followed upon the discovery of paleontological materials. All personnel shall be instructed that unauthorized collection or disturbance of fossils is unlawful.

MM 4.7-6 Prior to commencement of any work on project wells, capture facilities or facility pipeline a mitigation fee of $10,000 shall be paid to the Buena Vista Museum to fund the continued education and curation of paleontological resources and provide educational support regarding the paleontological history of the region.

Level of Significance after Mitigation

Impacts would be less than significant.

4.7.5 Cumulative Setting, Impacts, and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present, and reasonably foreseeable future oil and gas development including wells and abandonment activity to implement carbon capture and storage projects constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; an SREIR certified on March 8, 2021; and an

Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The documents provide a projection of future production county wide over 25 years of 3,649 new wells countywide per year of various types (production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 other wells (cyclic wells, SB 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for 8 years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1200 per year) since February 2021. The California Geologic Energy Management Division (CalGEM) permitting for all wells with the exception of plugging and abandonments has never averaged over 2,000 permits a year (as implementation in some years of the County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts on geology and soils is considered the entire known and potential areas of geographic reservoirs that could be permitted to store CO_2. Those reservoirs have been identified theoretically in the Lawrence Livermore National Lab Report "Getting to Neutral; Options for Negative Carbon Emissions in California" (Stark 2020). The State of California Department of Conservation Geologic Carbon Sequestration Group is undertaking further delineation to identify a variety of sites in California. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects*, would have on geology, specifically seismic activity and soils reservoir.

Impact 4.7-10: Contribute to Cumulative Geologic and Soils Impacts

Seismic Activity

With regard to the project's potential to expose people or structures to hazards associated with the rupture of a known earthquake fault or from strong seismic ground shaking (Impacts 4.7-1 and 4.7-2), damage to associated project facilities could occur from direct rupture of a fault in the project site. During such an earthquake, structural damage to associated facilities from the project could potentially injure workers at the site. The project would implement MM 4.7-1, which requires the preparation of a comprehensive seismic activity monitoring plan, thus reducing the project's impacts.

With regard to the project's potential to expose people or structures to hazards associated with seismic-related ground failure, including liquefaction (Impact 4.7-3), it is possible that ground rupture and/or failure could occur in the project site through cumulative impacts from the future CCS projects in the San Joaquin Valley and specifically the county and that such an event could result in damage to project infrastructure and potentially those located off site. MM 4.7-1 requires a comprehensive seismic monitoring and management plan that includes, but is not limited to, appropriate subsurface monitoring to ensure geologic sequestration of injected CO_2; identification of hazards and conditions that may require the suspension of CO_2 injections; and notification protocols for all applicable agencies and emergency procedures. All requirements for seismic monitoring adopted by the CARB Carbon Capture, Removal, Utilization, and Storage Program shall also be implemented.

Connection to the CISN statewide seismic monitoring program is a requirement of SB 905, and all projects would be required to connect. The CISN program would be able to detect even small seismic events for all CCS projects and evaluate the significance of those events individually and cumulatively and recommend to the CARB that injection be paused. Leak detection monitoring is also required at the injection well sites as well as a comprehensive monitoring well system. Evaluations of the project from even very small earthquake events that cannot be felt by surrounding communities would be detected, reported, and evaluated against any potential leaks detected. As noted in the evidence in the record on seismic activities related to oil and gas exploration and extraction in Chapter 4.6, Geology and Soils, of the Oil and Gas EIR, project activities of hydraulic fracturing and deep wastewater injection have limited potential to induce seismic activities. There are no cases where strong seismic shaking (greater than 4.0) has occurred as a result of induced seismicity. In California, there is a limited case history with respect to induced seismicity from hydraulic fracturing or historical wastewater injection. Neither of these activities would be authorized within the project's subsurface CO_2 storage reservoir. The National Academy of Sciences found that the "potential for felt seismicity due to secondary recovery and EOR [enhanced oil recovery] is low" and that hydraulic fracturing as presently implemented "does not pose a high risk for induced felt seismic events in California" (NAS 2013). EOR is prohibited by SB 905 to be conducted on the CCS site or for the CO_2 collected and injected to be used anywhere for EOR. In addition, the California Council on Science and Technology concluded current hydraulic fracturing activity is not considered to pose a significant seismic hazard in California (CCST 2014). Under directions from the governor's office, CalGEM has ceased processing and issuing permits for hydraulic fracturing since April 2021 and was directed to create regulations to end all permitting for such well treatments in January 2024. The matter is under litigation. CalGEM regulates the operation of injection wells to minimize effects on people. Over-pressuring of injected zones is controlled by operating all injection wells under State permitting control according to California Code of Regulations Title 14, Division 2, Chapter 4, Subchapter 1, Article 3 Requirements. The UIC Class VI wells for this project would in a similar fashion be managed by the U.S. Environmental Protection Agency to prevent over-pressuring the zones.

Although there is no evidence in the record that the cumulative impacts of current oil and gas activities are causing significant, strong seismic events, the conclusions for seismic activity for injection of CO_2 into formations for multiple CCS projects in the same county is based on science modeling and has not been validated in real-world projects. The CISN has over 23 years of

experience with the detection and reporting of seismic events. The monitoring equipment has progressed to a sensitivity stage where the Statewide Early Warning System can detect that an earthquake is starting and send an alert to cell phones seconds before it occurs (Burkett et al. 2014). Such detection can ensure that injection activities can be stopped in anticipation of an event if needed. The issue of induced seismicity, while understood and modeled, contains uncertainty for multiple active projects. Other CCS projects in the region would be evaluated under CEQA with individual site-specific EIRs and individual UIC permitting to ensure the area of review is appropriate with limits on quantities and characteristics of the CO_2 injected. However, due to the uncertainty of the implementation of multiple projects and the ability to simultaneously cease injection during an event, the impacts from cumulative induced seismic activity from this project plus any future permitted CCS project is significant and unavoidable, even with the monitoring and actions of MM 4.7-1 and there are no other feasible and reasonable mitigations available.

Mitigation Measures

Implement MM 4.7-1 to MM 4.-7-6, as described above.

Level of Significance after Mitigation

Cumulative impacts for potential induced seismic activity are significant and unavoidable.

Landslides

With regard to the project's potential to expose people or structures to hazards associated with landslides, strong shaking has the potential for activating landslides on hillsides; slope failures on creek banks; and tension cracking in areas underlain by loose, low-density soil (Impact 4.7-4). During the construction of the project, destabilization of natural or constructed slopes could occur as a result of excavation and/or grading activities. The project would implement MM 4.7-2, where wells and accessory equipment shall not be sited on slopes greater than 30 percent, thus reducing any associated impacts. Additionally, none of the cumulative projects identified in Section 3.9, *Cumulative Projects*, are located on the portions of the project site that consist of steep slopes. Therefore, project impacts would not have the potential to combine with similar impacts of past, present, or reasonably foreseeable projects to result in a cumulative impact. The cumulative projects listed in Section 3.9, *Cumulative Projects*, would be required to comply with the goals, policies, and implementation measures of applicable laws, regulations, and required standards. Should potential geologic- and soil-related impacts be identified, compliance with applicable legal requirements is required, and additional mitigation could also be required for cumulative projects subject to CEQA or the National Environmental Policy Act.

Mitigation Measures

Implement MM 4.7-1 through MM 4.7-6, as described above**.**

Level of Significance after Mitigation

Cumulative impacts would be less than significant.

Soil Hazards

With regard to the project's potential to result in substantial soil erosion or loss of topsoil (Impact 4.7-5), erosion is an ongoing process that would continue primarily within existing drainage features. As previously detailed, the potential for erosion is considered to be moderate to high within or adjacent to stream channels and washes. The placement of project infrastructure as proposed would not be expected to result in substantial erosion related to stormwater runoff. The project would be required to implement a SWPPP, which would include site-specific BMPs for erosion and sediment control, reducing potential cumulative impacts to a less-than-significant level.

Mitigation Measures

The project would implement stormwater mitigation measures, as described in Section 4.10, *Hydrology and Water Quality*.

Level of Significance after Mitigation

Cumulative impacts would be less than significant.

With regard to the project's potential to place infrastructure on soil that is unstable or expansive (Impacts 4.7-6 and 4.7-7), the majority of on-site soils are coarser grained, and the fines are typically non-plastic. These types of soils do not exhibit shrink-swell patterns and are not considered expansive soils. Implementing MM 4.7-3 and MM 4.7-4 would reduce this potential impact to less-than-significant levels. Geotechnical assessments at the project site would be conducted prior to construction to ensure that soils are suitable for the placement of project infrastructure. Therefore, these impacts would not have the potential to combine with similar impacts of past, present, or reasonably foreseeable projects to result in a cumulative impact.

Mitigation Measures

Implement MM 4.7-1 to MM 4.-7-6, as described above.

Level of Significance after Mitigation

Cumulative impacts would be less than significant.

With regard to the project's potential to be located on soils incapable of adequately supporting the use of septic tanks (Impact 4.7-8), the project proposes to install an engineered septic system for the new control room building. MM 4.7 -3 requires a geotechnical report and the engineered septic system is required to comply with applicable requirements of the Kern County Public Health Services Department. There is no evidence in the record that septic systems in the oilfield area

have caused any issues and there are no residential subdivisions within the oilfields that would contribute to cumulative impacts. Therefore, these impacts would not have the potential to combine with similar impacts of past, present, or reasonably foreseeable projects to result in a cumulative impact.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Cumulative impacts would be less than significant.

Paleontological Resources

With regard to the project's impacts on unique paleontological resources (Impact 4.7-9), the project would not contribute significantly to cumulative impacts within the region. Paleontological resources are generally not considered subject to cumulative impacts because they are localized and site-specific and are either individually impacted in a way that changes the significance of the resource or are avoided, including in the Tulare Formation.

Although significant fossils may be discovered during excavation for construction, through the implementation of MM 4.7-5 through MM 4.7-6, direct impacts on paleontological resources would be reduced to a level that is less than significant. Paleontological resources are generally not considered subject to cumulative impacts because they are localized and site-specific and are either individually impacted in a way that changes the significance of the resource or are avoided. In addition, the other projects identified in Section 3.9, *Cumulative Projects*, would also be expected to reduce potential impacts on paleontological resources to a less-than-significant level through avoidance or mitigation and, therefore, would not contribute to a significant cumulative impact. Therefore, the impacts of the project would not have the potential to combine with impacts from past, present, or reasonably foreseeable projects to result in a cumulative impact on paleontological resources and cumulative impacts would be less than significant.

Mitigation Measures

Implement MM 4.7-1 to MM 4.7-6 as described above.

Level of Significance after Mitigation

Cumulative impacts would be less than significant.

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Section 4.8

Greenhouse Gas Emissions

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Section 4.8
Greenhouse Gas Emissions

4.8.1 Introduction

This section describes the affected environment and regulatory setting for greenhouse gas (GHG) emissions and global climate change. It also describes the impacts on GHG that would result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers) southwest of the community of Lost Hills and west of State Route (SR) 33.

Information contained within this section was primarily provided by the Air Quality Impact Analysis prepared by Trinity Consultants (Trinity 2023) and included as Appendix B-1 of this Draft Environmental Impact Report (EIR).

A description of the environmental setting (affected environment) for GHG and Global Climate Change is presented in Section 4.8.2, *Environmental Setting*. The regulatory setting applicable to GHG-related impacts is presented in Section 4.8.3, *Regulatory Setting*, and Section 4.2.4, *Impacts and Mitigation Measures,* discusses project impacts and associated Mitigation Measures.

4.8.2 Environmental Setting

The project site is located within the Central Valley portion of unincorporated Kern County and is comprised of 45 parcels within the administrative boundaries of the Belridge oilfields. The Belridge oilfields are contiguous and located west of SR 33, approximately 7 miles southwest of the community of Lost Hills (population 2,370). Together, the Belridge oilfields cover an area of approximately 13 miles long and 3 miles wide. Aera Energy is the primary operator within both oilfields.

GHGs and climate change are a cumulative global issue. The California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (EPA) regulate GHG emissions within the State of California and the United States, respectively. While CARB has the primary regulatory responsibility within California for GHG emissions, local agencies can also adopt policies for GHG emission reduction. CARB has divided California into regional air basins. The project is located within Kern County's (County's) portion of the San Joaquin Valley Air Basin (SJVAB). Kern County is included among the eight counties that make up the San Joaquin Valley Air Pollution Control District (SJVAPCD).

Climate

The most significant single control on the weather pattern of the San Joaquin Valley is the semi-permanent subtropical high-pressure cell, referred to as the "Pacific High." During the summer, the Pacific High is positioned off the coast of northern California, diverting ocean-derived storms to the north. Hence, the summer months are virtually rainless. During the winter, the Pacific High moves southward allowing storms to pass through the San Joaquin Valley. Almost all of the precipitation expected during a given year occurs from December through April. During the summer, the predominant surface winds are out of the northwest. Air enters the San Joaquin Valley through the Carquinez Strait and flows toward the Tehachapi Mountains. This up-valley (northwesterly) wind flow is interrupted in early fall by the emergence of nocturnal, down-valley (southeasterly) winds which become progressively more predominant as winter approaches. Wind speeds are generally highest during the spring and lightest in fall and winter. The relatively cool air flowing through the Carquinez Strait is warmed on its journey south through the San Joaquin Valley. On reaching the southern end of the San Joaquin Valley, the average high temperature during the summer is nearly 100 degrees Fahrenheit (°F). Relative humidity during the summer is quite low, causing large diurnal temperature variations. Temperatures during the summer often drop into the upper 60s. In winter, the average high temperatures reach the mid-50s and the average low drops to the mid-30s. In addition, another high-pressure cell, known as the "Great Basin High," develops east of the Sierra Nevada Mountain Range during winter. When this cell is weak, a layer of cool, damp air becomes trapped in the basin, and extensive fog results. During inversions, vertical dispersion is restricted, and pollutant emissions are trapped beneath the inversion and pushed against the mountains, adversely affecting regional air quality. Surface-based inversions, while shallow and typically short-lived, are present most mornings. Elevated inversions, while less frequent than ground-based inversions, are typically longer lasting and create more severe air stagnation problems. The winter season characteristically has the poorest conditions for vertical mixing of the entire year.

Meteorological data for various monitoring stations is maintained by the Western Regional Climate Center. Meteorological data for the project site is expected to be similar to the data recorded at the Buttonwillow monitoring station. This data is provided in Table 4.8-1, which contains average precipitation data recorded at the Buttonwillow monitoring station. Over the 115-year period from January 1901 through June 2016 (the most recent data available), the average annual precipitation was 5.64 inches (WRCC 2023).

Table 4.8-1: Buttonwillow Weather Data

Period of Record Monthly Climate Summary for the Period 01/05/1901 to 6/10/2016													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Avg. Maximum Temp (F)	56.4	63.2	69.1	76.0	84.7	92.4	98.4	96.7	91.7	81.4	67.4	57.2	77.9
Avg. Minimum Temp (F)	35.2	39.0	43.0	47.2	54.1	60.1	65.3	63.3	57.9	48.8	39.2	34.5	49.0
Average Total Precipitation (in.)	1.06	1.07	0.97	0.55	0.21	0.05	0.02	0.02	0.12	0.27	0.55	0.75	5.64
Average Snowfall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent of possible observations for period of record: Max. Temp.: 99.1% Min. Temp.: 99.1% Precipitation: 98.8% Snowfall: 99.2% Snow Depth: 99.2%													
Source: Western Regional Climate Center, 2023.													

Global Climate Change

"Global climate change," often used interchangeably with "global warming," refers to changes in average meteorological conditions on the earth with respect to temperature, precipitation, and storms, lasting for decades or longer. Climate change may result from the following influences:

- Natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun
- Natural processes within the climate system (for example, changes in ocean circulation)
- Human activities that change the atmosphere's composition (for example, through burning fossil fuels) and the land surface (for example, deforestation, reforestation, urbanization, and desertification)

As determined from worldwide meteorological measurements between 1990 and 2005, the primary observed effect of global climate change has been a rise in the average global tropospheric temperature of 0.36°F per decade. Climate change modeling shows that further warming could occur, which could induce additional changes in the global climate system during the current century. Changes to the global climate system, ecosystems, and the environment of California could include higher sea levels, drier or wetter weather, changes in ocean salinity, changes in wind patterns, or more energetic aspects of extreme weather (for example, droughts, heavy precipitation, heat waves, extreme cold, and increased intensity of tropical cyclones). Specific effects from climate change in California may include a decline in the Sierra Nevada snowpack, erosion of California's coastline, and seawater intrusion in the Sacramento-San Joaquin River Delta.

Human activities, including fossil fuel combustion and land use changes, release carbon dioxide (CO_2) and other compounds cumulatively termed GHGs. GHGs are effective at trapping radiation that would otherwise escape the atmosphere. This trapped radiation warms the atmosphere, the oceans, and the earth's surface. Many scientists believe "most of the warming observed over the last 50 years is attributable to human activities." The increased amount of CO_2 and other GHGs in the atmosphere is the alleged primary result of human-induced warming.

Greenhouse Gases

Constituent gases that trap heat in the earth's atmosphere are called GHGs, analogous to the way a greenhouse retains heat. GHGs play a critical role in the earth's radiation budget by trapping infrared radiation emitted from the earth's surface, which would otherwise escape into space. Without the natural heat-trapping effect of GHGs, the earth's surface would be about 34°F cooler (CAT 2006). This natural phenomenon, known as the "greenhouse effect," is therefore responsible for maintaining a habitable climate.

The standard definition of GHGs includes six substances identified in the Kyoto Protocol – CO_2, methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)—plus chlorofluorocarbons (CFCs) and other chlorine or bromine-containing gases phased out under the Montreal Protocol.

Some GHGs, including CO_2, CH_4, and N_2O, are present in the atmosphere naturally, released by natural sources, or formed from secondary reactions taking place in the atmosphere. In the last 200 years, substantial quantities of GHGs have been released into the atmosphere, primarily from fossil fuel combustion. These human-induced emissions are increasing GHG concentrations in the atmosphere, therefore enhancing the natural greenhouse effect. The GHGs resulting from human activity are believed to be causing global climate change. From the pre-industrial era (that is, ending about 1750) to 2021, concentrations of CO_2, CH_4, and N_2O have increased globally by 48.1, 170.8, and 23.8 percent, respectively (EPA 2023a). While human-made GHGs include naturally present substances like CO_2, CH_4, and N_2O, some (like CFCs) are completely new to the atmosphere.

GHGs vary considerably in terms of global warming potential (GWP), the comparative ability of each GHG to trap heat in the atmosphere. The GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and the length of time that the gas remains in the atmosphere (atmospheric lifetime). The GWP of each gas is measured relative to CO_2, the most abundant GHG. The definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of "CO_2 equivalents" (CO_2e).

The principal GHGs resulting from human activity that enter and accumulate in the atmosphere are described below.

- **Carbon Dioxide (CO_2)** is a colorless, odorless gas consisting of molecules made up of two oxygen atoms and one carbon atom. CO_2 is produced when an organic carbon compound (such as wood) or fossilized organic matter, (such as coal, oil, or natural gas) is burned in the presence of oxygen. CO_2 is removed from the atmosphere by CO_2 "sinks," such as absorption by seawater and photosynthesis by ocean-dwelling plankton and land plants, including forests and grasslands. However, seawater is also a source of CO_2 in the atmosphere, along with land plants, animals, and soils, when CO_2 is released during respiration. Whereas the natural production and absorption of CO_2 is achieved through the terrestrial biosphere and the ocean, humankind has altered the natural carbon cycle by

burning coal, oil, natural gas, and wood. Since the industrial revolution began in the mid-1700s, each of these activities has increased in scale and distribution.

- **Methane (CH_4)** is a colorless, odorless nontoxic gas consisting of molecules made up of four hydrogen atoms and one carbon atom. CH_4 is combustible, and it is the main constituent of natural gas—a fossil fuel. CH_4 is also released when organic matter decomposes in low-oxygen environments. Natural sources include wetlands, swamps and marshes, termites, and oceans. Human sources include the mining of fossil fuels and transportation of natural gas, digestive processes in ruminant animals such as cattle, rice paddies, and the buried waste in landfills. Over the last 50 years, human activities, such as growing rice, raising cattle, using natural gas, and mining coal, have added to the atmospheric concentration of CH_4. Other anthropogenic sources include fossil fuel combustion and biomass burning.
- **Nitrous Oxide (N_2O)** is a colorless, nonflammable gas with a sweetish odor, commonly known as "laughing gas," and sometimes used as an anesthetic. N_2O is naturally produced in the oceans and in rainforests. Man-made sources of N_2O include the use of fertilizers in agriculture, nylon and nitric acid production, cars with catalytic converters, and the burning of organic matter. Concentrations of N_2O also began to rise at the beginning of the Industrial Revolution.
- **Chlorofluorocarbons (CFCs)** are gases formed synthetically by replacing all hydrogen atoms in CH_4 or ethane with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). CFCs have no natural source but were first synthesized in 1928. They were used for refrigerants, aerosol propellants, and cleaning solvents. Because of the discovery that they are able to destroy stratospheric ozone, an ongoing global effort to halt their production was undertaken and has been extremely successful, so much so that levels of the major CFCs are now remaining steady or declining. However, their long atmospheric lifetimes mean that some of the CFCs will remain in the atmosphere for over 100 years.
- **Sulfur Hexafluoride (SF_6)** is an extremely potent GHG. SF_6 is very persistent, with an atmospheric lifetime of more than a thousand years. Thus, a relatively small amount of SF_6 can have a significant long-term impact on global climate change. SF_6 is human-made, and the primary user of SF_6 is the electric power industry. Because of its inertness and dielectric properties, it is the industry's preferred gas for electrical insulation, current interruption, and arc quenching (to prevent fires) in the transmission and distribution of electricity. SF_6 is used extensively in high-voltage circuit breakers and switchgear, and in the magnesium metal casting industry.
- **Hydrofluorocarbons (HFCs)** are synthesized chemicals that are used as a substitute for CFCs. Out of all of the GHGs, HFCs are one of three groups with the highest GWP. HFCs are synthesized for applications such as automobile air conditioners and refrigerants.
- **Perfluorocarbons (PFCs)** have stable molecular structures and do not break down through the chemical processes in the lower atmosphere. Because of their molecular stability, PFCs

have very long lifetimes, between 10,000 and 50,000 years. The two main sources of PFCs are primary aluminum production and semiconductor manufacture.

Greenhouse Gas Emissions Inventories

The EPA releases an annual GHG inventory that tracks U.S. GHG emissions and sinks by source, economic sector, and GHG going back to 1990. In 2021, U.S. GHG emissions totaled 6,340.2 million metric tons (MMT) of CO_2e, or 5,586.0 MMT CO_2e after accounting for sequestration (also referred to as "storage"; these terms are used synonymously throughout the regulatory landscape) from the land sector. Overall, net emissions increased 6.4 percent from 2020 to 2021 and decreased 16.6 percent from 2005 levels. In 2021, CO_2 emissions from fossil fuel combustion were 4,639.1 MMT CO_2e, or 1.9 percent below emissions in 1990. The transportation sector accounted for 28 percent of 2021 GHG emissions, the electric power industry accounted for 25 percent, the industrial sector accounted for 23 percent, commercial and residential accounted for 13 percent, and agriculture accounted for 10 percent (EPA 2023a).

CARB is responsible for developing and maintaining the California GHG emissions inventory. This inventory estimates the amount of GHG emitted into and removed from the atmosphere by human activities within the state of California and supports the Assembly Bill (AB) 32 Climate Change Program. CARB's current GHG emission inventory covers the years 2000 through 2020 and is based on fuel use, equipment activity, industrial processes, and other relevant data (for example, housing, landfill activity, and agricultural lands).

In 2020, statewide GHG emissions (in-state sources and imported electricity) were 369.2 MMT CO_2e, which is 35.3 MMT CO_2e lower than 2019 levels and 61.8 MMT CO_2e below the 2020 GHG Limit of 431 MMT CO_2e (CARB 2022a). Per capita GHG emissions in California have decreased 33 percent from a 2001 peak of 13.8 metric tons (MT) per person to 9.3 MT per person in 2020. CARB noted that the 2019 to 2020 decrease in emissions is likely due in large part to the impacts of the COVID-19 pandemic and economic recovery may result in emissions increases over the next few years. As such, the total 2020 reported emissions are likely an anomaly and any near-term increases in annual emissions should be considered in the context of the pandemic.

CARB's inventory shows that the transportation sector was the source of approximately 37 percent of California's GHG emissions in 2020, followed by industrial sources at 20 percent and electricity generation at 16 percent. Other sources of GHG emissions were residential plus commercial activities at 11 percent, agriculture at 9 percent, high global warming potential gases at 6 percent, and recycling and waste at 2 percent (CARB 2022a).

Effects of Global Climate Change

Changes in the global climate are assessed using historical records of temperature changes that have occurred in the past to extrapolate a level of statistical significance specifically focusing on temperature records from the last 150 years (the Industrial Age) that differ from past climate changes in rate and magnitude.

Several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts were constructed by the Intergovernmental Panel on Climate Change (IPCC). In the IPCC Fifth Assessment Report, it was predicted that the global mean temperature change from 1990 to 2100 could range from 1.1 degree Celsius (°C) to 6.4 °C (8 to 10.4 °Fahrenheit). Under all scenarios, global average temperatures and sea levels are expected to rise. It was concluded that global climate change was largely the result of human activity, mainly the burning of fossil fuels.

Effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme weather events, and degradation of air quality. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems. Heat-related problems include heat rash and heat stroke, and drought. In addition, climate-sensitive diseases may increase, such as those spread by mosquitoes and other disease-carrying insects. Such diseases include malaria, dengue fever, yellow fever, and encephalitis. People and agriculture can be displaced by extreme events such as flooding and hurricanes. Air quality problems may also result from global warming due to an increased frequency of smog and particulate air pollution.

It was concluded that several climate change effects can be expected in California over the course of the next century by the 2006 California Climate Action Team (CAT) Report. Trends established by the IPCC that the CAT used to make this prediction are detailed in the Air Quality Impact Analysis (Appendix B-1), including but not limited to a diminishing Sierra snowpack, a rise in sea levels, an increase in temperature and extreme weather events, an increased risk of large wildfires, an increase in forest vulnerability, a reduction in the quality and quantity of agricultural products, an exacerbation of air quality problems, a decrease in the health and productivity of California forests, an increase in electricity demand, and an increase in ground-level ozone formation.

4.8.3 Regulatory Setting

In 1988, the IPCC was established to evaluate the impacts of global warming and to develop strategies that nations could implement to curtail global climate change. In 1992, an agreement with the goal of controlling GHG emissions was established by the United Nations Framework Convention on Climate Change. As a result, the Climate Change Action Plan was developed to address the reduction of GHGs in the United States. The plan consists of more than 50 voluntary programs. Additionally, the Montreal Protocol was originally signed in 1987 and substantially amended in 1990 and 1992. The Montreal Protocol stipulates that the production and consumption of compounds that deplete ozone in the stratosphere (CFCs, halons, carbon tetrachloride, and methyl chloroform) were phased out by 2000 (methyl chloroform was phased out by 2005).

In addition to these voluntary commitments and programs, many regulations have been adopted at the federal, state, and local levels to quantify and reduce GHG emissions. Descriptions of those relevant to the project are presented in the following sections.

Although global warming and climate change have received substantial public attention for more than 20 years, the analytical tools have not been developed to determine the effect of worldwide

global warming from a particular increase in GHG emissions, or the resulting effects on climate change in a particular locale. The scientific tools needed to evaluate the impacts that a specific project may have on the environment are even further in the future.

Federal

U.S. Environmental Protection Agency

The principal air quality regulatory mechanism at the federal level is the Clean Air Act (CAA) and in particular, the 1990 amendments to the CAA and the National Ambient Air Quality Standards that it establishes. The EPA is responsible for implementing federal policy to address GHGs. On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the CAA. The EPA adopted a Final Endangerment Finding for the six defined GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6), which was required before the EPA could regulate GHG emissions under Section 202(a)(1) of the CAA. The EPA also adopted a Cause or Contribute Finding in which the EPA Administrator determined that GHG emissions from new motor vehicle and motor vehicle engines contribute to air pollution, which endangers public health and welfare. These findings do not themselves impose any requirements on industry or other entities. However, these actions were a prerequisite for implementing GHG emissions standards for vehicles. There are currently no federal regulations that set ambient air quality standards for GHGs.

Mandatory Reporting of Greenhouse Gases Rule (40 CFR Part 98)

This rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 MT CO_2e emissions per year (40 Code of Federal Regulations [CFR] Part 98). The project would not be expected to trigger GHG reporting according to the rule.

Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule (40 CFR Part 52)

GHG emissions from the largest stationary sources were, for the first time, covered by the Prevention of Significant Deterioration (PSD) and Title V Operating Permit Programs beginning on January 2, 2011. The EPA's GHG Tailoring Rule, issued in May 2010, established a common sense approach to permitting GHG emissions under PSD and Title V. In June 2014, the U.S. Supreme Court ruled that the EPA cannot classify a facility as a major PSD or Title V source based solely on its GHG emissions meeting the major source threshold. However, the Supreme Court said that the EPA could continue to require that PSD permits, required due to criteria pollutant emissions, contain limitations on GHG emissions based on the application of Best Available Control Technology (EPA 2023b). The project would not be expected to trigger PSD permitting as required by this regulation.

National Climate Action Plan

In 2021, EPA released its "US EPA's Climate Action Plan: October 2021" in response to Executive Order (EO) 14008 (EPA 2021). EO 14008, entitled "Tackling the Climate Crisis at Home and Abroad" (January 2021) calls for a government-wide approach to the climate crisis that reduces

climate pollution in every sector of the economy; increases resilience to the impacts of climate change; protects public health; conserves our lands, waters, and biodiversity; delivers environmental justice; and spurs well-paying jobs and economic growth, especially through innovation, commercialization, and deployment of clean energy technologies and infrastructure. The EPA intends to formalize its policy on adaptation with the revision of Department Manual Part 523 – Climate Change Adaptation. The policy will provide guidance to Bureaus and Offices for addressing climate change impacts on the EPA's mission, programs, operations, and personnel.

Fuel Efficiency Standards for Construction Equipment

The federal government sets fuel efficiency standards for non-road diesel engines that are used in construction equipment. The regulations, contained in 40 CFR Parts 1039, 1065, and 1068, include multiple tiers of emission standards. Most recently, the EPA adopted a comprehensive national program to reduce emissions from non-road diesel engines by integrating engine and fuel controls as a system to gain the greatest reductions. To meet these Tier 4 emission standards, engine manufacturers will produce new engines with advanced control technologies.

Oil and Natural Gas Air Pollution Standards (40 CFR Parts 60 and 63)

Air pollution standards established by the EPA under the New Source Performance Standard, Final Rule August 16, 2012, for oil and gas production require companies to provide notifications of oil and natural gas well completions. Amendments effective August 2, 2016, include standards for GHG emissions (in the form of limitations on CH_4) and standards for volatile organic compounds (VOCs) and sulfur dioxide emissions. The standards apply across a variety of emission sources in the oil and natural gas source category (i.e., production, processing, transmission, and storage) that are constructed, modified, or reconstructed after September 18, 2015. Annual reporting is also required by this rule.

State

A variety of statewide rules and regulations have been implemented or are in development in California that mandate the quantification or reduction of GHGs. Several gubernatorial EOs establish statewide GHG reduction goals. As a result of Senate Bill (SB) 97, the California Environmental Quality Act (CEQA) requires an analysis and mitigation of emissions of GHGs and climate change in relation to a proposed project, where a project will result in a significant increase of GHG emissions. Certain Air Pollution Control Districts have proposed their own levels of significance. See the discussion of SJVAPCD significance thresholds in Section 4.8.4, *Impacts and Mitigation Measures*.

Executive Order S-1-07

EO S-1-07 recognizes that the main source of GHG emissions in California is the transportation sector and establishes a goal to reduce the carbon intensity of transportation fuels sold in California by at least 10 percent by 2020. As a result of EO S-1-07, CARB approved a proposed regulation to implement the Low Carbon Fuel Standard (LCFS) to reduce GHG emissions from the transportation sector in California by approximately 16 MMT CO_2e by 2020. The LCFS is designed

to reduce California's dependence on petroleum, create a lasting market for clean transportation technology, and stimulate the production and use of alternative, low carbon fuels in California. It provides a durable framework that establishes performance standards that fuel producers and importers must meet each year beginning in 2011.

The LCFS includes a protocol for select carbon management projects to become certified and generate LCFS credits. The Carbon Capture and Sequestration Protocol applies to carbon capture and sequestration projects that capture CO_2 and sequester it onshore, in either saline or depleted oil and gas reservoirs, or oil and gas reservoirs used for CO_2-enhanced oil recovery. The Carbon Capture and Sequestration Protocol applies to both new and existing carbon capture and sequestration projects, provided the projects meet the requirements for permanence pursuant to Section C of the protocol. Certified projects must successfully demonstrate adherence to rigorous pre-construction, operational, and site closure standards designed to strengthen environmental performance. The Carbon Capture and Sequestration Protocol is designed to layer on top of existing federal carbon sequestration regulations designed to protect the environment (CARB 2018).

Executive Orders S-3-05 and B-30-15 – Statewide Emission Reduction Targets

EO S-3-05 was established by Governor Arnold Schwarzenegger in June 2005 and sets statewide emission reduction targets through the year 2050:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- by 2050, reduce GHG emissions to 80 percent below 1990 levels.

EO B-30-15 sets a target date of 2030 to reduce GHG emissions to 40 percent below 1990 levels. EOs S-3-05 and B-30-15 are only applicable to "State agencies with jurisdiction over sources of greenhouse gas emissions" (Order 4-29-2015 Section 2), and Kern County is not a State agency. Furthermore, there is currently no implementation strategy for these EOs (that is, a plan that apportions GHG reductions by economic sector/activity/region, similar to CARB's Climate Change Scoping Plan).

Senate Bill 97

SB 97 was enacted requiring the Office of Planning and Research (OPR) to develop guidelines for the mitigation of GHG emissions, or the effects related to releases of GHG emissions. OPR submitted proposed amendments to the Natural Resources Agency in accordance with SB 97 regarding the analysis and mitigation of GHG emissions. As directed by SB 97, the Natural Resources Agency adopted Amendments to the CEQA Guidelines for GHG emissions, which became effective in 2010.

Senate Bill 375

SB 375 establishes mechanisms for the development of regional targets for reducing passenger vehicle GHG emissions. CARB adopted the vehicular GHG emissions reduction targets, in

consultation with the metropolitan planning organizations (MPOs), which require a 7 to 8 percent reduction by 2020 and a 13 to 16 percent reduction by 2035, for each MPO. SB 375 recognizes the importance of achieving significant GHG reductions by working with cities and counties to change land use patterns and improve transportation alternatives. Through the SB 375 process, MPOs, such as the Kern Council of Governments (KCOG), will work with local jurisdictions in the development of sustainable community strategies (SCSs) designed to integrate development patterns and the transportation network in a way that reduces GHG emissions while meeting housing needs and other regional planning objectives. KCOG's current reduction target for per capita vehicular emissions from passenger vehicles and light-duty trucks is 9 percent by 2020 and 15 percent by 2035 compared to 2005 (KCOG 2022).

KCOG most recently adopted the 2022 Regional Transportation Plan (RTP), which includes an SCS component in accordance with SB 375. The 2022 RTP is a 24-year blueprint that establishes a set of regional transportation goals, policies, and actions intended to guide the development of the planned multimodal transportation systems in Kern County. The SCS component strives to reduce polluting tailpipe emissions from passenger vehicle and light-duty truck travel by better coordinating transportation expenditures with forecasted development patterns to help meet CARB GHG targets for the region.

Assembly Bill 32 and Senate Bill 32

In 2006, the California State Legislature adopted AB 32 (codified in the California Health and Safety Code [HSC], Division 25.5 – California Global Warming Solutions Act of 2006), which focuses on reducing GHG emissions in California to 1990 levels by 2020. HSC Division 25.5 defines GHGs as CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6 and represents the first enforceable statewide program to limit emissions of these GHGs from all major industries with penalties for noncompliance. The law further requires that reduction measures be technologically feasible and cost-effective. Under HSC Division 25.5, CARB has the primary responsibility for reducing GHG emissions. CARB is required to adopt rules and regulations directing State actions that would achieve GHG emissions reductions equivalent to 1990 statewide levels by 2020.

While acknowledging that national and international actions will be necessary to fully address the issue of global warming, AB 32 lays out a program to inventory and reduce GHG emissions in California and from power generation facilities located outside the state that serve California residents and businesses. CARB adopted a list of discrete early action measures for implementation to reduce GHG emissions in accordance with its responsibility per AB 32. The 1990 baseline emissions inventory for California was also adopted for the 2020 statewide emissions cap.

Subsequent legislation has included SB 32, which expanded upon AB 32 to reduce GHG emissions to 40 percent below the 1990 levels by 2030; AB 197 which increased CARB's legislative oversight by adding two legislatively appointed non-voting members to the CARB Board and provided additional protection to disadvantaged communities; SB 350, which increased California's renewable energy electricity procurement goal and SB 100, which established a landmark policy requiring renewable energy and zero-carbon resources to supply 100 percent of electrical retail sales to end use customers and 100 percent of electricity procured to serve state agencies by 2045.

Assembly Bill 1279

The California Climate Crisis Act (AB 1279) establishes the policy of the state to achieve carbon neutrality as soon as possible, but no later than 2045; to maintain net negative GHG emissions thereafter; and to ensure that by 2045 statewide anthropogenic GHG emissions are reduced at least 85 percent below 1990 levels. AB 1279 requires CARB to ensure that Scoping Plan updates identify and recommend measures to achieve carbon neutrality, and to identify and implement policies and strategies that enable CO_2 removal solutions and carbon capture, utilization, and storage (CCUS) technologies.

Senate Bill 905

Senate Bill 905 (SB 905, Caballero, Carbon sequestration: Carbon Capture, Removal, Utilization, and Storage Program) signed by the Governor on September 16, 2022, provides for the creation of a Carbon Capture Regulatory Framework. SB 905 requires CARB to establish a "Carbon Capture, Removal, Utilization and Storage Program" to evaluate CCUS and CO_2 removal (CDR) technologies. SB 905 requires CARB to:

- Establish a "Carbon Capture, Removal, Utilization and Storage Program to evaluate the efficacy, safety, and viability of CCUS." CARB will also be required to enhance monitoring procedures for leakage.
- Ensure that CO_2 capture, removal, and sequestration projects include specified components including, among others, certain monitoring activities.
- By January 1, 2025, regulations for a unified permit application, for the construction and operation of CCUS projects (including an expedited review process), must be adopted. All CCUS projects within California will be required to use this application process and CARB will develop a centralized public database to track all in-state projects.
- By January 1, 2025, develop a centralized public database to track the deployment of CCUS and CDR technologies and the development of CO_2 capture, removal, and sequestration projects throughout the state.
- By January 1, 2025, adopt protocols to support additional and new methods for CO_2 utilization and CO_2 storage.
- By January 1, 2025, adopt financial responsibility regulations for CCUS projects that require the CO_2 storage operator to maintain financial responsibility for not less than 100 years after the last date of injection.
- In addition to permitting procedures, CARB must publish a framework for governing agreements regarding two or more tracts of land overlying the same geologic storage reservoir or reservoirs by July 1, 2025. The agreements will set out to manage, develop, and operate CCUS or CDR projects. SB 905 ensures that title to any geologic storage reservoir for CO_2 is vested in the owner of the overlying surface estate (unless it has been severed and separately conveyed).

- CCUS project operators must provide no less than 60 days before commencing the development of CO_2 capture, removal, and storage (sequestration) project, written notice to each owner of a surface or subsurface or subsurface estate adjacent to or within a geologic storage complex or reservoir. Project operators must also prove and maintain financial responsibility for the project. Agreements between operators and relevant parties, that any drilling or extraction be prohibited in the geologic storage reservoir for at least 100 years after the CO_2 is injected, must be made for every project. All project operators also need to create an air monitoring and mitigation plan that is submitted to CARB.
- Require changes in operations of a CO_2 capture, removal, or sequestration project to ensure public and environmental health and safety if the monitoring and reporting detects increased seismicity or CO_2 leakage outside the geologic storage reservoir.

Other requirements in SB 905 include monitoring and reporting requirements for CO_2 storage operators, the establishment of a working group on CO_2 storage, and the restriction of CO_2 injection into a Class II injection well for purposes of enhanced oil recovery.

Senate Bill 1314

Senate Bill 1314 (Limón. Oil and gas: Class II injection wells: enhanced oil recovery) signed by the governor on September 16, 2022, prohibits operators from injecting a concentrated CO_2 fluid produced by a CO_2 capture project or a CO_2 capture and sequestration project into a Class II injection well for purposes of enhanced oil recovery, including the facilitation of enhanced oil recovery from another well.

Assembly Bill No. 1757

Assembly Bill 1757 (Cristina Garcia. California Global Warming Solutions Act of 2006: climate goal: natural and working lands) signed by the governor on September 16, 2022, requires the Natural Resources Agency (NRA), in collaboration with CARB and other specified state entities, to determine on or before January 1, 2024, an ambitious range of targets for natural carbon sequestration and for nature-based climate solutions that reduce greenhouse gas emissions for 2030, 2038, and 2045 to support state goals to achieve carbon neutrality and foster climate adaptation and resilience.

By January 1, 2025, CARB must develop standard methods for state agencies to consistently track GHG emissions and reductions; carbon sequestration; and, where feasible and in consultation with the NRA and the Department of Food and Agriculture, additional benefits from natural and working lands over time. In estimating and tracking GHG emissions and reductions and carbon sequestration from natural working lands, CARB must account for GHG emissions and reductions of CO_2, methane, and nitrous oxide related to natural and working lands and the potential impacts of climate change on the ability to reduce GHG emissions and sequester carbon from natural and working lands.

CARB 2022 Climate Change Scoping Plan

As required by AB 32, CARB developed an initial Climate Change Scoping Plan containing strategies to achieve the 2020 emissions cap in 2008. CARB released updates to the Climate Change Scoping Plan in 2014, 2017, and 2022.

The CARB 2022 Scoping Plan for Achieving Carbon Neutrality (CARB 2022 Scoping Plan) lays out a path to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045, as directed by AB 1279 (CARB 2022b). The CARB 2022 Scoping Plan acknowledges the need to deploy all viable tools to address the existential threat that climate change presents, including carbon capture and sequestration. Modeling completed in support of the CARB 2022 Scoping Plan clearly shows there is no path to carbon neutrality without carbon removal and sequestration, making it an essential tool to achieve carbon neutrality. Governor Newsom also recognized the importance of CO_2 removal strategies and directed CARB to establish CO_2 removal and carbon capture targets of 20 MMT CO_2 and 100 MMT CO_2 by 2030 and 2045, respectively, as well as signing 2022 legislation on carbon removal and sequestration, including AB 1279, SB 905, SB 1137, and AB 1757 (CARB 2022b).

Mandatory Greenhouse Gas Reporting Regulation (17 CCR 95100-95158)

Statewide reporting of GHG emissions by major sources is required by AB 32. The Regulation for the Mandatory Reporting of Greenhouse Gas Emissions is applicable to industrial facilities, fuel suppliers, and electricity importers. The project would not be expected to trigger GHG reporting according to the rule.

Cap-and-Trade Program (17 CCR 95800 to 96022)

On October 20, 2011, CARB approved the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation (Cap-and-Trade Program) as part of the AB 32 implementation measures. The final regulation order was updated in 2018 and became effective as of April 1, 2019.

Cap-and-trade is a market-based regulation that is designed to reduce GHGs from multiple sources. Cap-and-trade sets a firm limit, or cap, on GHG emissions from all sources in the Cap-and-Trade Program which declines approximately 3 percent each year. In the market, a price on carbon is established for GHGs. Trading and market forces create incentives to reduce GHGs below allowable levels through investments in technological innovation in clean technologies. Carbon capture and storage (CCS) projects are not currently eligible to generate credits to sell or trade on the market, however, the stationary sources related to the installation of equipment would be expected to be subject to the program based on GHG emissions generated by that equipment.

Short-Lived Climate Pollutants – Senate Bill 605 and Senate Bill 1383

Short-lived climate pollutants (SLCP) (that is, black carbon, fluorinated gases, and CH_4) are powerful climate forcers that remain in the atmosphere for a much shorter period of time than longer-lived climate pollutants. Their relative potency, when measured in terms of how they heat the atmosphere, can be tens, hundreds, or even thousands of times greater than that of CO_2. The

impacts of SLCP are especially strong over the short term. Reducing these emissions can make an immediate beneficial impact on climate change.

SLCP emissions reductions will support achieving AB 32 and SB 32 GHG emission reduction targets. SB 605 directed CARB, in coordination with other State agencies and local air districts, to develop a comprehensive SLCP reduction strategy, and SB 1383 directed CARB to approve and begin implementing this strategy. This legislation also set statewide emissions reduction targets specifying a 40 percent reduction in CH_4, a 40 percent reduction in HFCs, and a 50 percent reduction in anthropogenic black carbon below 2013 levels by 2030. The bill also established specific targets for reducing organic waste in landfills and provided specific direction for CH_4 emissions reductions from dairy and livestock operations.

The SLCP Reduction Strategy, approved by the Board in March 2017, lays out a range of options to reduce SLCP emissions in California, including regulations, incentives, and other market-supporting activities. The SLCP Strategy also informed the CARB 2022 Scoping Plan.

Other Mobile Source Reduction Requirements

Several other State provisions address the GHG emissions reduction targets set by CARB for mobile sources, including trucks, passenger vehicles, trains, and ships. These measures include:

- Low Carbon Fuel Standard (EO S-01-07)
- Advanced Clean Cars Program
- SmartWay Truck Efficiency Regulation
- AB 32 Cap-and-Trade Program as applicable to transportation fuel suppliers (beginning January 1, 2015)
- SB 375 (Land Use Planning) including the development of a Sustainable Communities Strategy as part of a Metropolitan Planning Organization's Regional Transportation Plan.

In particular, SB 375 requires the Air Resources Board to set regional targets for GHG emission reductions from passenger vehicles and light-duty trucks and requires each regional MPO to adopt an SCS into its regional transportation plan that would allow the region to meet its GHG emission reduction target. The KCOG adopted the SCS for Kern County as part of its RTP in 2014. The RTP and SCS incorporate forecasted development patterns, modeling, and measures designed to integrate land use and transportation planning to reduce local and regional GHG emissions. Oil and gas resources, as well as other land uses, are components of the SCS. While SB 375 does not require local governments to amend their general plans to implement the SCS, it provides incentives for them to do so. Implementation of SB 375 is expected to substantially reduce GHG emissions in the County and throughout the state.

Local

San Joaquin Valley Air Pollution Control District

The project area is located within Kern County's portion of the SJVAB. Kern County is included among the eight counties that comprise the SJVAPCD. The SJVAPCD acts as the regulatory agency for air pollution control in the SJVAB and is the local agency empowered to regulate emissions for the project area. The SJVAPCD is a CEQA Trustee Agency for the project.

In August 2008, the SJVAPCD adopted its Climate Change Action Plan (CCAP). The CCAP directed the SJVAPCD to develop guidance to assist CEQA lead agencies, project proponents, permit applicants, and interested parties in assessing and reducing the impacts of project GHG emissions on global climate change (SJVAPCD 2008).

On December 17, 2009, the SJVAPCD adopted Guidance for Valley Land Use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA (SJVAPCD 2009), which outlined the SJVAPCD's methodology for assessing a project's significance for GHGs under CEQA. The following criteria were outlined in the document to determine whether a project could have a significant impact:

- Projects determined to be exempt from the requirements of CEQA would be determined to have a less than significant individual and cumulative impact on GHG emissions and would not require further environmental review, including analysis of project specific GHG emissions. Projects exempt under CEQA would be evaluated consistent with established rules and regulations governing project approval and would not be required to implement Best Performance Standards (BPS).
- Projects complying with an approved GHG emission reduction plan or GHG mitigation program that avoids or substantially reduces GHG emissions within the geographic area in which the project is located would be determined to have a less than significant individual and cumulative impact for GHG emissions. Such plans or programs must be specified in law or approved by the lead agency with jurisdiction over the affected resource and supported by a CEQA-compliant environmental review document adopted by the lead agency. Projects complying with an approved GHG emission reduction plan or GHG mitigation program would not be required to implement BPS.
- Projects implementing BPS would not require quantification of project-specific GHG emissions. Consistent with CEQA Guidelines, such projects would be determined to have a less than significant individual and cumulative impact on GHG emissions.
- Projects not implementing BPS would require quantification of project-specific GHG emissions and demonstration that project-specific GHG emissions would be reduced or mitigated by at least 29 percent, compared to business as usual (BAU), including GHG emission reductions achieved since the 2002–2004 baseline period. Projects achieving at least a 29 percent GHG emission reduction compared to BAU would be determined to have a less than significant individual and cumulative impact for GHG.

- Notwithstanding any of the above provisions, projects requiring preparation of an EIR for any other reason would require quantification of project-specific GHG emissions. Projects implementing BPS or achieving at least a 29 percent GHG emission reduction compared to BAU would be determined to have a less than significant individual and cumulative impact on GHG.

The SJVAPCD determined BAU and baseline emissions have been established based on the years 2002–2004 and 2020, respectively. The 2020 projected baseline has passed, and at this time, no new guidance has been approved for determining BAU and projected baseline for the next target year. Therefore, the 29 percent reduction from BAU cannot be applied to the project to determine significance. Additionally, a BPS threshold has not been established.

Kern County General Plan

The project area is located within the Kern County General Plan (KCGP) area and, therefore, would be subject to applicable policies and measures of the KCGP. The Land Use, Conservation, and Open Space Element of the KCGP includes goals, policies, and implementation measures applicable to the project that would indirectly impact GHG emissions through the reduction of fossil fuel use, as described below.

Chapter 1. Land Use, Conservation, and Open Space Element

1.10. General Provisions

1.10.2. Air Quality

Policies

Policy 19. In considering discretionary projects for which an Environmental Impact Report must be prepared pursuant to the California Environmental Quality Act, the appropriate decision-making body, as part of its deliberations, will ensure that:

a. All feasible mitigation to reduce significant adverse air quality impacts have been adopted; and

b. The benefits of the proposed Project outweigh any unavoidable significant adverse effects on air quality found to exist after inclusion of all feasible mitigation. This finding shall be made in a statement of overriding considerations and shall be supported by factual evidence to the extent that such a statement is required pursuant to the California Environmental Quality Act.

Policy 22. Kern County shall continue to work with the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District toward air quality attainment with federal, state, and local standards.

Policy 23. The County shall continue to implement the local government control measures in coordination with the Kern Council of Governments and the San Joaquin Valley Unified Air Pollution Control District.

Implementation Measures

Implementation Measure F. All discretionary permits shall be referred to the appropriate air district for review and comment.

Implementation Measure G. Discretionary development projects involving the use of tractor trailer rigs shall incorporate diesel exhaust reduction strategies including, but not limited to:

a. Minimizing idling time.

b. Electrical overnight plug-ins.

Implementation Measure H. Discretionary projects may use one or more of the following to reduce air quality effects:

a. Pave dirt roads within the development.

b. Pave outside storage areas.

c. Provide additional low Volatile Organic Compounds (VOC) producing trees on landscape plans.

d. Use of alternative fuel fleet vehicles or hybrid vehicles.

e. Use of emission control devices on diesel equipment.

f. Develop residential neighborhoods without fireplaces or with the use of Environmental Protection Agency certified, low emission natural gas fireplaces.

g. Provide bicycle lockers and shower facilities on site.

h. Increasing the amount of landscaping beyond what is required in the Zoning Ordinance (Chapter 19.86).

i. The use and development of park and ride facilities in outlying areas.

j. Other strategies that may be recommended by the local Air Pollution Control Districts.

4.8.4 Impacts and Mitigation Measures

This section describes the methodology used in conducting the CEQA impact analysis for GHG emissions; the thresholds of significance used in assessing impacts on GHG emissions; and the assessment of impacts on GHG emissions and global climate change, including relevant mitigation measures.

Methodology

The analysis presented within this section is based on both qualitative and quantitative approaches for determining GHG impacts associated with the construction and operation of the project. The

findings in the Air Quality Impact Analysis prepared for the project (provided in Appendix B of this EIR), were used to assess the project's impacts related to GHG emissions.

GHG emissions associated with the construction of the project were estimated using the California Emissions Estimator Model (CalEEMod). The CalEEMod equipment list was updated to reflect the list of proposed construction equipment that was provided by the project proponent. Applying model defaults as well as a conservative analysis approach, construction emissions were estimated according to the supplied construction schedule starting in 2025. The dates entered into the CalEEMod program may not represent the actual dates the equipment will operate; however, the total construction time is accurate and, therefore, all estimated emission totals are conservative and reflect a reasonable and legally sufficient estimate of potential impacts. All construction equipment activity assumption levels were based on the specified CalEEMod default values for equipment horsepower, load factors, and hours per day. CalEEMod inputs and resulting outputs can be found in the Air Quality Impact Analysis in Appendix B-1.

CO_2 capture facility and infrastructure construction would occur over a period of approximately three years, starting with pre-combustion (Pre-C) facility construction at Gas Plant 32 (GP 32). Sequential construction would occur for the construction of the post-combustion (Post-C) facilities located at Co-Generation Plant 32 (COGEN 32) and the two steam generator settings (SGSs). Injection well pad construction, drilling and plugging and abandonment activities, and pipeline construction activities would begin concurrently with the start of facility construction. Installation of CO_2 distribution pipelines, intra-field electrical distribution, and well hookups would occur throughout the three-year period.

SJVAPCD's required construction site measures for all projects were also applied:

- Water exposed areas three times per day
- Reduce vehicle speed to less than 15 miles per hour

Operational sources of GHG associated with the project include mobile, area, and energy sources. Operational mobile sources include vehicle exhaust from new worker trips to and from the project site. Exhaust emissions would vary substantially from day to day but would average out over the course of an operational year. The traffic study prepared for the project analyzed the potential for vehicular traffic from the operations and maintenance of the compression and pumping facility (see Appendix I) (Stantec 2023). The traffic study estimated an average of 25 new daily trips from worker vehicles. Mobile emissions were estimated using EMFAC2021 v.1.0.2 modeling software for the operational year of 2026 (see the Air Quality Impact Analysis in Appendix B-1).

Proposed CO_2 capture facilities include the separation, dehydration, compression, and cooling of CO_2 from both Pre-C produced gas stream and from Post-C flue gas. The project would have stationary source GHG emissions from increased fuel usage associated with the Del Sur Compressors, COGEN 32 natural gas turbines, and new utility steam generators at the Pre-C and Post-C facilities. SJVAPCD Permit to Operate emission factors were used to calculate anticipated increases from stationary sources.

In order to assess impacts of the project, baseline emissions from the existing mobile and stationary sources were calculated. Baseline mobile emissions were calculated as described above based on an average of 50 existing daily trips from worker vehicles. Baseline stationary source emissions were taken from the 2022 Annual Emissions Inventory for the COGEN 32, SGS 2868, and SGS 2972 facilities and average emissions from the 2009-2016 Annual Emissions Inventories were used to represent the baseline for GP 32 (see the Air Quality Impact Analysis in Appendix B-1).

Additionally, the project, as proposed, has the capacity for up to 40 MMT of estimated storage and is capable of storing up to 1.6 MMT of CO_2 per year within the 64 Zone reservoir pursuant to its Class VI Underground Injection Control (UIC) application (included in Appendix E-2). The installed capture facilities will have a capture efficiency of 95 percent at the Pre-C facility and 90 percent at the Post-C facilities. The source of CO_2 for injection as part of this project would be the Pre-C produced gas streams and Post-C flue gas from within the Belridge oilfields; no additional sources of captured CO_2 or new source development are proposed with this EIR. The project, however, will be approved for the total permanent storage of CO_2 by this Conditional Use Permit (CUP) with a permit from the EPA UIC for operation for up to 3.3 MMT CO_2e per year.

All future sources are required to be permitted with a separate CUP process and environmental review for compliance with CEQA.

GHG emissions from the implementation of the project were calculated for both construction and operational sources (mobile and stationary) and GHG reductions from the implementation of the project were also quantified and considered when determining impacts.

As stated previously, climate change is a cumulative and global issue causing global impacts. Thus, the study area for climate change and the impact analysis of GHG emissions is broad because climate change is influenced by global emissions and their associated effects. Those effects of climate change can also have localized impacts on resources and ecosystems in California. Despite the fact that climate change is a global issue, CEQA only requires that an EIR address indirect impacts that are not speculative.

Section 4.8.3, *Regulatory Setting*, shows the applicable laws and regulations that ensure management and ongoing reductions of GHG at state, regional, and local levels. All project activities must comply with applicable federal, state, and local laws and regulations and will be subject to review by the SJVAPCD.

Note that analytical tools have not been developed that can determine the effect on worldwide global warming from a particular project-specific increase in GHG emissions, or the effect of global GHG emissions on the climate at a particular location.

Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist, following the "Environmental Checklist Form," Appendix G to the Statewide CEQA Guidelines as

amended by the California Natural Resources Agency and effective on December 28, 2018, state that a project would have significant impacts on GHG emissions if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with any applicable plan, policy, or regulation adopted to reduce the emissions of GHGs.

Pursuant to the CEQA Appendix G thresholds, impacts were evaluated based on whether the project would be consistent with the State's applicable GHG reduction goals, plans, policies, and regulatory requirements. Specifically, those plans and policies established in CARB's 2022 Climate Change Scoping Plan as well as other federal, state, and local policies.

Where an approved GHG emission reduction program is not in place, guidance documents next rely on the use of performance-based standards, otherwise known as BPSs, as a basis for assessing the significance of project GHG emissions on global climate change under CEQA. BPSs consist of established specifications or project design elements that are used as a method of determining the significance of project-specific GHG emission impacts. BPSs are defined as the most effective achieved in practice means of reducing or limiting GHG emissions from a GHG emissions source. BPS for stationary source projects include equipment type, equipment design, and operational and maintenance practices for the identified service, operation, or emissions unit class or category (SJVAPCD 2009).

Table 4.8-2 describes the SJVAPCD BPS applicable to the project.

Table 4.8-2: SJVAPCD Best Performance Standards Applicable to the Project

Class	Category	Best Performance Standard	Percentage Achieved GHG Emission Reduction Relative to Baseline Emissions	
Components at Light Crude Oil and Natural Gas Production, Natural Gas Processing Facilities, Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants (Approved 07/01/2010)	Components Subject to Rules 4409 and 4555 Requirements	Minimize GHG emissions by applying leak standards and I&M requirements to components subject to Rules 4409 and 4455 requirements	Light Crude Oil and Natural Gas Production	60%
			Natural Gas Processing	82%
			Refineries	86%
			Gas Liquid Processing	89%
	Components Not Subject to Rules 4409 and 4555 Requirements	Minimize fugitive GHG emissions by applying leak standards and I&M requirements to components not subject to Rules 4409 and 4455 requirements	Components not subject to Rules 4409 and 4455 Requirements	91%
Thermally Enhanced Oil Recovery (Approved 07/01/2010)	Components Subject to Rule 4401	Minimize fugitive GHG emissions by applying leak standards and I&M to components subject to Rule 4401	28%	
	Components Not Subject to Rule 4401	Minimize fugitive GHG emissions by applying leak standards and I&M to components not subject to Rule 4401	48%	
Steam Generators (Approved 06/24/2010)	Oilfield	Very high-efficiency generator design with: 1. A convection section with at least 235 square feet of heat transfer surface area per MMBtu/h of maximum rated heat input (verified by manufacturer) or a manufacturer's overall thermal efficiency rating of 88%. and 2. Variable frequency drive high-efficiency electrical motors driving the blower and water pump.	13%	

Sources: SJVAPCD 2010a, 2010b, 2010c, 2011
Key:
GHG = greenhouse gases
I&M = inspection and maintenance
MMBtu/h = million British thermal units per hour

The District recommends use of BPS for assessing climate change impacts to streamline the process of determining significance under CEQA. BPS are not intended as a required emission reduction measure. Under SJVAPCD guidance, projects implementing BPS would be determined to have a less than cumulatively significant impact on global climate change. Projects that do not comply

with an approved GHG emission reduction plan or use BPS must demonstrate a 29 percent reduction in GHG emissions from BAU to be determined to have a less than cumulatively significant impact on global climate change. BAU is determined by multiplying 2002–2004 emission factors by the activity expected to occur in 2020. The guidance does not limit a lead agency's authority to establish its own process and guidance for determining the significance of project-related impacts on global climate change (SJVAPCD 2009).

Project Impacts

As discussed previously, climate change impacts are inherently global and cumulative, and not project specific. The SJVAPCD's March 2015 Guidance for Assessing and Mitigating Air Quality Impacts observes that:

"It is widely recognized that no single project could generate sufficient GHG emissions to noticeably change global climate temperature. However, the combination of GHG emissions from past, present and future projects could contribute substantially to global climate change. Thus, project-specific GHG emissions should be evaluated in terms of whether or not they would result in a cumulatively significant impact on global climate change" (SJVAPCD 2015, Section 8.9.).

Impact 4.8-1: Generate Greenhouse Gas Emissions, Either Directly or Indirectly, that may have a Significant Impact on the Environment

The project would generate GHG emissions during construction and operational activities. Three GHGs associated with the project, CO_2, CH_4, and N_2O, would be emitted from on-road vehicles and non-road equipment during construction. The estimated GHG emissions from construction activities associated with the project are shown in Table 4.8-3.

Table 4.8-3: Estimated Construction GHG Emissions

Emission Source	GHG Emissions (MT CO_2e)
Year 2025	
On-Site Roads	67
Facilities Pad Grading - GP32	136
Facilities Pad Grading - 32 Cogen	136
Facilities Pad Grading - SGS2868	136
GP32 - CO_2 Capture Facility	1,478
32 Cogen - CO_2 Capture Facility	2,460
SGS2868 - CO_2 Capture Facility	839
Compressor Station Construction	326
CO_2 Main Pipeline	1,480
Distribution Pipelines	928
Elec Transmission Lines	239

Table 4.8-3: Estimated Construction GHG Emissions

Emission Source	GHG Emissions (MT CO_2e)
On-site Electrical Substations	239
Water Pipelines	240
Tulare CVR Gas Pipeline	165
Steam Pipelines	243
Demolition	163
Year 2026	
Facilities Pad Grading - SGS2972	136
GP32 - CO_2 Capture Facility	2,908
32 Cogen - CO_2 Capture Facility	2,908
SGS2868 - CO_2 Capture Facility	2,908
SGS2972 - CO_2 Capture Facility	2,351
CO_2 Main Pipeline	733
Intra-Field Electrical Distribution	239
Year 2027	
GP32 - CO_2 Capture Facility	1,208
32 Cogen - CO_2 Capture Facility	231
SGS2868 - CO_2 Capture Facility	1,844
SGS2972 - CO_2 Capture Facility	2,901
Year 2028	
SGS2972 - CO_2 Capture Facility	333
Total Construction Emissions	**27,975**

Source: Trinity Consultants 2023
Notes:
Refer to Appendix B-1 for all assumptions and calculations.
Totals may be slightly off due to rounding.
Key:
GHG = greenhouse gases
MT CO_2e = metric tons of carbon dioxide equivalent

CO_2, CH_4, and N_2O would also be emitted from mobile and stationary sources associated with project operation. GHG reductions from implementation of the project, which consists of capture and injection of Aera Energy-sourced CO_2, were also quantified and considered when determining impacts. The estimated GHG emissions from operational activities associated with the project are shown in Table 4.8-4.

Table 4.8-4: Estimated Operational GHG Emissions

Year	Total Emissions from Existing Plants (MT CO_2e)[a]	Capture Facilities Mobile and Indirect Electricity Emissions (MT CO_2e)	Captured and Injected Emissions (MT CO_2e) Total	Net Emissions (MT CO_2e)
Baseline	1,119,176	-	-	1,119,176
Capture Year 1 (2027)	1,405,442	30,000	300,000	1,135,442
Capture Year 2 (2028)	1,773,437	40,000	400,000	1,413,437
Capture Year 3 (2029)	1,773,437	160,000	1,600,000	333,437
Capture Year 4 (2030)	1,773,437	160,000	1,600,000	333,437
Capture Year 5 (2031)	1,773,437	160,000	1,600,000	333,437
Capture Year 6 (2032)	1,773,437	185,000	1,850,000	108,437
Capture Year 7 (2033)	1,773,437	185,000	1,850,000	108,437
Capture Year 8 (2034)	1,773,437	210,000	2,100,000	-116,563
Capture Year 9 (2035)	1,773,437	210,000	2,100,000	-116,563
Capture Year 10 (2036)	1,773,437	210,000	2,100,000	-116,563
Capture Year 11 (2037)	1,773,437	210,000	2,100,000	-116,563
Capture Year 12 (2038)	1,773,437	230,000	2,300,000	-296,563
Capture Year 13 (2039)	1,773,437	230,000	2,300,000	-296,563
Capture Year 14 (2040)	1,773,437	230,000	2,300,000	-296,563
Capture Year 15 (2041)	1,773,437	230,000	2,300,000	-296,563
Capture Year 16 (2042)	1,773,437	330,000	3,300,000	-1,196,563
Capture Year 17 (2043)	1,773,437	330,000	3,300,000	-1,196,563
Capture Year 18 (2044)	1,773,437	330,000	3,300,000	-1,196,563
Capture Year 19 (2045)	1,773,437	330,000	3,300,000	-1,196,563
Total Years 1-19 (2027-2045)	**33,327,307**	**4,000,000**	**40,000,000**	**-2,672,692**

Source: Trinity Consultants 2024
Refer to Appendix B-1 for all assumptions and calculations.
Notes: Totals may be slightly off due to rounding.
[a] Operational emissions from the existing pre-combustion (De Sur and GP32) and post-combustion (COGEN32, SGS2972 & SGS2868) facilities are presented in order to give a clear picture of what the project site will look like before and after project implementation.
Key:
GHG = greenhouse gases
MT CO_2e = metric tons of carbon dioxide equivalent

As shown in Table 4.8-3, the project's total construction GHG emissions would be 27,975 MT CO_2e. Table 4.8-4 shows the project's operational GHG emissions of 30,000 MT CO_2e per year in

Capture Year 1, increasing through Capture Year 19, with 4,000,000 MT CO_2e over the 19-year operational lifetime of the project. That amount will increase each year, beyond the 19 years, that injection activities occur. The life of the project is dependent on the sources permitted for injection into the storage, the ability of the project year by year to obtain CO_2 and inject at the maximum of 1.6 MMT per year, and the maximum amount of storage permitted up to 40 MMT of CO_2 stored. The maximum storage quantity is regulated by the EPA Class IV UIC injection well permit and is determined by the EPA based on the quality of the pore space, and the size of the area of review. The determinations for the permit are to protect drinking water and in conjunction with an approved CUP are binding on the project. Table 4.8-4 shows only the initial source permitted with this EIR (Pre-C produced gas streams and Post-C flue gas from within the Belridge oilfields) at the same rate. This is a projection, as the State of California policies that will ban fossil fuel production by 2045 may occur sooner and the gas plant may be forced to close sooner due to such policies. Total GHG reductions of 40,000,000 MT CO_2e over 19 years are projected from the implementation of the project, resulting in a net reduction in emissions from the existing sources associated with Belridge oilfield gas operations baseline of 33,327,307 MT CO_2e.

The proposed CCS component of the project, if approved, would permit a maximum of 3.3 MMT per year injected and total underground pore space storage of 40 MMT within the 64 Zone reservoir. The amount that can be injected into the reservoir is set by the EPA UIC Class VI injection permits and conditioned for the limits by the Conditional Use Permit and this CEQA analysis. The permitting process analyzed in this EIR is the total storage capacity site of 40 MMT within the 12,362 acres of the CUP boundary with a maximum injection of a total of 3.3 MMT per year. Additional sources will need to be identified and permitted by the applicant and those sources must be legally permitted and disclosed as required by Mitigation Measure (MM) 4.9-11 (Section 4.9, *Hazards and Hazardous Materials*). and limited geographically by MM 4.11-7 in Section 4.11 Land Use and Planning. Each potential source will have capture facilities with the same amine technology or better and a reasonable assumption can be made that it would produce the same GHG emissions per ton of capture as evaluated for this initial source. Table 4.8-5 shows the estimated schedule of injection based on projections by the applicant, who is responsible for obtaining sources of CO_2 for injection into the project. All known sources in both this project EIR and the CTV 1 Draft REIR are shown in Section 3.9 of Chapter 3, *Project Description*, but as they have not been permitted or completed CEQA, information cannot be provided on the total amount of GHG emissions they produce, how much will be captured, how much stored, how much additional created or how much will still be released to the atmosphere. Table 4.8-5 projects future operations through 2045, which is the life span capacity of the 64 Zone reservoir and the goal date of California's EO B-55-18 mandate to achieve carbon neutrality by 2045. It includes the injection of captured CO_2 from unknown sources and the estimated GHG emissions based on that amount from the actual capture process from those sources.

Table 4.8-5: Projected Injection 2027–2045

Year	Phase 1 GHG Injected (MT CO_2e)	Phase 2 GHG Injected (MT CO_2e)	Total GHG Injected (MT CO_2e)	GHG from Capture Facility (MT CO_2e)
Capture Year 1 (2027)	300,000	-	300,000	30,000
Capture Year 2 (2028)	400,000	-	400,000	40,000
Capture Year 3 (2029)	1,600,000	-	1,600,000	160,000
Capture Year 4 (2030)	1,600,000	-	1,600,000	160,000
Capture Year 5 (2031)	1,600,000	-	1,600,000	160,000
Capture Year 6 (2032)	1,600,000	250,000	1,850,000	185,000
Capture Year 7 (2033)	1,600,000	250,000	1,850,000	185,000
Capture Year 8 (2034)	1,600,000	500,000	2,100,000	210,000
Capture Year 9 (2035)	1,600,000	500,000	2,100,000	210,000
Capture Year 10 (2036)	1,600,000	500,000	2,100,000	210,000
Capture Year 11 (2037)	1,600,000	500,000	2,100,000	210,000
Capture Year 12 (2038)	1,600,000	700,000	2,300,000	230,000
Capture Year 13 (2039)	1,600,000	700,000	2,300,000	230,000
Capture Year 14 (2040)	1,600,000	700,000	2,300,000	230,000
Capture Year 15 (2041)	1,600,000	700,000	2,300,000	230,000
Capture Year 16 (2042)	1,600,000	1,700,000	3,300,000	330,000
Capture Year 17 (2043)	1,600,000	1,700,000	3,300,000	330,000
Capture Year 18 (2044)	1,600,000	1,700,000	3,300,000	330,000
Capture Year 19 (2045)	1,600,000	1,700,000	3,300,000	330,000
Total Years 1-19 (2027-2045)	**27,900,000**	**12,100,000**	**40,000,000**	**4,000,000**

Source: Aera Energy LLC 2024
Key:
GHG = greenhouse gases
MT CO_2e = metric tons of carbon dioxide equivalent

While 40,000,000 MT of CO_2 will be captured from either an operating facility, such as a hydrogen plant for transportation fuels, or from a direct air capture technology that captures atmospheric CO_2, the capture technology itself creates CO_2 during operation. Table 4.8-5 estimates, based on the use of existing amine technology, 4,000,000 MT of additional CO_2 will be created. MM 4.8-6 requires that both the CO_2 created by the initial project capture process as well as any outside sources that will send CO_2 for injection must be mitigated to a level of "no net increase." While the projections are based on amine technology, newer forms of capture may not produce that level of CO_2 emissions and, therefore, the projections are a conservative estimate based on the volume of injection.

The capture of the GHG from the initial source and other sources will reduce the amount of CO_2 in the atmosphere emitted by industries that are essential but hard to decarbonize, such as concrete and hydrogen transportation fuels. In the larger global accounting of GHG the amount is not enough to address overall regional climate change but does support California's EO B-55-18 mandate to achieve carbon neutrality by 2045. Accounting for the GHG emissions reductions from CCS, the project's impacts related to GHG emissions would be less than significant. However, the estimated reductions are contingent upon injected CO_2 remaining in the identified geographically confined reservoir for storage in perpetuity without leakage from injection and capture activities. Should any of the injected CO_2 leak at injection or additional, unmitigated GHG emissions be created from the capture facility operations, then GHG emissions from the project would be potentially significant. Implementation of MM 4.8-1 through MM 4.8-6 would greatly reduce the likelihood of CO_2 escaping from the reservoir, but the possibility of a release due to unforeseen circumstances or equipment failure remains. Given the background concentrations on a statewide level, the contribution to greenhouse emissions due to unknown release of emissions or stops to injection for monitoring failures remains significant and unavoidable.

Mitigation Measures

MM 4.8-1 Prior to any injection of CO_2 the owner/operator shall submit a monitoring plan that complies with all requirements of the U.S. Environmental Protection Agency (EPA) Underground Injection Control permit issued for the project to demonstrate the retention of CO_2 in the injection/hydrocarbon reservoir zone. The plan shall be submitted to the Kern County Planning and Natural Resources Department concurrent with submittal to the EPA for review. A copy of the final approved plan from the EPA shall be provided to the Kern County Planning and Natural Resources Department.

MM 4.8-2 The owner/operator shall submit to the Kern County Planning and Natural Resources Department a quarterly report on the amount of CO_2 injected into the carbon capture and storage (CCS) project, and the source of the CO_2. The reports shall be filed no later than the following dates of each year:

a. First quarter – March 31

b. Second Quarter – June 30

c. Third Quarter – September 30

d. Fourth Quarter – December 18 (early deadline)

MM 4.8-3 All new permitted stationary sources associated with the CCS project shall comply with the Cap-and-Trade regulation (e.g., by reducing greenhouse gas emissions within their facilities or by surrendering greenhouse gas allowances, offset credits, or other compliance instruments to offset the greenhouse gas increases), and implement Best Performance Standards applicable to greenhouse gas reduction for Components at Light Crude Oil and Natural Gas Production, Natural Gas Processing Facilities.

MM 4.8-4 The CCS project shall implement methods to recover for reuse or destroy methane existing in associated gas and casinghead gas, as follows: a. Recover all associated gas produced from the reservoir via new wells, regardless of the well type, except for gas produced from wildcat and delineation wells or as a result of start-up, shutdown and maintenance activities (whether planned or unplanned), system failures, and emergencies in accordance with San Joaquin Valley Air Pollution Control District (SJVAPCD) regulations (Rule 4401 and 4409), as this may be amended over time.

MM 4.8-5 The CCS project shall implement any regulations adopted or amended for methane.

MM 4.8-6 The project shall offset all greenhouse gas emissions associated with the capture facility, and construction equipment not covered by the Cap and-Trade program or other mandatory greenhouse gas emission reduction measures through owner/operator reductions of greenhouse gas emissions as verified by the SJVAPCD, through acquisition of offset credits from the California Air Pollution Control Officers Association Exchange Register or other third party greenhouse gas reductions as verified by the SJVAPCD, or through inclusion in an Emission Reduction Agreement, to offset project-related greenhouse gas emissions that are not included in the Cap-and-Trade program to assure that no net increase in greenhouse gas emissions from the project construction or operation occur. All sources providing CO_2 for injection must certify that any additional CO_2 generated from the source capture facility has been mitigated to "no net increase" before injection at the CarbonFrontier CCS Project by Aera Energy, LLC.

Level of Significance After Mitigation

Impacts would be significant and unavoidable.

Impact 4.8-2: Conflict with any Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing the Emissions of Greenhouse Gas

The project regulatory setting (Section 4.8.3, *Regulatory Setting*) describes the applicable plans, policies, and regulations adopted at federal, state, and local levels to reduce GHG emissions in Kern County. As discussed above, impacts were evaluated based on whether the project would be consistent with the State's applicable GHG reduction goals, plans, policies, and regulatory requirements as well as other federal, state, and local policies, as provided in the following analyses.

CARB 2022 Scoping Plan

The CARB 2022 Scoping Plan lays out a path to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045. It acknowledges the need to deploy all viable tools to address the existential threat that climate change presents, including CCS. Modeling completed in support of the CARB 2022 Scoping Plan clearly shows there is no path to carbon neutrality without carbon removal and sequestration, making it an essential tool to achieve carbon neutrality. Governor Newsom also recognized the importance of CO_2 removal strategies and directed CARB to establish CO_2 removal and carbon capture targets of 20 MMT CO_2 and 100 MMT CO_2 by 2030 and 2045, respectively, as well as signing 2022 legislation on carbon removal and sequestration, including AB 1279, SB 905, SB 1137, and AB 1757 (CARB 2022b).

CCS is identified as one of the strategies for carbon removal and sequestration in the CARB 2022 Scoping Plan. Although no CCS projects are currently operational in California, CCS is not a new concept or technology. As described in the CARB 2022 Scoping Plan, 20 years of CCS testing show that CCS is a safe and reliable tool, and many CCS projects have been implemented elsewhere in the United States and worldwide since the 1970s.

The CARB 2022 Scoping Plan defines carbon management as the capture, movement, and sequestration of CO_2 through mechanical solutions for both capture at point sources and direct removal from the atmosphere through direct air capture. CARB states that enabling policies and regulations across each of these steps is necessary for individual projects, and on a broader scale, for delivering reductions in support of the state's carbon neutrality and long-term carbon-negative goals. The following strategies for success are identified in the CARB 2022 Scoping Plan for the Carbon Dioxide Removal and Capture Sector:

- Implement SB 905.
- Convene a multi-agency Carbon Capture and Sequestration Group composed of federal, state, and local agencies to engage with environmental justice advocates, tribes, academics, researchers, and community representatives to identify the current status, concerns, and outstanding questions concerning carbon capture and sequestration, and develop a process to engage with communities to understand specific concerns and consider guardrails to ensure safe and effective deployment of carbon capture and sequestration.
- Iteratively update the CARB Carbon Capture and Sequestration Protocol with the best available science and implementation experience.

- Incorporate carbon capture and sequestration into other sectors and programs beyond transportation where cost-effective and technologically feasible options are not currently available and to achieve the 85 percent reduction in anthropogenic sources below 1990 levels as called for in AB 1279.
- Evaluate and propose, as appropriate, financing mechanisms and incentives to address market barriers for carbon capture and sequestration and CDR.
- Evaluate and propose, as appropriate, the role of carbon capture and sequestration in cement decarbonization (SB 596) and as part of hydrogen production pathways (SB 1075).
- Support carbon management infrastructure projects through core California Energy Commission research, development, and demonstration programs.
- Continue to explore carbon capture applications for producing or leveraging zero-carbon power for reliability needs as part of SB 100.
- Consider carbon capture infrastructure when developing hydrogen roadmaps and strategies, especially for non-electrolysis hydrogen production.
- Evaluate and streamline permitting barriers to project implementation while protecting public health and the environment.
- Explore options for how local air quality benefits can be achieved when CCS is deployed.
- Explore opportunities for CCS and CDR developers to leverage existing infrastructure, including subsurface infrastructure.
- Explore permitting options to allow for scaling the number of sources at carbon sequestration hubs.

As a CCS project, the project is essential to meeting California's targets for carbon neutrality, GHG emissions reduction, and CO_2 removal and carbon capture. The project would support the Strategies for Success identified in the CARB 2022 Scoping Plan, which focuses on expanding CO_2 removal and carbon capture and would comply with any new regulations developed as a result of the implementation of the identified strategies. Furthermore, as discussed previously, the project is reasonably expected to reduce region-wide and Statewide GHG emissions over the expected life of the project. Therefore, the project would be consistent with the CARB 2022 Scoping Plan.

KCOG's 2022 RTP

KCOG's 2022 RTP incorporates local land use projections and circulation networks in city and county general plans. The SCS component strives to reduce polluting tailpipe emissions from passenger vehicle and light-duty truck travel by better coordinating transportation expenditures with forecasted development patterns to help meet CARB GHG targets for the region. The 2022 RTP is not directly applicable to the project because the purpose is to provide direction and guidance by making the best transportation and land use choices for future development. Nevertheless, the project would not conflict with the goals and policies of the 2022 RTP. In addition, the project would not impact local transportation or land use during operation.

Other Federal/State/Local Policies

Vehicle and Fuel Standards: CARB has set a number of vehicle and fuel emissions standards to reduce GHG emissions. Vehicles that access the project site would comply with CARB vehicle and fuel standards in effect at the time.

Kern County General Plan: Air quality mitigation measures would ensure that the project is consistent with the KCGP Air Quality Element Policies, Goals, and Implementation Measures that will indirectly reduce GHG emissions by reducing fossil fuel combustion.

Overall, the project would support California's EO B-55-18 mandate to achieve carbon neutrality by 2045 and net negative emissions thereafter, align with the CARB 2022 Scoping Plan strategies for increasing CO_2 removal and carbon capture, and comply with applicable federal, State, and local policies. Furthermore, the project is reasonably expected to reduce region-wide and statewide GHG emissions over the expected life of the project and, therefore, would not conflict with State goals to reduce GHG emissions.

Accounting for permanent CCS and the resulting GHG emissions reductions, the project's impacts related to consistency with applicable GHG reduction plans, policies, and regulations would be less than significant. However, this is contingent upon injected CO_2 remaining in the identified geographically confined reservoir for storage in perpetuity. Should the injected CO_2 fail to remain in the reservoir in perpetuity, GHG emissions from the project would be potentially significant and the project would have the potential to conflict with GHG reduction plans. Implementation of MM 4.8-1 and MM 4.8-2 would greatly reduce the likelihood of CO_2 escaping from the reservoir, but the possibility of a release due to unforeseen circumstances or equipment failure remains. Therefore, Impact 4.8-2 would remain significant and unavoidable.

Mitigation Measures

Implement MM 4.8-1 and MM 4.8-2, as described above.

Level of Significance after Mitigation

Impacts would be significant and unavoidable.

4.8.5 Cumulative Setting, Impacts, and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present, and reasonably foreseeable future oil and gas development including wells and abandonment activity to implement CCS projects constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local*

Permitting, certified on November 9, 2015; supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities, and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells per year countywide of various types (for example, production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 of other wells (cyclic wells, SB 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for eight years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. California Geologic Energy Management permitting for all wells except plugging and abandonments has never averaged over 2,000 permits a year (as implemented in some years of the Kern County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts to GHG emissions and global climate change is considered the SJVAB. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects*, would have on GHG emissions and global climate change. As stated previously, climate change is a cumulative and global issue causing global impacts. Thus, a broad geographic scope of analysis is appropriate because climate change is influenced by global emissions and their associated effects.

Impact 4.8-3: Cumulative Greenhouse Gas Emissions Impacts

With regard to impacts on GHG emissions and global climate change, the project has the potential to contribute significantly to cumulative impacts within the region and globally. A complete analysis of the cumulative impacts of oil and gas development in Kern County is provided in Chapter 4.7 *Greenhouse Gas Emissions and Global Climate Change* of the Kern County Oil and Gas EIR.

Emissions of GHGs and their contribution to global climate change are considered a cumulative impact by definition. As shown in Table 4.8-3, the project's total construction GHG emissions would be 27,975 MT CO_2e. Table 4.8-4 shows the project's operational GHG emissions increasing through Capture Year 19, with 4,000,000 MT CO_2e over the 19-year operational lifetime of the project. Additionally, Table 4.8-4 shows total GHG reductions of 40,000,000 MT CO_2e over 19 years from the implementation of the project, resulting in a net reduction in emissions from the

existing sources associated with the Belridge oilfield gas operations baseline. Since the project individually results in a net reduction in GHG emissions, the project would also contribute to reductions in cumulative GHG emissions.

Accounting for permanent CCS and the resulting GHG emissions reductions, the project's cumulative impacts would be less than significant. However, this is contingent upon injected CO_2 remaining in the identified geographically confined reservoir for storage in perpetuity. Should the injected CO_2 fail to remain in the reservoir in perpetuity, GHG emissions from the project would be potentially significant and the project would have the potential to conflict with GHG reduction plans. Implementation of MM 4.8-1 through MM 4.8-6 would greatly reduce the likelihood of CO_2 escaping from the reservoir, but the possibility of a release due to unforeseen circumstances or equipment failure remains. As a result, the project's individual and cumulative impacts would remain significant and unavoidable.

Additionally, impacts from oil and gas development in Kern County on cumulative GHG emissions were determined to remain significant and unavoidable despite the implementation of mitigation measures (Kern County Oil and Gas EIR). The analysis noted that the identified mitigation measures would encourage a reduction in GHG emissions at a regional level, but would not provide a mechanism guaranteeing GHG emission reductions on a cumulative basis. It was also noted that Kern County lacks jurisdiction and control over the many cumulative sources of GHG emissions, including the global source of GHG emissions, that collectively contribute to climate change. While the analysis acknowledged that many other agencies with the requisite jurisdiction are taking steps to reduce GHG emissions, the County could not assure that these steps would ultimately be implemented or sufficient to address global climate change. As a result, impacts from the project on cumulative GHG emissions in combination with impacts from oil and gas development in Kern County on cumulative GHG emissions would remain significant and unavoidable.

CEQA Guidelines Section 15130 notes that sometimes the only feasible mitigation for cumulative impacts may involve the adoption of ordinances or regulations rather than the imposition of conditions on a project-by-project basis. Global climate change is this type of issue. The causes and effects may not be just regional or statewide, they may also be worldwide. Given the uncertainties in identifying, let alone quantifying the impact of any single project on global warming and climate change, and the efforts made to reduce emissions of GHGs from the project through design, in accordance with CEQA Section 15130, any further feasible emissions reductions would be accomplished through CARB regulations adopted pursuant to AB 32.

In conclusion, Impact 4.8-3 would remain significant and unavoidable.

Mitigation Measures

Implement MM 4.8-1 through MM 4.8-6, as described above.

Level of Significance after Mitigation

Cumulative impacts would be significant and unavoidable.

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Section 4.9
Hazards and Hazardous Materials

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Section 4.9

Hazards and Hazardous Materials

4.9.1 Introduction

This section of the Environmental Impact Report (EIR) describes the affected environment and regulatory setting for hazards and hazardous materials in the project area. It also describes the project's potential impacts on sensitive receptors that would result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers) southwest of the community of Lost Hills and west of State Route (SR) 33.

Information in this section is based in part on the Phase I Environmental Site Assessment (ESA) prepared by Stantec Consulting Services Inc. (Stantec) (Stantec 2023) (Appendix F-1), Public Impact Quantitative Risk Assessment prepared by Dixon Risk Consulting (DRC 2023) (Appendix F-2), and publicly available databases including the California Department of Toxic Substances Control's (DTSC) EnviroStor and State Water Resources Control Board's (SWRCB) Geotracker, and the Oil and Gas EIR. *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding oilfield environmental impacts and cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152).

A description of the environmental setting (affected environment) for hazards and hazardous materials is presented in Section 4.9.2, *Environmental Setting*. The regulatory setting applicable to hazards and hazardous materials is presented in Section 4.9.3, *Regulatory Setting*, and Section 4.9.4, *Impacts and Mitigation Measures* discusses project impacts and associated mitigation measures.

Hazards associated with seismic conditions are addressed in Section 4.7, *Geology and Soils*, of this EIR. Although this section does address the impacts of releases of hazardous materials, the impacts of the effects of potential releases relating to water quality and biological resources are also discussed in Section 4.10, *Hydrology and Water Quality*, and Section 4.4, *Biological Resources*, of this EIR.

4.9.2 Environmental Setting

This section defines the existing potential hazards within the project area to establish a baseline from which impacts associated with the project can be measured. A complete description of the project area including the regional location, project boundary, and surrounding land uses is presented in Chapter 3, *Project Description*, of this EIR. The environmental setting for hazardous materials, air traffic, disease vectors, fire hazards, and the unearthing or exposure of hazardous wastes and contaminated soil or groundwater that have the potential to affect human health is presented in this section.

Hazardous Materials and Waste

A hazardous material is any substance that, because of its quantity, concentration, or physical or chemical properties, may pose a hazard to human health and the environment. Under Title 22 of the California Code of Regulations (CCR), the term "hazardous substance" refers to both hazardous materials and hazardous wastes. Both are classified according to four properties: (1) toxicity; (2) ignitability; (3) corrosiveness; and (4) reactivity (CCR Title 22, Chapter 11, and Article 3). A hazardous material is defined in CCR, Title 22 as:

> A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed (CCR, Title 22, Section 66260.10).

Hazardous materials in various forms can cause death, serious injury, long-lasting health effects, and damage to buildings, homes, and other property. Hazards to human health and the environment can occur during the production, storage, transportation, use, or disposal of hazardous materials. The Phase I ESA conducted for the project site was used to determine the potential risks of encountering legacy contaminants at the site.

The DTSC defines hazardous waste as waste with properties that make it potentially dangerous or harmful to human health or the environment. They can be the by-products of manufacturing processes, discarded used materials, or discarded unused commercial products, such as cleaning fluids (solvents) or pesticides. In regulatory terms, hazardous waste is a waste that exhibits one of the four characteristics of a hazardous waste: ignitability, corrosivity, reactivity, or toxicity. However, materials can be hazardous waste even if they are not specifically listed or do not exhibit any characteristics of hazardous waste. For example, "used oil," products, which contain materials on California's M-list (which includes certain wastes known to contain mercury, materials regulated pursuant to the mixture or derived-from rules, and contaminated soil generated from a "clean up") can also be hazardous wastes.

Transportation of Hazardous Materials

Hazardous materials could be shipped to, shipped through, or shipped from the project area within Kern County via truck or rail. Truck transportation of hazardous materials is commonly used for transporting smaller quantities of a product compared to the volume of materials that could be transported by rail. Rail transportation of hazardous materials in the United States is a primary method of moving large quantities of chemicals over long distances.

SR 33 is a two-lane, north–south state highway that transects the project area. The transportation of hazardous materials within the state of California is subject to various federal, State, and local regulations. It is illegal to transport explosives or inhalation hazards on any public highway that is not designated for that purpose, unless the use of a highway is required to permit the delivery or the loading of such materials (California Vehicle Code, Sections 31602 (b) and 32104(a)). The California Highway Patrol (CHP) restricts the transportation of hazardous materials to specific routes. Information on CHP requirements and regulatory authority is provided in Section 4.9.3*, Regulatory Setting*, below. The following paragraphs provide more details about the modes of hazardous material transport in the project area. According to Section 2.5.4 of the Kern County General Plan (KCGP) Circulation Element, I-5 (approximately 8 miles east) is designated as an adopted commercial hazardous materials shipping route.

Hazardous Materials Used in Carbon Capture and Storage

Capture Facilities

The carbon dioxide (CO_2) capture facilities would utilize a traditional amine absorption process. Amines are classified as hazardous under the criteria of the federal Occupational Safety and Health Administration (OSHA) Hazard Communication Standard 29 Code of Federal Regulations [CFR] 1910.1200. Amines are harmful if swallowed and could cause severe skin burns and eye damage. Capturing CO_2 from existing stationary sources would utilize hazardous chemicals typical of an oil production and power generation facility. These chemicals include diluted amine, concentrated amine, caustic, sulfuric acid, calcium chloride, triethylene glycol, corrosion inhibitors, scale inhibitors, brominated biocide, sodium hypochlorite, and citric acid. Each of these chemicals is classified as hazardous under the criteria of the federal OSHA Hazard Communication Standard 29 CFR 1910.1200. Many of these chemicals are harmful if swallowed and could cause skin and eye damage.

Injection Well Drilling

To facilitate drilling and completion operations, temporary facilities, equipment, and materials may be set up and stored on the well pad (for example, drilling mud supplies, water, drilling materials, and casing, crew support trailers, pumps and piping, portable generators, field flares, fuels, and lubricants). Containments (that is, temporary pits, operations sumps, and/or portable tanks) may be set up to store drilling fluids, wellbore cuttings, and drilling wastes. Portable tanks may also be set up to mix and store other needed liquids or slurries, such as drilling fluids and completion fluids.

Table 4.9-1 provides a representative list of materials used in Kern County oil and gas drilling in 2014. Table 4.9-2 shows the planned volume stored, maximum usage, and estimated deliveries per year at each facility for the hazardous chemicals specific to the project.

Table 4.9-1: Representative List of Potentially Hazardous Materials Used in Kern County Oil and Gas Drilling and Production in 2014 Excluding Well Stimulation

Type of Material	Examples of the Material Type
Aerosol	Degreaser, Paints
Compressed Gases	Acetylene, Air, Ammonium Chloride, Anhydrous Ammonia, Argon, Butane, Calibration Gas, CO_2, CO, Chlorine, Helium, Nitrogen, Oxygen, Ethane, Fire Extinguishing Agent, Hydrogen, Isobutane, Butane, Propane, Methane, Nitric Oxide, Mixed Gases Pentane, Sulfur Hexafluoride, Stargon, Welding Gas
Fuel, Oils, and Lubricants	Motor Oils (10/40, 30, 40, 80-90), Gear Oil/Grease/Gear Lube Oil Lube Oil, Synthetic Grease, Diesel (Clear, RRR, #1, #2, Red), Crankcase Oil, Gas Engine Oil (40, 80W90), Cylinder Oil, Compressor Oil, Rock Drill Oil, Turbine Oil, Hydraulic oil, Heat Tran/Oil, Industrial Oil, Jet Oil, Refrigeration Oil, Hydraulic Fluid
Liquid	Acetic Acid, Hydrochloric Acid, Citric Acid, Emulsifiers, Ammonium Products, Biocides, Anti-Foam, Antifreeze, Urea Solution, Aromatic Fluid, Dispersant, Inhibitors, Bacteriacide, Corrosion Inhibitor, Demulsifier, Sulfur Scavenger, Water Clarifier, Scale Inhibitor, Water Additive, Degreaser, Emulsion Breaker, Biocide, Bleach, Flocking Agent, Reverse Emulsion Breaker, Reverse Demulsifier, Asphalt Emulsions, Caustic Soda Liquid, Chlorine, Chelant, Cleaner, Coolant, Defoamer, Anti-Sludging Agent, pH Balancer, Oxygen Scavenger, Cooling Water Treatment, Microbiocide, Paint, Ethylene Glycol, Ethyl Mercaptan, Glycol, H_2S Scavenger, Hydrogen Peroxide, Isopropanol, Isopropyl Alcohol, Naptha, Paraffin Inhibitor, Methanol, Mineral Spirits, Paraffin Dispersant, Polymer, Radiator Fluid, Scale Remover, Soap, Sodium Hydroxide, Sodium Hypochlorite, Sulfide Scavenger, Sulfuric Acid, Surfactant, Triethylene Glycol, Water Clarifier
Liquid Solvent	Cleaning Solvents, Aromatic Solvent, Paraffin Solvent, Cleaning Solvent, Perchloroethylene, Petroleum Distillate, Safety Solvent, Solvents, Stoddard Solvents
Natural Gas	Compressed Natural Gas Liquefied Natural Gas
Natural Gas Condensate	Condensate Treater EA301
Radioactive	Calibration Nuclide V997, Well Logging Nuclide Cy4, Well Logging Nuclide
Solid	Shape Charges, Detonators, Blasting Caps, Polymers, Resins, Batteries, Bactericide, Ignitors, Barite, Acids, Breakers, Emulsifiers, Caustic Soda, Chelating Agents, Stabilizers, Coal, Corrosion Inhibitor, Crosslinkers, Catalysts, Dispersing Agents, Mercaptan, Surfactant, FLOCTREAT, Bulbs, Solvents, Gelling Agents, Graphite, Extender, Acids, Intensifier, Absorbents, Curing Agents, Anti-Microbials, Diverting Agent, Wetting Agents, Oil Filters, Perlite, Explosives, Phase Treat, Polypropylene, Propellants, Primer Cord, Sack Black, SCALE TREAT, SCAVTREAT, Sludge, Soda Ash, Sodium Products, Degreaser

Source: Prepared from hazardous materials inventories obtained from the Kern County Environmental Health Division

Key:

CO = carbon monoxide

CO_2 = carbon dioxide

H_2S = hydrogen sulfide

Table 4.9-2: Capture Facility Chemical Inventory

Name	Volume Stored at Each Facility (bbls)	Maximum Usage at Each Facility (tons per year)	Deliveries Per Year at Each Facility	Delivery Method
Diluted Amine	4,000	N/A	N/A	N/A
Concentrated Amine	500	300	21.4	Bulk, individual delivery
Caustic (50% weight)	500	100	4.8	Bulk, individual delivery
96% Sulfuric Acid	200	150	5.8	Bulk, individual delivery
37% Calcium Chloride	500	500	25.0	Bulk, individual delivery
Triethylene Glycol	300	10	51.9	Individual delivery
Piperazine	200	10	51.9	Individual delivery
Lubricating Oil	10	4	26	Individual delivery
Corrosion inhibitor	10	20	76.1	Common delivery (i.e., same truck and trip)
Scale Inhibitor	10	20	76.1	Common delivery (i.e., same truck and trip)
Brominated Biocide	10	5	19.0	Common delivery (i.e., same truck and trip)
12% Sodium Hypochlorite	10	5	19.0	Common delivery (i.e., same truck and trip)
Reverse Osmosis Dispersant	10	5	19.0	Common delivery (i.e., same truck and trip)
Citric Acid	N/A	2	4.0	Individual delivery
Key: bbls = barrels N/A = not applicable				

Other nonhazardous materials used during oil and gas drilling include clays, sands, cement, diatomaceous earth, salts, cellulose, proppants, limestone, fire retardants, coal, fibers, gums, and fly ash.

Based on hazardous materials inventories obtained from Kern County Environmental Health Division, Table 4.9-3 summarizes the maximum volumes and maximum container size of hazardous and acutely hazardous substances that are stored on site at oilfields in Kern County.

Businesses in California must include a hazardous material inventory disclosure as part of their business plan. The chemicals in the hazardous materials inventory must be reported in gallons, pounds, or cubic feet at standard temperature and pressure. The selected units for each substance are commodity-based, reportable quantities, and how the material is stored.

Table 4.9-3: Maximum Daily On-Site Volumes

Substance	Maximum On-Site Volume	Maximum Container Volume
Produced Water	2,520,000 Gallons	840,000 Gallons
Crude Oil	12,096,000 Gallons	672,000 Gallons
Condensate	89,274,490 Pounds	9,916,100 Pounds
Natural Gas	25,316 Cubic Feet	25,316 Cubic Feet
Gasoline/Diesel	20,000 Gallons	10,000 Gallons
Acetic Acid	22,730 Pounds	2,640 Pounds
Sulfuric Acid 93%	750 Gallons	750 Gallons
Sodium Hydroxide	82,740 Gallons	42,000 Gallons
Explosives	4,000 Pounds	4,000 Pounds
Liquefied Natural Gas	19,000 Gallons	19,000 Gallons
Butane	808,500 Gallons	808,500 Gallons
Acutely Hazardous Materials		
Anhydrous Ammonia	16,500 Pounds	15,000 Pounds
Hydrochloric Acid	831,572 Pounds	15,000 Pounds
Oxygen Difluoride (compressed gas)	500 Cubic Feet	500 Cubic Feet
Acetic Acid 80% in Water (Kern County Environmental Health Division 2014- Peracetic Acid)	990 Gallons	55 Gallons

Source: Prepared from hazardous materials inventories obtained from the Kern County Environmental Health Division.

Hazardous Materials Used for Well Maintenance Activities

Maintenance activities performed on CO_2 injection wells may be required to remove wellbore and near-wellbore damage induced during well construction and injection operations. Well maintenance activities may require the use of chemicals such as hydrochloric acid, hydrofluoric acid, surfactants, and other aqueous or non-aqueous fluids. When chemical treatments are injected into CO_2 injection wells, the chemicals are not returned back to the surface. The chemicals are flushed from the wellbore into the reservoir where reactive chemicals are spent, and the inert fluid is sequestered permanently with the injected CO_2.

Non-Senate Bill (SB) 4 well maintenance activities are excluded from well stimulation treatments (WSTs) by definition in SB 4. WSTs are not required to inject CO_2 and would not be performed in this project. Well stimulation can involve using pressure, heat, or chemicals to increase the flow

of CO_2 into the well. WSTs are designed to enhance injection or production in wells by increasing the permeability of the formation. WST operations are typically performed during initial well completion or workover operations. The operations are a short-term and non-continual process for the purposes of opening and stimulating channels for the flow of CO_2. The primary methods of WSTs used in Kern County are acid-based well stimulation and hydraulic fracturing. No stimulation by hydraulic fracturing would be performed in this project. Some of the same chemicals used in acid-based WST are also used in non-SB 4 routine maintenance activities, though not with the intention to enhance reservoir permeability. Well maintenance activities utilized smaller volumes of chemicals designed only to remove damage within the wellbore and immediate vicinity and do not trigger the application of SB 4.

Hazardous Waste Generated During Oil and Gas Activities, Transport, and Disposal

Nonhazardous Oil and Gas Waste - Storage, Transport, Disposal

Solid and Liquid Wastes

During production, nonhazardous solid wastes fall into two categories: (1) drilling and other wastes associated with exploration and production; and (2) other wastes. This discussion addresses drilling wastes. Wastes, such as construction material and other solid wastes, are discussed in Section 4.19, *Utilities and Service Systems*.

Drilling sumps are used to collect drilling fluids and cuttings, also known as "drilling muds," which are produced during drilling operations. Drilling muds are nonhazardous. Drilling sumps are typically located adjacent to the well pad. Drilling muds must first be dried prior to back-filling. Operations sumps are used to store fluids and solids, which are produced during the life of the operational well as well as potential workover activities. Operations sumps can range from small pits located next to the well to centralized sumps that collect workover fluids at the well site and transfer to centralized sumps for processing. The Central Valley Regional Water Quality Control Board permits the operations of drilling sumps pursuant to statewide general orders, while operations of sumps are permitted through site-specific waste discharge requirements (WDR).

Produced Water

Drilling for oil and gas in California yields a mixture of oil, gas, and water from the formation; the water is separated from the oil and gas and stored in tanks and pits. This water is called "produced water" and is usually very brackish and unsuitable for human use. The water is commingled naturally in the same zone as the oil and natural gas. Produced water is brought up from the formation during oil or gas production and is not considered a hazardous waste. Because it was commingled with hydrocarbons in the formation, the water typically contains chemicals associated with the formations, such as salts, oils and greases, inorganic and organic chemicals, and naturally occurring radioactive material, that exceed State and federal standards for drinking water.

Produced water is managed in a number of ways, including reinjection for disposal or reuse for other purposes, such as steam generation, to support oil and gas production operations. In standard reinjection operations, injection wells may be located within the oilfield. The oil is separated from the water and the water is reinjected into the same formation from which it was originally recovered. In other instances, the produced water may be trucked from treatment tanks on site to commercial injection facilities located apart from the oilfield operations.

Produced water may also be transported, via truck or pipeline to existing wastewater treatment facilities permitted to receive production water for disposal. Produced water collected in tanks is typically re-used for further extraction purposes, stored in surface impoundments where it percolates into groundwater and/or evaporates, or disposed of by injection well. The percolation ponds operate under WDRs issued by the Central Valley Regional Water Quality Control Board (RWQCB). Some produced water requires treatment prior to disposal, and some produced water is treated and reclaimed for other purposes, as discussed further in Chapter 3, *Project Description*, Section 4.10, *Hydrology and Water Quality*, and Section 4.19, *Utilities and Service Systems*.

Waste Gas

Some of the produced gas stream associated with oil production may contain constituents that make it unsuitable for resale or use in on-site facilities. In these instances, the produced gas stream is gathered via small pipelines using a system of vapor recovery units. Waste gas can be transported via pipeline to a dedicated "waste gas" injection well that disposes of the gas into depleted oil reservoirs. Waste gas injection wells are permitted by the California Geologic Energy Management Division (CalGEM) as Class II injection wells. Waste gas may also be transported from the processing facility via pipelines and flared or used for fuel in steam generators.

There are thousands of feet of pipelines conveying oil and gas by-products, including waste gas, throughout the project area. All such pipelines are subject to inspection and testing procedures as required by the CalGEM regulations adopted pursuant to Assembly Bill (AB) 1960 (see CCR, Title 14, § 1774.1.). Under the regulations, "operators shall visually inspect all above-ground pipelines for leaks and corrosion" at least once per year. In addition, CalGEM may order any tests or inspections it deems necessary to establish the reliability of any pipeline system. Following pipeline inspection, repair, replacement, or cathodic protection may be required. Any pipeline that has had a leak in the past, resulting in the release of a reportable quantity, shall be pressure tested by the operator to verify the integrity of the pipe prior to being placed back into active service.

Consistent with the pipeline inspection requirements of the AB 1960 regulations, all operators are required to prepare a pipeline management plan for all pipelines that lists information on each pipeline as well as a description of the testing method and schedule for all pipelines (see CCR, Title 14, § 1774.2.). Moreover, all operators must establish and comply with a written preventive maintenance plan for the prevention of corrosion and leakage, consistent with CCR, Title 14, Section 1777.

Accidents, Upsets, and Safety Issues

General Safety in the Carbon Capture and Storage (CCS) Sector

A review of incidents has been conducted to identify likely hazards associated with the proposed project. There have been a number of industrial and natural releases of CO_2 where injuries and fatalities due to CO_2 inhalation have occurred. Below are details of some CO_2 incidents that illustrate the characteristics of CO_2 releases, and potential impacts on human health and safety, and the environment.

Significant incidents associated with underground natural gas storage, and steam injection into oil and gas production wells for enhanced oil recovery (EOR) have also been identified. These involve different hazardous materials, though both use similar technology for injection into oil and gas reservoirs.

2020 Satartia, Mississippi – 24-inch Pipeline Rupture

In 2007, a 31-mile CO_2 pipeline was built to connect the Tinsley oilfield near Satartia in Mississippi, to a naturally occurring CO_2 gas supply under Jackson, Mississippi for EOR, which ruptured in 2020. The following are the key points from the U.S. Department of Transportation (USDOT) Pipeline and Hazardous Material Safety Administration's (PHMSA's) Office of Pipeline Safety (OPS) – Accident Investigation Division office report (Appendix B-3).

In 2020, Denbury's 24-inch Delhi Pipeline ruptured, releasing liquid CO_2 that immediately began to vaporize at atmospheric conditions. The site of the rupture was on the northeast side of Highway 433, approximately 1 mile southeast of Satartia, Mississippi. Denbury Gulf Coast Pipelines LLC (Denbury) subsequently reported the rupture released an estimated total of 31,4052 barrels of CO_2. Following the accident, investigators from the PHMSA's Accident Investigation Division and Southwest Regional Office, conducted an investigation, including an on-site investigation.

Key Points

- In 2020, a CO_2 pipeline operated by Denbury ruptured in proximity to the community of Satartia, Mississippi. The rupture followed heavy rains that resulted in a landslide, creating excessive axial strain on a pipeline weld.
- CO_2 is considered minimally toxic by inhalation and is classified as an asphyxiant, displacing the oxygen in the air. Symptoms of CO_2 exposure may include headache and drowsiness. Individuals exposed to higher concentrations may experience rapid breathing, confusion, increased cardiac output, elevated blood pressure, and increased arrhythmias. Extreme CO_2 concentrations can lead to death by asphyxiation.
- When CO_2 in a super-critical phase (which is common for CO_2 pipelines) is released into open air, it naturally vaporizes into a heavier-than-air gas and dissipates. During the February 22 event, atmospheric conditions and unique topographical features of the accident site significantly delayed the dissipation of the heavier-than-air vapor cloud. Pipeline operators are required to establish atmospheric models to prepare for

emergencies—Denbury's model did not contemplate a release that could affect the village of Satartia.

- Local emergency responders were not informed by Denbury of the rupture and the nature of the unique safety risks of the CO_2 pipeline. As a result, responders had to guess the nature of the risk, in part making assumptions based on reports of a "green gas" and "rotten egg smell" and had to contemplate appropriate mitigative actions. Fortunately, responders decided to quickly isolate the affected area by shutting down local highways and evacuating people in proximity to the release. Denbury reported on its PHMSA F 7000.1 accident report that 200 residents surrounding the rupture location were evacuated, and 45 people were taken to the hospital. Denbury also reported that to the company's knowledge, one individual was admitted to the hospital for reasons unrelated to the pipeline failure. No fatalities were reported.
- This event demonstrated the need for:
  - Pipeline company awareness and mitigation efforts directed at addressing integrity threats due to changing climate, geohazards, and soil stability issues.
  - Improved public engagement efforts to ensure public and emergency responder awareness of nearby CO_2 pipeline and pipeline facilities and what to do if a CO_2 release occurs. This is especially important for communities in low-lying areas, with certain topographical features such as rivers and valleys.

2020 Yazoo County, Mississippi – A large release to the atmosphere occurred due to a blowdown valve freezing open. Work was being conducted to reconnect the pipeline that had ruptured near Satartia in 2020. An 8-inch valve froze in the open position due to internal dry-ice formation as CO_2 flashed across the valve. A total of approximately 40,000 barrels (5,200 metric tons [MT]) of CO_2 were released over about 24 hours until the pipeline segment pressure had reduced enough to allow the valve to thaw and be closed. A large CO_2 cloud formed, and the nearby highway closed. Air monitoring was conducted in the surrounding area, and personnel were kept at a safe distance.

2015 Aliso Canyon, California, Natural Gas Storage Injection Well Failure

The Aliso Canyon facility in Los Angeles County is one of the largest underground natural gas storage facilities in the United States. Natural gas is stored in a depleted oil and gas sandstone formation at approximately 8,500 feet below ground, with gas being injected and withdrawn through 115 operational wells at the time of the incident. In 2015, there was a well failure, and gas was detected to be leaking from the ground on the hillsides below the wellhead. This incident resulted in a sustained and uncontrolled natural gas leak of approximately 100 thousand tons of methane. Over 5,000 families had to be evacuated, and the well took three and a half months to control.

The well was operated by injection and withdrawal through both the tubing and casing. A single point failure of the well casing allowed gas to escape the well and travel through the rock formation to the surface. The configuration in which both tubing and casing are used for injection and production is non-standard in the oil and gas industry, outside of the underground natural gas storage industry. Typically, oil and gas and production wells only produce fluid through the tubing

and maintain isolation between the tubing and casing. Underground injection control (UIC) injection wells also operate in a similar configuration, where the casing serves as a secondary barrier to monitor for failures.

2013 Louisiana, Abandoned Well Underground CO_2 Blowout

In 2013, an underground CO_2 blowout occurred at the CO_2-EOR Delhi field in Louisiana, when two or more plugged and abandoned wells failed underground. Methane, CO_2, oil, water, brine, and sands migrated to the surface in a sparsely populated, marshy area. The release lasted for more than six weeks and contaminated the air with CO_2 and methane.

2011 Mississippi, Abandoned Well CO_2 Blowout

In 2011, an improperly plugged and abandoned well failed at the CO_2-EOR Tinsley Field, Mississippi. There were incomplete records of abandoned wells at the site. A 2,000-foot-deep well failed when the reservoir pressure increased on the injection of CO_2. The blowout took 37 days to bring under control, sickened one worker, and suffocated deer and other animals.

2008 Mönchengladbach, Germany Incident

During an accident in Mönchengladbach, Germany, in 2008, over 100 residents suffered from respiratory problems due to a CO_2 release, of which 19 were hospitalized. The incident involved the release of about 15 MT (90 barrels) of fire suppression CO_2 inside a factory, which leaked out of the building. At the time there was no wind, so the dense CO_2 cloud drifted downhill to the lowest-lying region where there was a village about 1,500 feet away. The incident illustrated the hazards of CO_2 accumulation in calm or very low wind conditions and the flow of a dense cloud into lower-lying areas.

2004 to 2011 In Salah CCS Project, Algeria

The In Salah CCS demonstration project in Algeria was the first commercial onshore facility to inject CO_2 into a depleted gas reservoir for permanent geological storage. Injection of CO_2 starting in 2004, into a 6,200-foot-deep sandstone formation. During the project, 3.8 million metric tons (MMT) of CO_2 were injected. Extensive monitoring was conducted, including seismic analysis, sampling using gas tracers, downhole logging, surface gas monitoring, and satellite data to monitor surface elevation changes. Monitoring results identified that CO_2 was potentially injected at a rate that caused well pressure to exceed the fracture pressure. Injection was suspended in 2011 after seven years of operations. To date, no leakage has been detected, though satellite monitoring detected deformation of land surfaces, and seismic monitoring indicated possible fracturing.

2002 CO_2 Storage Tank Explosion – Texas

A worker from Reliant Processing in Muleshoe, Texas, was killed when a CO_2 storage tank he was insulating exploded. The explosion was related to a build-up of excessive pressure and brittle fracture of two tanks due to extremely low temperatures. OSHA investigated this incident and reported that the tanks were originally designed for liquefied petroleum gas and were not suitable for minimum CO_2 temperatures.

2000 U.S. Environmental Protection Agency Fire Suppression System CO_2 Incident Assessment

CO_2 has been used for many years in the special hazard fire protection industry worldwide. However, large quantities are needed to suppress a fire. The minimum CO_2 fire suppressant concentration is 34 percent, which is higher than the lethal concentration. In 2000, the U.S. Environmental Protection Agency (EPA) conducted an extensive research project to assess information on deaths, injuries, and the risks associated with the use of CO_2 as a fire suppressant. From 1975 to 1999, a total of 51 CO_2 incidents were identified that reported a total of 72 deaths and 145 injuries resulting from the discharge of CO_2 from fire extinguishing systems. The main cause was determined to be accidental discharge during maintenance or testing. Since the report was published, additional fatal incidents have occurred. The incident in 2008 at Mönchengladbach, Germany, described above was another example of an accidental fire suppressant release.

1988 Storage Tank Explosion, Germany

A similar incident occurred in Worms, Germany, in 1988. A catastrophic pressure failure occurred in a 30 MT capacity CO_2 storage tank due to the vessel relief valve icing up. Five weeks prior to the incident, the vessel had also been exposed to an extremely low temperature. The force of the explosion propelled the vessel nearly 1,000 feet and resulted in three fatalities and eight injuries.

1986 Lake Nyos, Cameroon

Lake Nyos is a volcanic lake that is naturally saturated with CO_2 leaking from the magma chamber below. In 1986, an estimated 1.6 MMT of CO_2 was suddenly released when the lake waters overturned. Over 1,700 people and 3,500 livestock were killed and thousands more were injured as the cloud traveled along the valley for more than 9 miles.

A similar incident occurred in 1984 at Lake Monoun when water overturned in the volcanic lake. The released CO_2 moved out of the crater and hung in a depression along a nearby river, where 37 people were asphyxiated.

The Lake Nyos incident illustrates the dangers of a large CO_2 release. However, the quantities of CO_2 released at Lake Nyos were several orders of magnitude larger than proposed for the CarbonFrontier CCS Project. The pipeline inventory is less than 1,000 MT, and each carbon capture facility contains a CO_2 inventory of less than 50 MT.

1982 Sheep Mountain, Loss of CO_2 Production Well Control

In 1982, a blowout occurred in Sheep Mountain, Colorado, during the drilling of a CO_2 production well into a natural reservoir at depths of 3,300 to 6,000 feet. The CO_2 release rate was estimated to be about 200 million standard cubic feet per day (120 kilograms per second [kg/s]). The high release rate made this a difficult well to kill, although the industry now has a better understanding of managing the control of CO_2 wells.

1930s Crystal Geyser, Abandoned Well

Crystal Geyser in Utah is the largest cold geyser in the world. The geyser was unintentionally created in the 1930s after a prospective oil well was drilled about 2,600-foot-deep into a fault zone

above a natural CO_2 reservoir. Shortly after drilling, the well was abandoned and not properly capped, allowing CO_2 to be released through the well.

Crystal Geyser eruptions last from 7 to 98 minutes with a release rate between 330 and 790 pounds per minute (2.5 and 6 kg/s). Downwind CO_2 concentrations have been measured during eruptions, averaging about 4,000 parts per million (ppm) (0.4 percent) at 160 feet, and 800 ppm at 330 feet. This analysis suggests that even large and rapidly escaping CO_2 from the geyser results in concentrations that are below human health and safety concerns.

Unauthorized Spills, Discharges, and Incidents

Pipeline Spills associated with PHMSA-Regulated Pipelines

Incidents meeting the reporting threshold for USDOT-regulated pipeline systems are reported to the PHMSA of the USDOT. The PHMSA database has been searched for incidents involving pipeline transportation of dense-phase CO_2 during the 20-year period, 2002 to 2021. A total of 100 records were identified, 25 associated with line pipe, and an additional 75 associated with auxiliary equipment such as valves, meter stations, and pressure relief. The releases were categorized by the size of release and mode of failure to assess the likelihood of a release.

Releases have been categorized by the following sizes:

- Pinhole: Failure size smaller or equal to the area of a 0.5-inch-diameter hole
- Crack/Hole: Effective diameter of the failure greater than 0.5 inches and less than the pipeline diameter
- Rupture: Effective failure size the diameter of the pipeline or greater

To ensure consistency within the PHMSA database and for comparison with other data sources, releases reported to the PHMSA were recategorized based on the size of the leak or hole as defined above. For example, some records indicated rupture events which were clearly not full-bore ruptures from the reported hole dimensions and release quantities. Some PHMSA release cause categories were changed in 2010, so adjustments were made for consistency.

The total length of CO_2 pipelines in operation for each year from 2002 to 2021 has been summed from annual USDOT reports submitted by pipeline operators. U.S. operating experience over the 20 years totals 91,000 mile-years. The likelihood of failure has been calculated by release size per 1,000 mile-years of pipeline operation as shown in Tables 4.9-4 and 4.9-5:

Table 4.9-4: USDOT CO_2 Pipeline Data for Years 2002 to 2021

Pipe Release Size	Number of Pipe Release	%	Average Release Size (barrels)	Failure Rate per 1,000 mile-years
	15	60	17	0.164
Pinhole	9	36	105	0.098
Crack/Hole	1	4	9,532	0.011

Table 4.9-4: USDOT CO_2 Pipeline Data for Years 2002 to 2021

	Number of Pipe Release	%	Average Release Size (barrels)	Failure Rate per 1,000 mile-years
Pipe Release Size	15	60	17	0.164
Rupture	**25**			**0.273**
Total	**25**			**0.273**

The number of incidents and pipeline operating miles is limited and, therefore, the failure rates have a high degree of uncertainty. For example, an incident in 2018 involved the failure of a girth weld. The pipeline was out of service due to maintenance activities and being refilled at the time of failure. If operational, this would likely have resulted in a total rupture of the pipeline, doubling the calculated rupture failure rate above.

Dense-phase CO_2 transmission pipelines typically operate at pressures between 1,200 and 2,200 pounds per square inch gauge (psig), with an average maximum allowable operating pressure of about 2,000 psig. The CO_2 pipeline diameters range from 4 to inches, with an average of 17 inches. The average pipeline age is currently 27 years.

Releases associated with pipeline auxiliary equipment have been categorized by the type and size of leak as shown in Table 4.9-5.

Table 4.9-5: USDOT CO_2 Pipeline System Data for Years 2002 to 2021

Auxiliary Equipment Releases	Number of Releases	%	Average Release Size (bbl)
Auxiliary Equipment on Mainline Pipeline, in Right-Of-Way			
Mainline Valve/Flange Leaks	10	13	55
Mainline Relief Valve Failure/Leak	4	5	1,347
Mainline Connection Failure	4	5	2,450
Mainline Auxiliary Valve Frozen	1	1	41,177
Pump/Meter Station Equipment			
Valve/Flange/Weld Leaks	28	37	9
Connection Failure	3	4	8
Pig Launcher/Receiver Leak	7	9	63
Relief Valve Failure/Leak	18	24	261
Total	**75**		

Key:
bbl = barrels
CO_2 = carbon dioxide
USDOT = U.S. Department of Transportation

Releases associated with auxiliary equipment were typically small flange or valve leaks. Medium-sized releases occurred due to the failure of relief valves or connection failures. Approximately 75 percent of these occurred on operator-controlled sites.

The causes of pipeline and auxiliary equipment releases have been categorized as shown in Table 4.9-5. The predominant causes of failure associated with line pipes are external corrosion (40 percent) and material failure (48 percent). The predominant causes of failure associated with auxiliary equipment are gasket and seal leaks, malfunction of control or relief valves, and construction failure.

Over the last 20 years, there have been two major CO_2 pipeline releases in the United States:

- 2020 Satartia, Mississippi – Guillotine failure of 24-inch CO_2 transmission pipeline due to ground movement after heavy rains. This incident is described above in Section 4.9.2, *Environmental Setting*.
- 2020 Yazoo County, Mississippi – A large release to the atmosphere occurred due to a blowdown valve freezing open. Work was being conducted to reconnect the pipeline that had ruptured near Satartia in February 2020. An 8-inch valve froze in the open position due to internal dry-ice formation as CO_2 flashed across the valve. A total of approximately 40,000 barrels (5,200 MT) of CO_2 were released over about 24 hours until the pipeline segment pressure had reduced enough to allow the valve to thaw and be closed. A large CO_2 cloud formed, and the nearby highway closed. Air monitoring was conducted in the surrounding area, and personnel were kept at a safe distance.
- USDOT pipeline incident reports describe releases of CO_2 to have been identified by either flow monitoring equipment, or a visible cloud. Large pipeline failures were identified by supervisory control and data acquisition (SCADA) monitoring systems, which initiated shutdown and isolation of mainline valves. A SCADA system would not be able to detect small leaks, but due to the very low temperature on release, these are likely to be detected by the public or employees. Small above-ground releases have been identified as a result of ice forming on equipment, or the sound of vapor release due to the high-pressure drop, or a low-laying vapor cloud formed by moisture condensing. Below-ground leaks have been reported as a result of vapors seen at ground level, or ice forming on the ground above a leak. One report described the ground heaving above a CO_2 pipeline due to a 4-foot ball of dry ice below the surface.

No significant injuries or fatalities have occurred due to CO_2 pipeline incidents. The Satartia pipeline rupture in February 2020 resulted in a total of 200 residents evacuated and 45 residents taken to the hospital. No residents were admitted due to hazardous material exposure.

Use of Underground Injection Wells

There is insufficient operating experience with EPA UIC Class VI injection wells to predict the likelihood of failure from historical events, and to date, no well blowouts have been reported at dedicated storage sites. However, CO_2 has been injected into active oil and gas production formations for EOR since 1972. A search of incident data has been conducted to identify

significant releases that have occurred, and assess potential consequences associated with the failure of CO_2 injection wells. However, EOR has been prohibited in California in association with carbon capture and storage (CCS) and would not be used in this project. This information is intended to provide facts about failures in CO_2 wells under various circumstances.

Loss of well control events are not normally reported to the National Response Center (NRC) or federal agencies, unless there is an off-site impact. A search of Texas well reports identified four blowouts associated with CO_2-EOR wells over a 10-year period, 2012 to 2021. These were due to wellhead equipment failure, three of which were during well workovers.

Releases may also occur due to a well bore leak and migration to the surface, either through the overlaying formation or via a poorly abandoned well. These incidents result in a slower release, which would be detected by monitoring and unlikely to cause an acute health hazard.

Incidents associated with CO_2-EOR and analogous underground natural gas storage (UNGS) facilities reported in the media include:

- 2016 – Cordona Lake, Texas. A faulty wellhead failed, releasing CO_2 about 20 feet into the air. Hydrogen sulfide (H_2S), CO_2, and hydrocarbon monitoring was conducted, and no hazardous concentrations were detected.
- 2015 – Gaines, Texas. A CO_2-EOR injection wellhead failure occurred during well maintenance. The failure caused a blowout and 25 local homes had to be evacuated for nearly a week. There were no reports of injuries. Most concerns were associated with exposure to H_2S, which was present in the CO_2.
- 2015 – Aliso Canyon UNGS, California. Well casing failure allowed gas to escape the well and travel through the rock formation to the surface. Over 5,000 families had to be evacuated, and the well took three and a half months to control.
- 2001 – Yaggy UNGS Facility, Kansas. Natural gas was injected for storage into salt caverns at a depth of 600 to 900 feet. An injection/production well casing failed, leaking gas into the rock formation. The gas migrated approximately 9 miles underground, and then traveled to the surface through several abandoned brine wellbores. The released gas caused two gas explosions in Hutchinson, Kansas, destroyed buildings, and killed two persons in a mobile home park.

Reports of CO_2 blowouts via the well bore indicate that these incidents may be a concern for acute risks in the local vicinity if close to residents and highways, although releases have mainly dissipated quickly. Well bore leaks may also occur and migrate through the rock formation to the surface. Well casing leaks are likely to migrate slowly to the surface without causing acute health hazards, although these may cause serious hazards if migration to the surface is via an idle or improperly abandoned well.

Existing On-Site Conditions

Historical Property Use

The Belridge oilfields were discovered in the early 1900s, as oil naturally surfaced due to pressure in the geologic reservoir, with the first well drilled along the Chico Martinez Creek in April 1911 (Stantec 2023). Historical sources reviewed as part of the Phase I ESA include aerial photographs, topographic maps, and fire insurance maps. The photos and maps reviewed indicate the project site predominantly comprising undeveloped land. Moderate amounts of petroleum extraction-related development purposes from as early as 1911 through present day. Today, the project area is heavily disturbed with oil wells and well pads, oil and gas infrastructure, gas and steam pipelines, and multiple unnamed dirt or graveled access roads along with a few paved roads.

Recognized Environmental Conditions

A Phase 1 ESA was conducted to determine the presence of existing on-site contamination and/or hazardous materials, referred to as recognized environmental conditions (RECs). The following RECs were identified in the Phase I ESA for the project site:

- The current and historical use of the project site and surrounding land for petroleum hydrocarbon extraction activities, from 1911 to the present, is considered a REC.

- Regulatory records indicate that an area of land to the west of the project site, but likely incorporating the project site, was used as a Class III solid waste landfill until 2007. The area of fill is listed as over 27 acres, to a depth of 10 feet below ground surface, and it is considered likely that portions of the project site occur within this area of fill.

- In addition, historical aerial photography indicates worker residences were demolished in the 1970s and 1980s. Houses constructed prior to this period often contained asbestos-containing materials (ACM) and lead-based paint (LBP) within the building materials. The potential for ACM and LBP to be contained within various areas of fill at the project site, as well as the potential for the fill to be uncompacted and/or uncontrolled, is considered a REC.

- Kern County Environmental Health Services records indicated that a historical waste disposal site is located in the South Belridge oilfield east of the Oasis office building. No additional information was available for this REC.

- A total of 41 wastewater pits used for disposal of "produced water" or for other uses are currently or were historically located within 0.5 miles of the project site. Of these, the majority are either closed former percolation ponds, secondary containment basins, emergency overflow basins, or process basins. Based on the distance, direction, and regulatory status, these sites are not anticipated to represent an environmental concern to the project site.

Hazardous Materials Release Sites in the Area – Cortese List

A records search was conducted of government databases compiled pursuant to the State of California Hazardous Waste and Substances Sites (Cortese) List (Government Code §65962.5) to identify any government-listed hazardous materials or waste sites located on or within a 1-mile radius of the project area. This database search included sites that did not necessarily contain contaminated soil or groundwater but were identified in federal or State databases for compliance with or enforcement of environmental regulations. A search was conducted on January 4, 2024. According to a review of the DTSC EnviroStor database, there are no hazardous release sites located on or within one mile of the project site (DTSC 2024). The SWRCB GeoTracker database identified one Cleanup Program Site located on or within one mile of the project site (SWRCB 2024a). A brief summary of the relevant information obtained is listed below.

- Mobil Exploration and Producing (T0602900394): Leaking Underground Storage Tank Cleanup Site listed as Completed – Case Closed as of May 20, 1991. This site is located in Accessor Parcel Number (APN) 098-111-01. This oilfield facility led to soil contamination from a leaking gasoline pipe (SWRCB 2024b). The cleanup status has been completed and the case closed as of May 20, 1991.

Schools

The County is served by 46 K-12 school districts (KCSS 2022a). The project site is within the McKittrick Elementary and Taft Union High School District boundaries (KCSS 2022b). The closest schools to the project site are Lost Hills Elementary School, A. M. Thomas Middle, Wonderful College Prep Academy - Lost Hills, and McKittrick Elementary School. These schools are located within 10 miles of the project footprint (facility pipeline), and specific distances to each project element are listed in Table 4.9-6.

Table 4.9-6: Active Schools in Proximity to the Project Site

School Name	Student Population (2022-2023)	District	Distance to CUP Boundary (miles)	Distance to Closest Injection Well (miles)	Distance to Closest Facility Pipeline (miles)
Lost Hills Elementary School	180	Lost Hills Union Elementary	6.43	7.09	7.02
A.M. Thomas Middle School	82	Lost Hills Union Elementary	6.49	7.15	7.08
Wonderful College Prep Academy - Lost Hills	504	Kern County Office of Education	7.12	7.68	7.54
McKittrick Elementary School	79	McKittrick Elementary	8.68	17.30	11.41
Buttonwillow Elementary School	313	Buttonwillow Union Elementary	11.58	19.11	14.01

Key: CUP = Conditional Use Permit

Airports

The nearest airport to the project site is the Elk Hills-Buttonwillow Airport, a public airport located approximately 14 miles southeast of the project site. The project site is not located within any safety or noise contour zone for this airport, nor is the project site located within a designated Kern County Airport Land Use Compatibility Plan (ALUCP).

Fire Hazard Areas

The California Department of Forestry and Fire Protection (CAL FIRE) requires counties within the State to develop fire protection management plans that address potential threats of wildland fires. The Kern County Wildland Fire Management Plan identifies federal, State, and local responsibility areas for the entire County to facilitate coordination efforts for fire protection services. The project site is within a State Responsibility Area (SRA) Fire Hazard Severity Zone identified by CAL FIRE as having moderate or high fire risk (CAL FIRE 2024). Impacts related to wildfire hazards are further discussed in Section 4.20, *Wildfire*, of this EIR.

Disease Vectors

A disease vector is an insect or animal that carries a disease-producing microorganism from one host to another. The Federal Insecticide, Fungicide, and Rodenticide Act defines the term vector as "…any organism capable of transmitting the causative agent of human disease or capable of producing human discomfort or injury, including mosquitoes, flies, fleas, cockroaches, or other insects and ticks, mites or rats."

The accumulation of organic wastes would act as attractors for various vectors. In addition, any depressed areas, ponds, or drainage channels would provide areas for the breeding of mosquitoes.

Mosquitoes

Mosquitoes are of particular concern because of their abundance and distribution. In Kern County, mosquitoes are most abundant and active between May and October. Mosquitoes require standing water to breed and can be prolific in areas with standing water, such as wetlands.

Adult female mosquitoes can deposit eggs in a variety of aquatic habitats and other sources that contain water. The immature stages of each mosquito species develop in particular habitats. In general, there are four mosquito habitat groups: agricultural, industrial, domestic, and natural sources. Typical sites within these habitat groups include:

- Agricultural Sources: irrigated pastures, dairies, and orchards.
- Industrial Sources: sewage treatment ponds and drain ditches.
- Domestic Sources: containers, debris in and around ponds, bird baths, pet watering dishes, animal troughs, septic tanks, catch basins, roadside ditches, leaky sprinkler systems, and stagnant swimming pools.
- Natural Sources: wetlands, floodplains, and rain pools.

All species of mosquitoes require standing water to complete their growth cycle. Therefore, any standing body of water represents a potential mosquito breeding habitat. Although mosquitoes typically stay close to suitable breeding habitats and blood-meal hosts, they are known to travel up to 10 miles under breezy conditions. The breeding period for mosquitoes depends on temperature but generally occurs from March through October.

Water quality also affects mosquito reproduction. Generally, poor-quality water (for example, water with limited circulation, high temperature, and high organic content) produces greater numbers of mosquitoes than high-quality water (for example,water with high circulation, low temperature, and low organic content). Typically, water bodies with water levels that slowly increase or recede produce greater numbers of mosquitoes than water bodies with water levels that are stable or that rapidly fluctuate.

In Kern County, the Kern Mosquito and Vector Control District is responsible for vector control; however, there is no established vector control district in the area of Kern County where the project would be located.

Mosquito Hazards

Mosquito-Borne Diseases

Mosquitoes are known to be the carriers of many serious diseases.

West Nile virus is the most important mosquito-borne disease affecting Kern County. In 2023, there were 360 human West Nile virus infections in California and 11 deaths (CDPH 2024). Of these cases, 15 (4.2 percent) were in Kern County.

In September 2002, the Kern County Department of Health formed a West Nile Virus Task Force and subsequently released reports documenting cases, developed strategies to prevent the occurrence of West Nile virus, and generated public education information, such as information pamphlets. Statewide, there are 52 local agencies, including local mosquito abatement districts and the California Department of Health Services Arbovirus Field Testing Stations, that work cooperatively to routinely conduct surveillance and control of mosquitoes and the diseases they transmit throughout California.

Mosquito Species of Concern

In Kern County, two species of mosquito are primary targets for suppression. These two species, *Culex pipiens quinquefasciatus* and *Culex tarsalis*, are potential vectors of encephalitis and West Nile virus. Other species of mosquitoes exist in Kern County that can cause a substantial nuisance in surrounding communities, but the *Culex* mosquito is the primary vector species of concern.

Although the West Nile virus can be transmitted by a number of mosquito species, *Culex* is the most common carrier. This disease is thought to be a seasonal epidemic that flares up in the summer and fall. West Nile virus is spread when mosquitoes that feed on infected birds bite humans and other animals.

The encephalitis mosquito (*Culex tarsalis*) breeds in almost any freshwater pond. Birds appear to be the primary blood-meal hosts of this species, but the insect will also feed on domestic animals and humans (Bohart and Washino 1978). This species is the primary carrier in California of western equine encephalitis, St. Louis encephalitis, and California encephalitis, and is considered a significant disease vector of concern in the state.

The house mosquito (*Culex pipiens quinquefasciatus*) usually breeds in waters with a high organic material content. This species is often identified by its characteristic buzzing. Although its primary blood-meal host is birds, the house mosquito may also seek out humans. The house mosquito is a vector of St. Louis encephalitis.

Flies

Nuisance flies have a life cycle comprised of an egg stage, three larval stages, a pupal stage, and an adult stage. Eggs are laid by a mature female fly onto a substrate appropriate for larval development. A single female can lay hundreds of eggs during her life. Nuisance fly larvae (grubs) are generally white in color and are blunt-ended. They develop in wet substrates, especially dung pats and manure and wet or rotting feed, hay, and bedding straw, where they feed on food particles found on the substrate. Fly larvae are not capable of developing in truly aqueous habitats; they need wet, but not overly wet, substrates.

Within the confines of a pupal case, the developing fly will undergo further changes to become a winged adult fly that will eventually emerge from the pupal case and disperse from the site. The length of time required to complete the development from egg to adult is temperature dependent and may be as short as seven days during the summer months in California.

Some nuisance flies are blood feeders and can inflict a painful bite while feeding on animals or humans. Blood-feeding (or biting) flies include the stable fly and horn fly. Other flies do not bite (non-biting flies), instead feeding on body secretions or liquefied organic matter. Non-biting flies include the house fly, face fly, and garbage fly.

Adult flies are generally active during daylight hours and inactive at night. Nuisance flies are known to disperse from their development sites into surrounding areas; however, the distance and direction of dispersal are not well understood. Non-biting nuisance fly species are likely to disperse further than those fly species that require animal blood meals. The habitat surrounding a breeding site will play a role in the distance of nuisance fly dispersal. Nuisance flies will likely disperse further in open habitats typical of rangeland and low agricultural crops than they will in urban or forested/orchard areas that contain substantially more vertical structures on which flies may rest and that provide shade and higher humidity on hot summer days.

Most nuisance flies are not known to disperse great distances. Studies using marked house flies show that 60 percent to 80 percent of house flies were captured within 1 mile of their release point; 85 percent to 95 percent were caught within 2 miles of the release site within the first four days after they were turned loose. A few flies have been shown to travel further, but in general, fly control efforts for a community problem are focused within 1 mile of the source.

Rodents

The accumulation of organic waste presents the potential for significant populations of mice and rats. Rodents can spread or accelerate the spread of disease from contaminated areas to uncontaminated areas via their droppings, feet, fur, urine, saliva, or blood. In addition, mice provide a food source that could attract wild predatory animals (for example, skunks, foxes, coyotes, and stray dogs), which could pose other disease problems.

Mice are generally nocturnal and secretive animals with keen senses of taste, hearing, smell, and touch. They are small enough to enter any opening larger than one-quarter of an inch. Mice prefer cereal grains, if available, but will eat garbage, insects, meat, and even manure. Mice reproduce at high rates, making early control important in minimizing the potential for infestation. Although the life span of a mouse is only nine to 12 months, a female mouse can have five to 10 litters per year with five or six young in each litter. Mice do not consume large quantities of food but can cause significant economic damage due to physical structure damage and site contamination.

4.9.3 Regulatory Setting

Federal

U.S. Environmental Protection Agency (EPA)

The EPA was established in 1970 to consolidate in one agency a variety of federal research, monitoring, standard-setting, and enforcement activities to ensure environmental protection. The EPA's mission is to protect human health and to safeguard the natural environment—air, water, and land—upon which life depends. The EPA works to develop and enforce regulations that implement environmental laws enacted by Congress, is responsible for researching and setting national standards for a variety of environmental programs, and delegates to states and tribes the responsibility for issuing permits and for monitoring and enforcing compliance. Where national standards are not met, the EPA can issue sanctions and take other steps to assist the states and tribes in reaching the desired levels of environmental quality.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)/Superfund Amendments and Reauthorization Act

CERCLA, commonly known as Superfund, was enacted by Congress on December 11, 1980. This law (United States Code [U.S.C.] Title 42, Chapter 103) provides broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA establishes requirements concerning closed and abandoned hazardous waste sites; provides for liability of persons responsible for releases of hazardous waste at these sites; and establishes a trust fund to provide for cleanup when no responsible party can be identified. CERCLA also enables the revision of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The NCP (40 CFR, Part 300) provides the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, and/or contaminants. The NCP also established the National Priorities List.

CERCLA was amended by the Superfund Amendments and Reauthorization Act (SARA) on October 17, 1986.

Emergency Planning and Community Right-to-Know Act

Under the Emergency Planning and Community Right-to-Know Act, or Title III of the SARA, the EPA requires local agencies to regulate the storage and handling of hazardous materials and requires the development of a plan to mitigate the release of hazardous materials. Businesses that handle any of the specified hazardous materials must submit to government agencies (i.e., fire departments or public health departments), an inventory of the hazardous materials, an emergency response plan, and an employee training program. The business plans must provide a description of the types of hazardous materials/waste on site and the location of these materials. The information in the business plan can then be used in the event of an emergency to determine the appropriate response action, the need for public notification, and the need for evacuation.

In 1990, Congress passed the Pollution Prevention Act which requires facilities to report additional data on waste management and source reduction activities to the EPA under the Toxics Release Inventory Program. The goal of the Toxics Release Inventory is to provide communities with information about toxic chemical releases and waste management activities and to support informed decision-making at all levels by industry, government, non-governmental organizations, and the public.

Clean Water Act/Spill, Prevention, Control, and Countermeasure Rule

The Clean Water Act (CWA) (33 U.S.C. Section 1251 et seq.) was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (CWA Section 402). In California, NPDES permitting authority is delegated to, and administered by, the nine RWQCBs. The project is within the jurisdiction of the Central Valley RWQCB. Section 402 of the CWA authorizes the California SWRCB to issue NPDES General Construction Storm Water Permit (Water Quality Order 99-08-DWQ), referred to as the "General Construction Permit." Construction activities can comply with and be covered under the General Construction Permit provided that they:

- Develop and implement a Storm Water Pollution Prevention Plan (SWPPP) that specifies best management practices (BMPs) that will prevent all construction pollutants from contacting stormwater and with the intent of keeping all products of erosion from moving off-site into receiving waters.
- Eliminate or reduce non-stormwater discharges to storm sewer systems and other waters of the nation.
- Perform inspections of all BMPs. NPDES regulations are administered by the RWQCB.

- Projects that disturb one or more acres are required to obtain NPDES coverage under the Construction General Permits.

Other federal regulations overseen by the EPA relevant to hazardous materials and environmental contamination include Title 40 CFR Chapter 1, Subchapter D – Water Programs, and Subchapter I – Solid Wastes. Title 40 CFR Chapter 1, Subchapter D, Parts 116 and 117 designate hazardous substances under the CWA. Title 40 CFR Part 116 sets forth a determination of the reportable quantity for each substance that is designated as hazardous. Title 40 CFR Part 117 applies to quantities of designated substances equal to or greater than the reportable quantities that may be discharged into waters of the United States.

The Safe Drinking Water Act of 1974 (42 U.S.C. §300f et seq.)

The Safe Drinking Water Act (SDWA) regulates the amount of toxic substances in drinking water sources. The SDWA requires the EPA to develop minimum federal requirements for UIC programs and other safeguards to protect public health by preventing injection wells from contaminating an underground source of drinking water (USDW). The UIC sections are:

1421 – Identifies what State regulations must include in their UIC program.

1422 – Outlines the process for State primacy applications including timelines and public participation requirements.

1423 – Sets forth enforcement of the program.

1425 – Describes optional demonstrations a state may make for the portion of the UIC Program relating to oil and natural gas operations.

1426 – Requires the administrator to determine the applicability of monitoring methods.

1431 – Authorizes emergency powers for EPA to take action in a state if there is an imminent and substantial endangerment.

1442 – Addresses the EPA's authority to conduct research, studies, training, and demonstrations, specifically looking at improved methods for protecting USDWs.

1443 – Establishes grants for primacy programs.

The EPA developed the UIC Program requirements, but states, territories, and tribes can obtain primary enforcement responsibility or primacy. State regulations must be as stringent as federal requirements but may be more stringent.

Pipelines

United States Department of Transportation

The USDOT was established by an act of Congress in 1966. It is mandated to oversee hazardous liquid pipeline safety under the U.S.C. Title 49, Chapter 601. PHMSA acting through the OPS administers the national regulatory program to ensure the safe transportation of refined petroleum products and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities in conjunction with the Technical Hazardous Liquids Pipeline Safety Standards Committee, which provides peer review.

Many of these regulations are written as performance standards, which set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety. Pipelines are inspected and monitored by the western region of the PHMSA or by State-delegated officials. Inspectors conduct inspections during construction to ensure that the design, materials, construction methods, welding procedures, and testing meet the USDOT standards. Following construction, PHMSA inspectors inspect the pipeline. The inspections include a review to ensure compliance with 49 CFR 195, specifically, the inspections review the operation and maintenance procedures, abnormal and emergency operating procedures, damage prevention and public education procedures, and the inspection ensures the pipeline repair and operations are in compliance.

The National Response Framework (NRF) is part of the National Strategy for Homeland Security. The NRF formally replaced the National Response Plan in March 2008. Building on the principles outlined in the National Incident Management System, as well as the Incident Command System, the NRF's coordinating structures are effective procedures for the coordination of any level at any time, for the response activities among federal, State, and local response agencies (for example, police, firefighting, emergency management, and first responder). The Oil and Hazardous Materials Incident Annex (Emergency Support Function #10) of the NRF directs the federal, State, and local authorities to conduct training, plan and execute field exercises, share lessons learned, and, in general, develop and maintain specific procedures for responses to incidents of regional and national significance.

Transportation of Hazardous Liquids by Pipeline, 49 CFR 195, includes detailed requirements on a range of safety and environmental protection issues related to liquids pipelines. Part 195.30 incorporates many of the applicable national safety standards of the American Petroleum Institute (API), American Society of Mechanical Engineers, American National Standards Institute, and American Society for Testing and Materials. Table 4.9-7 lists portions of 49 CFR 195 that are relevant to this project.

Table 4.9-7: Key Elements of the Transportation of Hazards Liquids by Pipeline Regulations

Component of 49 CFR 195	Key Elements and Thresholds; Applicable Permits
Part 195.50 Reporting Accidents	Requires reporting of accidents by telephone and in writing for: • Explosion or fire not intentionally set by the operator; • Spills of 5 gallons or more or 5 barrels if confined to company property and cleaned up promptly; • Daily loss of 5 barrels a day to the atmosphere; • Death or injury necessitating hospitalization; or • Estimated property damage, including cleanup costs, greater than $50,000
Subpart C Design Requirements Parts 195.100 through 195.120	Design requirements for the temperature environment, variations in pressure, internal design pressure for pipe specifications, external pressure and external loads, new and used pipe, valves, fittings, and flanges, internal inspection devices
Subpart D Construction Parts 195.200-195.266	Construction requirements for standards such as compliance, inspections, welding, siting and routing, bending, welding and welders, inspection and nondestructive testing of welds, external corrosion, and cathodic protection, installing in-ditch and covering, clearances and crossings, valves, pumping, breakout tanks, and construction records
Subpart E – Pressure Testing Parts 195.300-195.310	Minimum requirements for hydrostatic testing, compliance dates, test pressures and duration, test medium, and records
Subpart F-Operation and Maintenance Parts 195.400-195.466	Minimum requirements for operating and maintaining steel pipeline systems, including: • Correction of unsafe conditions within a reasonable time • Procedural manual for operations, maintenance, and emergencies • Training • Maps • Maximum operating pressure • Communication system • Cathodic protection system • External and internal corrosion control • Valve maintenance • Pipeline repairs • Overpressure safety devices • Firefighting equipment • Public education program for hazardous liquid pipeline emergencies and reporting

Gathering lines are small-diameter pipelines that transport petroleum products or natural gas from a production facility or wellhead to a central collection point. They often operate at relatively low pressures and flow and are significantly smaller in diameter than transmission lines. Gathering

lines in rural oilfield settings are regulated by CalGEM under the AB 1960 regulations. The PHMSA regulates gathering lines for hazardous liquids in non-rural areas. Rural gathering lines for hazardous liquids are regulated if they are of a certain size and pressure and are located within a ¼ mile of unusually sensitive areas, such as key drinking water sources or critical ecological communities. Operators must determine if an onshore pipeline (or part of a connected series of pipelines) is an onshore gathering line using the API Recommended Practice 80, "Guidelines for the Definition of Onshore Gas Gathering Lines," (first edition, April 2000). This is done using criteria that determine when a gas gathering pipeline is close enough to a number of homes or areas/buildings where people congregate, in which an accident on the pipeline could impact them. If the criteria are met, these natural gas gathering pipelines, that operate at lower pressures, must comply with a subset of the requirements specified in 49 CFR 192.9. This section contains the required gathering line information for the operators of on-shore, off-shore, Type A, or Type B lines. An operator of a new, replaced, relocated, or otherwise changed line must be in compliance with the applicable requirements in this section by the date the line goes into service.

Pipeline Safety Improvement Act

In 2002, the U.S. Congress passed the Pipeline Safety Improvement Act (PSIA) of 2002, HR 3609, to strengthen the nation's pipeline safety laws. Under the PSIA, gas transmission operators are required to develop and follow a written integrity management program containing all the elements described in Part 192.911 of the USDOT regulations (49 CFR) to address the risk on all transmission pipeline segments of High Consequence Areas (HCAs). Specifically, the law establishes an integrity management program that applies to all HCAs.

The USDOT's OPS outlines pipeline design requirements that are based on population density in the region and, generally, more stringent design requirements correspond to areas with higher population densities (49 CFR 192.1). Areas in the vicinity of the pipeline are divided into "class location units." A unit is defined in 49 CFR 192 as "an on-shore area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline." Class location units are therefore confined to the area within 660 feet of 1 mile of contiguous pipeline. Class location units are considered HCAs if the area contains 46 or more buildings intended for human occupancy; is within 100 yards of either a building, or a small well-defined outside area, such as a playground, recreation area, outdoor theater, or other place of public assembly; or where buildings with four or more stories above-ground are prevalent.

Hazardous Liquid Pipeline Safety Act

The Hazardous Liquid Pipeline Safety Act of 1979 and its amendments authorize the USDOT to regulate pipeline transportation of hazardous liquids (including crude oil, petroleum products, anhydrous ammonia, and CO_2). Key elements of the Hazardous Liquid Pipeline Safety Act of 1979 and its amendments are summarized in Table 4.9-8.

Table 4.9-8: Key Elements of the Pipeline Safety Regulations

Law/Regulation	Key Elements
Federal	
Pipeline Inspection, Protection, Enforcement, and Safety Act of 2006 (PIPES- Public Law 109-468, December 2006)	Provides for advanced safety and environmental protection in pipeline transportation. Increases the transparency of pipeline safety evaluation. Provides funding for future pipeline safety studies.
Pipeline Safety Act of 1994 49 U.S.C. § 60101 et seq.	Defines the framework for pipeline safety regulation in the United States.
49 CFR Part 195- Transportation of Hazardous Liquids by Pipeline	This section describes the safety standards and reporting requirements for hazardous liquid pipelines. These regulations include detailed requirements on a range of topics related to safety and environmental protection. This section also includes the minimum requirements for operator qualification of individuals performing tasks required by the regulations.

Key:
CFR = Code of Federal Regulations
U.S.C. = United States Code

Hazardous Waste Handling Requirements

Hazardous Materials Transportation Act (P.L. 93-933, January 1975)

The Hazardous Materials Transportation Act (HMTA) is the federal legislation that regulates the transportation of hazardous materials. The primary regulatory authorities are the USDOT, the Federal Highway Administration, and the Federal Railroad Administration (FRA). The Secretary of the USDOT receives the authority to regulate the transportation of hazardous materials from the HMTA, as amended and codified in 49 U.S.C. 5101 et seq. The PHMSA (formerly the Research and Special Provisions Administration) was delegated the responsibility to write the hazardous materials regulations, which are contained in 49 CFR Parts 100-180. The HMTA requires that carriers report accidental releases of hazardous materials to the USDOT at the earliest practical moment but no later than 12 hours after the occurrence of any incident (49 CFR Subtitle B, Chapter 1, Subchapter C, Part 171.15 Subpart B). Other incidents that must be reported include deaths, injuries requiring hospitalization, and property damage exceeding $50,000.

Under the HMTA, the USDOT regulates the transportation and handling of "reportable quantities" of hazardous substances. These regulations focus on the transportation of hazardous materials by:

- Carriers by rail, aircraft, and vessel
- Interstate and foreign carriers by motor vehicle
- Intrastate carriers by motor vehicle so far as the regulations relate to hazardous wastes, hazardous substances, and flammable cryogenic liquids in portable tanks and cargo tanks

The transportation of hazardous materials within the state of California is subject to various federal, State, and local regulations. It is illegal to transport explosives or inhalation hazards on any public highway not designated for that purpose, unless the use of the highway is required to

permit the delivery or the loading of such materials (California Vehicle Code §§ 31602[b], 32104[a]).

The CHP designates through routes to be used for the transportation of hazardous materials. Transportation of hazardous materials is restricted to these routes except in cases where additional travel is required from that route to deliver or receive hazardous materials to and from users. Information on CHP requirements and regulatory authority is provided in Section 4.9.3, *Regulatory Setting*, below.

Resource Conservation and Recovery Act (40 CFR §240-299)

The Resource Conservation and Recovery Act (RCRA) grants authority to the EPA to control hazardous waste from start to finish. This covers the production, transportation, treatment, storage, and disposal of hazardous waste. The RCRA also sets forth a framework for the management of nonhazardous solid waste. RCRA allows individual states to develop their own programs for the regulation of hazardous waste as long as they are at least as stringent as RCRA. The State has developed the California Hazardous Waste Control Law (Health and Safety Code [HSC] sec. 25100 et. Seq. And 22 CCR sec. 66260.1 et seq.) and the EPA has delegated authority for RCRA enforcement to the State. Primary authority for the statewide administration and enforcement of California Hazardous Waste Control Law rests with the California Environmental Protection Agency's (CalEPA) DTSC. RCRA was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the "cradle to grave" system of regulating hazardous wastes. The 1986 amendments to the RCRA enabled the EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances.

Associated Hazardous and Solid Waste Amendments (40 CFR 260)

Under RCRA, individual states may implement their own hazardous waste programs instead of RCRA, as long as the State program is at least as stringent as the federal RCRA requirements. California's DTSC administers and enforces the federal hazardous waste regulations, in addition to more stringent State hazardous waste regulations. The State chapter in this section is the Hazardous Waste Control Act of 1972. This Act is the California Waste Management program, which is similar to, but more stringent than, the RCRA program requires.

RCRA was amended by the Associated Hazardous and Solid Waste Amendments (HSWA), which affirmed and extended the concept of regulating hazardous wastes from generation through disposal. HSWA specifically prohibits the use of certain techniques for the disposal of some hazardous wastes. 40 CFR, Part 260.1, and Part 260.2 provide the guidelines to establish a Hazardous Waste Management System. Part 260.1 defines the terminology, requirements, and guidelines necessary to track hazardous waste activities, treatment, storage, and disposal facilities and keep certain records plus submit reports to the EPA at regular intervals. Part 260.2 addresses the availability or confidentiality of information available to the public including both written and electronic hazardous waste manifest.

Hazardous Materials Transportation

The Hazardous Materials Transportation Act, 49 CFR 171, Subchapter C

The USDOT, Federal Highway Administration, and the FRA regulate the transportation of hazardous materials at the federal level (State requirements are discussed in the following sections). The HMTA requires that carriers report accidental releases of hazardous materials to the USDOT at the earliest practical moment. Other incidents that must be reported include deaths, injuries requiring hospitalization, and property damage exceeding $50,000. The USDOT also specifies the types of cars that must be used to ship crude oil and other materials.

The FRA authorizes the Hazardous Materials Division to administer a safety program, under the Federal Hazardous Materials transportation law (49 U.S.C. § 5101 et seq.), that oversees the movement of hazardous materials (including dangerous goods), such as petroleum, chemical, and nuclear products, throughout the nation's rail transportation system. The FRA's hazardous materials inspection program is primarily responsible for monitoring compliance pursuant to the hazardous materials regulations found in 49 CFR Parts 171–180, including in particular, 49 CFR Part 174, Carriage by Rail. Part 174 includes restrictions on the types of hazardous materials that may be shipped, tank car specifications, requirements for labeling, handling, loading, unloading and storage, and requirements for safety and security inspections. In addition, specific handling and tank car requirements are prescribed for explosives, gases, flammable liquids, and poisonous and radioactive materials. FRA inspectors are authorized to inspect railroad or other facilities and all pertinent documents related to hazardous materials transportation to verify compliance with the hazardous materials regulation. Additionally, the FRA has an obligation to investigate possible violations at points where shipments originate and monitor compliance on a regular basis (FRA 2011).

Worker Health and Safety

Occupational Safety and Health Act (29 U.S.C. 651-678)

Under the authority of the Occupational Safety and Health Act of 1970, OSHA, a division of the Department of Labor, established health and safety standards for the workplace, including the accidents and occupational injuries reporting requirements. Relevant regulations include those related to hazardous materials handling, employee protection requirements, first aid, and fire protection, as well as material handling and storage. Relevant portions are summarized below.

Hazard Communication (29 CFR 1910.1200)

The purpose of this section is to ensure that the hazards of all chemicals produced or imported are classified, and that information concerning the classified hazards is transmitted to employers and employees. The requirements of this section are intended to be consistent with the provisions of the United Nations Globally Harmonized System of Classification and Labeling of Chemicals, Revision 3. The transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which include container labeling and other forms of warning, safety data sheets, and employee training.

Process Safety Management of Highly Hazardous Materials, 29 CFR 1910.119

This regulation establishes requirements for preventing or minimizing the consequences of catastrophic releases of toxic, flammable, reactive, or explosive materials. The Process Safety Management regulation requires compiling process safety information, conducting process hazard analyses, written operating procedures, employee training and participation programs, pre-startup safety reviews, evaluation of mechanical integrity of critical equipment, contractor requirements, written procedures for managing change, hot work permit systems, incident investigations, emergency action plans, and compliance audits.

Airports

Federal Aviation Administration

The Federal Aviation Administration (FAA) regulates aviation at regional, public, private, and military airports. The FAA regulates objects affecting navigable airspace and structures taller than 200 feet according to Federal Aviation Regulation 14 CFR Part 77. The U.S. and California Departments of Transportation also require the proponent to submit FAA Form 7460-1, Notice of Proposed Construction or Alteration. According to 14 CFR Part 77.5, notification allows the FAA to identify potential aeronautical hazards in advance, thus preventing or minimizing any adverse impacts on the safe and efficient use of navigable airspace. Any structure that would constitute a hazard to air navigation, as defined in 14 CFR Part 77, requires issuance of a permit from the California Department of Transportation's (Caltrans's) Aeronautics Program. The permit is not required if the FAA aeronautical study determines that the structure has no impact on air navigation.

State

Federal statutes establish national standards for the transportation, emission, discharge, and disposal of harmful substances; however, implementation and enforcement of many of the large programs have been delegated to the states by the EPA. In general, states set stricter standards than those required by federal law. Some of the programs delegated to the states are the emissions standards, the water quality standards and the NPDES Programs under the CWA, the hazardous waste program under RCRA, and the drinking water and UIC programs under the SDWA (Brown, n.d.). In addition, State laws address gas and liquid pipelines, oil and gas facilities, and hazardous materials and waste. Each of these is discussed below.

Hazardous Materials and Hazardous Waste

Whether a material is deemed a hazardous material and/or a hazardous waste determines which state regulation will apply to it. According to HSC § 25124, materials become waste when the materials are disposed of, burned or incinerated, or accumulated, stored or treated before or in lieu of being disposed of, burned or incinerated. Recyclable materials that are managed as provided in HSC § 25143.2 and 25143.9 are excluded from classification as waste. A hazardous waste is a waste that because of its quantity, concentration, or physical, chemical, or infectious characteristics may either:

- Cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness.
- Pose a substantial present or potential hazard to human health or the environment, due to factors including, but not limited to, carcinogenicity, acute toxicity, chronic toxicity, bioaccumulative properties, or persistence in the environment, when improperly treated, stored, transported, disposed of, or otherwise managed (HSC § 25117; 25141).

Hazardous Materials Release Response Plans and Inventory Act of 1985

The Hazardous Material Release Response Plans and Inventory Act (HSC, Division 20, Chapter 6.95, Sections 25500-25547.8) also known as the Business Plan Act (HSC, Division 20, Chapter 6.95, Sections 25500-25519) requires businesses using hazardous materials to prepare a plan that describes their facilities, inventories, emergency response plans, and training programs. Hazardous materials are defined as raw or unused materials that are hazardous and are part of a process or manufacturing step. Specifically, the California HSC Sections 25503 and 25505 require facilities that store hazardous materials in excess of 55 gallons, 500 pounds, or 200 cubic feet to submit Hazardous Materials Business Plans (HMBPs) to the Certified Unified Program Agency (CUPA). This plan must include a hazardous materials inventory and address emergency response, planning, training, and evacuation.

Uniform Fire Code--Hazardous Materials Management Plan, Hazardous Materials Inventory Statement

The Uniform Fire Code (UFC) prescribes regulations that are consistent with best practices to address fire and explosion hazards that can arise from the storage, handling, and use of hazardous substances, materials, and devices. The State Fire Marshal has adopted the UFC, with amendments, as the California Fire Code. Local fire departments are required to adopt local fire codes that are no less stringent than the California Fire Code (Brown, n.d.).

According to Section 8001.3.1, a permit is required to store, use, or handle hazardous material in excess of specified quantities. A local Fire Chief may require permit applicants to prepare a Hazardous Materials Management Plan (HMMP) (Section 8001.3.2a) and a Hazardous Materials Inventory Statement (HMIS) (Section 8001.3.3a). These documents are consistent with the HMBP (Brown, n.d.).

Hazardous Materials Transportation in California

California regulates the transportation of hazardous waste originating or passing through the state in Title 13 of the CCR. The CHP and Caltrans have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies. Caltrans sets standards for trucks in California. The regulations are enforced by the CHP. Common carriers are licensed by the CHP, pursuant to the California Vehicle Code, §32000.5. This section requires licensing of every motor (common) carrier who transports in excess of 500 pounds of hazardous materials at one time or hazardous materials shipments that require placards.

Under the RCRA, the EPA sets standards for transporters of hazardous waste. In addition, California regulates the transportation of hazardous waste originating or passing through the state; state regulations are contained in the CCR, Title 13. Hazardous waste must be regularly removed from generating sites by licensed hazardous waste transporters. Transported materials must be accompanied by hazardous waste manifests and spills or discharges must be reported.

Hazardous Waste Control Act of 1972 (HSC Division 20, Chapter 6.5)

The Hazardous Waste Control Act established the State hazardous waste management program, which is similar to, but more stringent than RCRA program requirements. The Hazardous Waste Control Law regulates the management of hazardous waste under HSC, Division 20 Chapter 6.5. This law defines hazardous wastes and the procedures for the handling, transportation, and disposal of hazardous waste. The implementing regulations prescribe management practices for hazardous wastes; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous wastes that cannot be disposed of in landfills. Hazardous waste is tracked from the point of generation to the point of disposal or treatment using hazardous waste manifests. The manifests list a description of the waste, its intended destination, and regulatory information about the waste. The hazardous waste control program is administered by the State DTSC and by local CUPAs.

Title 22 of the CCR Division 4.5, Environmental Health Standards for Management of Hazardous Waste provides the regulatory requirements for the implementation of the law. Chapter 11 defines a waste as hazardous if it has any of the following characteristics: ignitability, corrosivity, reactivity, and toxicity. Article 3 provides detailed definitions of each characteristic. Articles 4 and 5 provide lists of RCRA hazardous wastes, non-RCRA hazardous wastes, hazardous wastes from specific sources, extremely hazardous wastes, hazardous wastes of concern, and special wastes. Chapters 12, 13, and 14 provide the standards for hazardous waste generators and transporters as well as for the owners of transfer, treatment, storage, and disposal facilities.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program)

Senate Bill 1082 of 1993 (HSC Chapter 6.11) required the Secretary of the CalEPA to establish a "unified hazardous waste and hazardous materials management" regulatory program (Unified Program) by January 1, 1996. Currently, there are 83 CUPA in California. All counties have been certified by the Secretary. The *Unified Program* consolidates, coordinates, and makes consistent six existing programs.

The Unified Program provides for local implementation of the following six state and federal regulatory programs:

- The Above-ground Storage Tank program (and its Spill, Prevention, Control, and Countermeasures [SPCCs])
- The Hazardous Materials Release Response Plan and Inventory Program (Business Plan)
- The California Accidental Release Prevention Program (CalARP)

- The California UFC, HMMP, and HMIS
- The Underground Storage Tank (UST) program
- The Hazardous Waste Generator and On-site Hazardous Waste Treatment program (tiered permitting)

The local implementing agencies are known as CUPAs or participating agencies (PAs) (Brown, n.d.).

Hazardous Waste and Substances Sites (Cortese) List (California Government Code §65962.5)

This State code requires the State to compile a hazardous waste and substance list. The Cortese List is a planning document used to comply with the CEQA requirements by providing information about the location of hazardous materials release sites. The CalEPA must update the Cortese List annually.

California Accidental Release Prevention (CCR 2745.1, 1997)

CalARP is designed to minimize the risk of extremely hazardous substances that potentially cause immediate harm to the public and the environment by requiring business owner/operator handling one or more regulated substances over the State and/or federal threshold to evaluate and determine the potential impacts of an accidental release. The CalARP mirrors the federal Risk Management Program (RMP) under the federal Clean Air Act Section 112(r), except that it includes external events and seismic analysis to the requirements and includes facilities with lower inventories of materials.

Facilities subject to the CalARP requirements must submit an RMP to the CUPA. The RMP must contain required elements, similar to those required under the federal RMP program, the specific requirements of which are determined by the CalARP "program level" that applies to the facility. For example, the RMP typically must include safety information, process hazard analysis, or hazard review, written operating procedures, training, maintenance, compliance audits, and incident investigations.

Emergency Services Act of 2009

Under the Emergency Services Act, the State developed an emergency response plan to coordinate emergency services provided by federal, State, and local agencies. Rapid response to incidents involving hazardous materials or hazardous waste is an important segment of the plan administered by the California Office of Emergency Services (CalOES), formerly the California Emergency Management Agency. CalOES is responsible for the coordination of overall State agency response to major disasters in support of local government. The office is responsible for assuring the State's readiness to respond to and recover from all hazards—natural, man-made, war-caused emergencies and disasters—and for assisting local governments in their emergency preparedness, response, recovery, and hazard mitigation efforts.

The CalOES Hazardous Materials Section coordinates statewide implementation of hazardous materials accident prevention and emergency response programs for all types of hazardous materials incidents and threats.

Releases of oil that in any way causes harm or threatens to cause harm to public health and safety, the environment, or property, require immediate notification and must be made to the CalOES Warning Center. In addition, any discharge or threatened discharge of oil into State waters must be reported to CalOES. No notification is needed if the release of oil is on land and is not discharged or threatening to discharge into State waters; does not cause harm or threaten to cause harm to the public health and safety, the environment, or property; and is under 42 gallons.

Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65; HSC Sections 25249.5 et seq.)

The Act requires businesses to notify Californians about significant amounts of chemicals that are released into the environment. It also requires the development of health-protective exposure standards for different media (air, water, land) to recommend to regulatory agencies.

CalEPA Office of Environmental Health Hazard Assessment (OEHHA) is responsible for implementing this Act. The OEHHA evaluates currently available scientific information on substances considered for placement on the Proposition 65 list. Proposition 65 is enforced by the attorney general, district attorneys, and private citizens acting in the public interest.

California Environmental Protection Agency

The CalEPA was created in 1991, which unified California's environmental authority in a single cabinet-level agency and brought the CARB, SWRCB, RWQCBs, California Department of Resources Recycling and Recovery—formerly the Integrated Waste Management Board, DTSC, OEHHA, and Department of Pesticide Regulation under one agency. These agencies were placed within the CalEPA "umbrella" for the protection of human health and the environment and to ensure the coordinated deployment of State resources. Their mission is to restore, protect, and enhance the environment, to ensure public health, environmental quality, and economic vitality.

Department of Toxic Substances Control

The DTSC is a department of CalEPA and is the primary agency in California that regulates hazardous waste, cleans up existing contamination, and looks for ways to reduce the hazardous waste produced in California. The DTSC regulates hazardous waste in California primarily under the authority of the federal RCRA and the California HSC (primarily Division 20, Chapters 6.5 through 10.6, and Title 22, Division 4.5). Other laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning.

Government Code §65962.5 (commonly referred to as the Cortese List) includes DTSC-listed hazardous waste facilities and sites, DHS lists of contaminated drinking water wells, sites listed by the SWRCB as having UST leaks and which have had a discharge of hazardous wastes or

materials into the water or groundwater and lists from local regulatory agencies of sites that have had a known migration of hazardous waste/material.

California Office of Emergency Services

In order to protect public health and safety and the environment, CalOES is responsible for establishing and managing statewide standards for business and area plans relating to the handling and release or threatened release of hazardous materials. Basic information on hazardous materials handled, used, stored, or disposed of (including location, type, quantity, and health risks) needs to be available to firefighters, public safety officers, and regulatory agencies. The information needs to be included in business plans to prevent or mitigate the damage to the health and safety of persons and the environment from the release or threatened release of these materials into the workplace and environment. These regulations are covered under Chapter 6.95 of the California HSC Article 1–Hazardous Materials Release Response and Inventory Program (Sections 25500 to 25520) and Article 2– Hazardous Materials Management (Sections 25531 to 25543.3).

CCR Title 19, Public Safety, Division 2, Office of Emergency Services, Chapter 4–Hazardous Material Release Reporting, Inventory, and Response Plans, Article 4 (Minimum Standards for Business Plans) establishes minimum statewide standards for HMBPs. These plans include the following: (1) a hazardous material inventory in accordance with Sections 2729.2 to 2729.7; (2) emergency response plans and procedures in accordance with Section 2731; and (3) training program information in accordance with Section 2732. Business plans contain basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed of in the state. Each business shall prepare an HMBP if that business uses, handles, or stores a hazardous material or an extremely hazardous material in quantities greater than or equal to the following:

- 500 pounds of a solid substance;
- 55 gallons of a liquid;
- 200 cubic feet of compressed gas;
- A hazardous compressed gas in any amount; or
- Hazardous waste in any quantity.

California Highway Patrol

A valid Hazardous Materials Transportation License, issued by the CHP, is required by the laws and regulations of State of California Vehicle Code Section 3200.5 for transportation of either:

- Hazardous materials shipments for which the display of placards is required by State regulations; or
- Hazardous materials shipments of more than 500 pounds, which would require placards if shipping greater amounts in the same manner.

Additional requirements on the transportation of explosives, inhalation hazards, and radioactive materials are enforced by the CHP under the authority of the State Vehicle Code. Transportation of explosives generally requires consistency with additional rules and regulations for routing, safe stopping distances, and inspection stops (Title 14, CCR, Chapter 6, Article 1, Sections 1150-1152.10). Inhalation hazards face similar, more restrictive rules and regulations (Title 13, CCR, Chapter 6, Article 2.5, Sections 1157-1157.8). Radioactive materials are restricted to specific safe routes for transportation of such materials.

Low Carbon Fuel Standard Protocol Section C.2.2.(f)

The CARB Carbon Capture and Sequestration Protocol Under the LCFS program (title 17, CCR, section 95480 et seq.) was established through California's AB 32 Global Warming Solutions Act of 2006. CARB designed the LCFS program by setting CI standards that increase in stringency over time for transportation fuels such as gasoline, diesel, and their substitutes used in California. A CCS Project Operator must apply for Sequestration Site Certification pursuant to subsection C.1.1.2(b) and CCS Project Certification following subsection C.1.1.2(d), which are collectively called Permanence Certification, which is required for geologic carbon sequestration projects. Application for Sequestration Site Certification requires a Site-Based Risk Assessment pursuant to subsection C.2.2, including an RMP following subsection C.2.2(c).

CCS Protocol applies to CCS projects that capture CO_2 and sequester it onshore, in either saline or depleted oil and gas reservoirs, or oil and gas reservoirs used for CO_2 EOR. The CCS Protocol applies to both new and existing CCS projects.

California Office of the State Fire Marshal

All proposed pipelines carrying hazardous materials are under the jurisdiction of the Office of the State Fire Marshal (OSFM). OSFM has the delegation of authority from the PHMSA over intrastate pipelines. The OSFM requires oversight and approval of the design, operations plan, operations safety plan, construction plans, and hydrologic testing per USDOT code 49 CFR Government Code Section 195 regulating hazardous liquids pipeline design, construction, and operation. OSFM would also review the CEQA document for spill of materials analysis and hazard impact analysis and would require monitoring of the construction of pipelines, transfer stations, and injection wells.

Note that under Part 195 - Transportation of Hazardous Liquids by Pipeline, specifically, 195.6 Unusually Sensitive Areas, the project may fall under one of these qualifying definitions.

California Public Utilities Commission General Order 95: Rules for Overhead Electric Line Construction

The CPUC's General Order 95 specifies requirements for overhead transmission line design, construction, and maintenance, including a number of requirements to avoid or minimize potential safety hazards. These requirements include standards related to vegetation management and maintenance of minimum vegetation clearances from high-voltage lines to minimize potential fire hazards.

Fire Prevention Standards for Electric Utilities

The Fire Prevention Standards for Electric Utilities (14 CCR 1250-1258) provide definitions, maps, specifications, and clearance standards for projects under the jurisdiction of PRC Sections 4292 and 4293 in SRAs.

Regulatory Programs that Have Both a Federal and State Nexus Relevant to this Project

This section synthesizes the information provided above for two topic areas that have multiple State and federal requirements, hazardous material releases and reporting, and discharges to underground injection wells.

Hazardous Materials Releases and Reporting

In California, emergency release reporting and response requirements extend across several federal statutes and numerous State laws:

- CERCLA (U.S.)
- Emergency Planning and Community Right-to-Know Act (U.S.)
- CWA (U.S.)
- RCRA (U.S.)
- The Waters Bill (House Resolution 6204)
- The Hazardous Waste Control Law (California)
- The Porter-Cologne Water Quality Protection Act (California)
- The Above-ground Petroleum Storage (California)
- The UST laws (California)
- The Occupational Carcinogens Control Act (California)

These laws differ as to what releases must be reported (for example, releases to "the environment" vs. releases to "waters of the State"), and which materials or chemicals are subject to regulations. The Waters Bill represents the minimum reporting burden for State-only releases because of the broadness of the "hazardous materials" and "release" definitions. Regulations implementing hazardous materials inventories and release reporting provisions have been adopted by the Office of Emergency Services (19 CCR §2620-2734). Kern County primarily administers these provisions.

CalARP's goal is to prevent accidental releases of substances that pose the greatest risk of immediate harm to the public and the environment. Kern County conducts inspections at CalARP facilities and reviews RMPs. Cogeneration anhydrous ammonia plants are an example of this facility type in an oilfield.

Hazardous materials handlers must report significant releases. Handlers must orally report as soon as possible without impeding control of the release and a written follow-up report must be made to the local agency and to the CalOES.

In reporting hazardous materials releases, facilities must report, at a minimum: (1) the location of the release; (2) the hazardous materials involved; (3) the quantity of material involved; (4) the potential hazards; (5) when the release occurred; and (6) the responsible party.

California regulates USTs through the California HSC. Should an unauthorized release occur, the regulations require release reporting, investigation, and abatement by the Owner. The release must be reported to the local administering agency, Kern County, and to DTSC or the California RWQCB within 24 hours of discovery. A full written report is required by the Owner within five days.

Additionally, the EPA maintains the Emergency Response Notification System database. This database is updated weekly and provides a record of all phone calls made to the NRC. The NRC is notified regarding any number of different types of spills or releases.

Discharges to Injection Wells

State and federal authorities regulate the subsurface injection of waste. The Porter-Cologne Act (see Section 4.10, *Hydrology and Water Quality*,) regulates subsurface injection discharges that could affect the quality of "waters of the State" and requires dischargers to file a Report of Waste Discharge with the local Regional Board and comply with issued WDRs.

The federal SDWA regulates underground injection to protect usable drinking water supplies from contamination. States can apply to the EPA to regulate this program within their own boundaries. For wells associated with oil and gas production (referred to as "Class II" wells), California has an EPA-approved UIC program. CalGEM administers the Class II UIC Program pursuant to a "Primacy Agreement and Memorandum of Understanding" with the EPA that was established in 1983. For classes of wells other than Class II, California does not have an EPA-approved UIC program and EPA Region IX administers the UIC program directly.

California Pipeline Safety Act of 1981 (Cal. Gov. Code § 51010)

This California Pipeline Safety Act gives regulatory jurisdiction to the State Fire Marshal for the safety of all intrastate hazardous liquid pipelines and oil interstate pipelines used for the transportation of hazardous or highly volatile liquid substances. The law establishes the federal Hazardous Liquid Pipeline Safety Act (49 U.S.C. Section 2001 et seq.) and federal pipeline safety regulations as the governing rules for intrastate pipelines. This statute also authorizes the State Fire Marshal by agreement with the United States Secretary of Transportation, to implement the federal Hazardous Liquid Pipeline Safety Act and federal pipeline safety regulations as to those portions of interstate pipelines located within the state. It also establishes the civil penalties for violations of the act or its regulations.

Health and Safety

California Occupational Safety and Health Administration

California Occupational Safety and Health Administration (Cal/OSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. Cal/OSHA standards are generally more stringent than federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident prevention programs, and hazardous substance exposure warnings.

California Occupational Safety and Health Act of 1973 –Labor Code Section 6300-6332

Cal/OSHA is responsible for developing and enforcing the workplace safety regulations in Title 8 CCR. This includes ensuring worker safety in the handling and use of chemicals in the workplace. Cal/OSHA hazardous materials regulations include requirements for safety training, availability of safety equipment, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA requires businesses to prepare Injury and Illness Prevention Plans and Chemical Hygiene Plans.

Cal/OSHA also enforces hazard communication program regulations, which contain training and information requirements, including procedures for identifying and labeling hazardous substances. The hazard communication program also requires that Material Safety Data Sheets be available to employees and that employee information and training programs be documented. Workers must be informed of the hazards associated with the materials they handle and manufacturers are required to label containers and provide worker training.

Local

Kern County General Plan

The project area is located within the KCGP area and, therefore, would be subject to applicable policies and measures of the KCGP. The Land Use, Conservation, and Open Space Element, Circulation Element, Safety Element, and Energy Element of the KCGP include goals, policies, and implementation measures related to hazards and hazardous materials that apply to the project, as described below.

Chapter 1. Land Use, Conservation, and Open Space Element.

1.3 Physical and Environmental Constraints

Goals

Goal 1. To strive to prevent loss of life, reduce personal injuries and property damage, and minimize economic and social diseconomies resulting from natural disaster by directing development to areas that are not hazardous.

Policies

Policy 1. Kern County will ensure that new developments will not be sited on land that is physically or environmentally constrained (Map Code 2.1 [Seismic Hazard], Map Code 2.2 [Landslide], Map Code 2.3 [Shallow Groundwater], Map Code 2.5 [Flood Hazard], Map Codes 2.6–2.9 and Map Code 2.10 [Nearby Waste Facility], and Map Code 2.11 [Burn Dump Hazard]) to support such development unless appropriate studies establish that such development will not result in an unmitigated significant impact.

Policy 3. Zoning and other land use controls will be used to regulate, and prohibit, if necessary, future development when physical hazards exist.

1.4 Public Facilities and Services

Goals

Goal 9. Serve the needs of industries and Kern County residents in a manner that does not degrade the water supply and the environment and protect the public health and safety by avoiding surface and subsurface nuisances resulting from the disposal of hazardous wastes, irrespective of the geographic origin of the waste.

Implementation Measures

Implementation Measure N. Secure complete and accurate information on all hazardous wastes generated, handled, stored, treated, transported, and disposed of within or through Kern County.

Implementation Measure O. Reduce to the greatest degree possible the amount of waste to be disposed of by encouraging private industry to construct and manage a high quality system of transfer stations, recycling facilities, treatment plants, and incinerators located near the generators of hazardous waste.

Implementation Measure R. Roads and highways utilized for commercial shipping of hazardous waste destined for disposal will be designated as such pursuant to Vehicle Code Sections 31303 et seq. Permit applications shall identify commercial shipping routes they propose to utilize for particular waste streams.

Chapter 2. Circulation Element

2.5.4. Transportation of Hazardous Materials

Goals

Goal 1. Reduce risk to public health from transportation of hazardous materials.

Policies

Policy 1. The commercial transportation of hazardous material, identification and designation of appropriate shipping routes will be in conformance with the adopted Kern County and Incorporated Cities Hazardous Waste Management Plan.

Policy 2. Kern County and affected cities should reduce use of County-maintained roads and city-maintained streets for transportation of hazardous materials.

Chapter 4. Safety Element

4.2. General Provisions

Goals

Goal 4. The County shall encourage extra precautions be taken for the design of significant lifeline installations, such as highways, utilities, and petrochemical pipelines.

4.6. Wildland and Urban Fire

Hazard Identification

Access and Evacuation Routes - Good planning principles, as well as existing policies and laws, dictate that all developments must be planned with circulation routes that will assure safe access for fire and other emergency equipment. The circulation routes must include secondary means of ingress and egress, consistent with topography, to meet emergency needs.

The general circulation routes are provided throughout the County by federal, State, and County-maintained road systems which are adequate for access and evacuation. State and County laws regulate the standards for new public circulation routes.

Private circulation routes that are not maintained by the State or County are subject to the standards set forth in Kern County Ordinance No. G-1832.

Clearance of Vegetative Cover for Fire Control - In 1963 the State of California enacted the Public Resources Code clearance law. This is a minimum statewide clearance law of flammable vegetative growth around structures, especially in brush- and tree-covered watershed areas. The enactment of a local ordinance is necessary where more restrictive fire safety clearance measures are desirable to meet local conditions.

Fuel Breaks and Firebreaks - Fuel breaks and/or firebreaks separating communities or clusters of structures from the native vegetation may be required. Such fuel breaks may be "greenbelts," as all vegetation need not be removed but thinned or landscaped to reduce the volume of fuel.

All fuel and firebreaks are required to meet the minimum design standards of the Kern County Fire Chief.

The Fire Department's Chief may require a fire plan for a development during the critical fire season. This plan should reflect the proposed course of action for fire prevention and suppression.

The parcel size and setback distances of buildings placed thereon should be such that adequate clearance of flammable vegetation cover may be performed within the limits of the Owner's parcel of land.

Should the Owner of a property fail to apply the required firebreak clearance, following proper notice, the County may elect to clear the firebreak vegetation and make the expense of the clearing a lien against the property upon which the work was accomplished.

Hazardous Fire Area - The Hazardous Fire Areas consists mainly of wildlands, which are mountain and hill land in an uncultivated, more or less natural state, covered with timber, wood, brush, and grasslands. This area includes some urban influence and agricultural use, such as exists around Isabella Lake and the Kern River, Woody/Glennville, Tehachapi/Cummings Valley, and Lebec/Frazier Park/Lake of the Woods.

The wildlands provide prime habitats for deer, mountain lions, bears, kit foxes, quail, chucker, wild turkeys, and condors. They also harbor fifteen identified and important rare botanic communities and vegetation associations.

The Kern County Hazardous Fire Area was established by an amendment to the Uniform Fire Code, Section 1.49H under Section 4016 of the Kern County Ordinance Code.

The boundaries of the Hazardous Fire Area are determined and publicly announced before the start of each annual "fire season" and is normally the period from April 15 to December 1 of each year, except when the Fire Chief extends this period.

The wildlands include valuable watersheds that must be preserved for receiving and passing water into surface streams and underground storage. Protection of the watersheds will prevent erosion and flood damages.

For the protection of our wildlands, we must consider all factors which will aid in fulfilling the policy stated in the California Environmental Quality Act, Public Resources Code Section 21000 et seq., to "create and maintain conditions under which man and nature can exist in productive harmony to fulfill the social and economic requirements of present and future generations."

In implementing their Fire Prevention Program, Fire Department personnel periodically inspect the areas around all buildings for accumulations of flammable material and closure of openings of vacant buildings.

Policies

Policy 1. Require discretionary projects to assess impacts on emergency services and facilities.

Policy 2. The County will encourage the promotion of public education about fire safety at home and in the workplace.

Policy 3. The County will encourage the promotion of fire prevention methods to reduce service protection costs and costs to taxpayers.

Policy 4. Ensure that new development of properties have sufficient access for emergency vehicles and for the evacuation of residents.

Policy 6. All discretionary projects shall comply with the adopted Fire Code and the requirements of the Fire Department.

Implementation Measures

Implementation Measure A. Require that all development comply with the requirements of the Kern County Fire Department or other appropriate agency regarding access, fire flows, and fire protection facilities.

4.9. Hazardous Materials

Policies

Policy 2. Innovative technologies to manage hazardous waste streams generated in Kern County will be encouraged.

Implementation Measures

Implementation Measure A. Facilities used to manufacture, store, and use of hazardous materials shall comply with the Uniform Fire Code, with requirements for siting or design to prevent on-site hazards from affecting surrounding communities in the event of inundation.

Kern County Certified Unified Program Agency

The CUPA was developed to consolidate the administration of hazardous materials programs. In the Kern County, the CUPA is the Environmental Health Services Division. The city of Bakersfield's CUPA is the Bakersfield Fire Department. Under CUPA, site inspections of above-ground storage tanks, USTs, hazardous waste treatment, hazardous waste generators, hazardous materials management and response plans, and the California Fire Code are consolidated in a single inspection. These departments also provide emergency response to hazardous materials events.

Kern County Fire Code

Kern County has adopted, by reference, portions of the California Building Standards Code and the UFC, with modifications and amendments, in Chapter 17.32 of the Kern County Code of Building Regulations (Fire Code). The purpose of this code is to prescribe the minimum requirements necessary to establish a reasonable level of fire safety to protect life and property from hazards created by fire, explosion, and dangerous conditions.

The Kern County Fire Code defines a hazardous fire area as any land that is covered with grass, grain, brush, or forest and situated (for example, in an inaccessible location) so that a fire originating upon such land would present an abnormally difficult job of suppression and would result in great and unusual damage through fire or the resulting erosion.

Kern County Multi-Hazard Mitigation Plan

The purpose of the multi-hazard mitigation plan is to reduce or eliminate the long-term risk to people and property from natural hazards and their effects in the County. The 2019-20 Update to the Plan is to help Kern County become less vulnerable to losses from future disasters. The multi-jurisdictional plan includes the County and the incorporated municipalities of Arvin, Bakersfield, California City, Delano, Maricopa, Ridgecrest, Shafter, Taft, Tehachapi, and Wasco. The County also encompasses areas of land controlled by federal and State land management agencies, including the California Department of Forestry and Fire Protection, Bureau of Land Management, and Bureau of Reclamation. While other levels of government have jurisdiction in these parts of the County, the Hazard Mitigation Plan could also be used to document and coordinate mitigation efforts among federal, State, and local jurisdictions. This plan also covers 49 special districts that include schools, airports, community service, water, recreation and parks, sanitation, and other districts.

Kern County and Incorporated Cities Hazardous Waste Management Plan

State AB 2948 (1986) authorized local governments to develop comprehensive hazardous waste management plans. The intent of each plan is to ensure that adequate treatment and disposal capacity is available to manage the hazardous wastes generated within the local government's jurisdiction. The Kern County and Incorporated Cities Hazardous Waste Management Plan (Hazardous Waste Plan) was first adopted by Kern County and each incorporated city before September 1988 and was subsequently approved by the California Department of Health Services. The Hazardous Waste Plan was updated and incorporated by reference into the KCGP in 2004 as permitted by HSC Section 25135.7(b), and thus must be consistent with all other aspects of the KCGP.

The Hazardous Waste Plan provides policy direction and action programs to address current and future hazardous waste management issues that require local responsibility and involvement in Kern County. In addition, the Hazardous Waste Plan discusses hazardous waste issues and analyzes current and future waste generation in the incorporated cities, County, State, and federal lands. The purpose of the Hazardous Waste Plan is to coordinate local implementation of a regional action to effect comprehensive hazardous waste management throughout Kern County.

The action program focuses on the development of programs to equitably site needed hazardous waste management facilities; to promote on-site source reduction, treatment, and recycling; and to provide for the collection and treatment of small quantity hazardous waste generators. An important component of the Hazardous Waste Plan is the monitoring of hazardous waste management facilities to ensure compliance with federal and state hazardous waste regulations. The siting criteria and any subsequent environmental documentation required pursuant to the CEQA would also ensure the mitigation of adverse impacts associated with the siting of any new hazardous waste facility.

Kern County Airport Land Use Compatibility Plan

The purpose of the Kern County ALUCP is to establish procedures and criteria by which the County of Kern and the affected incorporated cities can address compatibility issues when making planning decisions regarding airports and military operations areas and the land uses around them. In general, the plan describes and maps influence areas in the vicinity of public use airports in Kern County where development restrictions are established to prevent the construction or placement of structures or objects that may be an obstruction to air navigation. The plan covers airports in the unincorporated portions of the County and the affected incorporated cities of Bakersfield, California City, Delano, Shafter, Taft, Tehachapi, and Wasco. The plan was last updated in 2012. The project site is located approximately 2 miles from the Elk Hills-Buttonwillow Airport but is not within its ALUCP-defined Airport Influence Area.

Kern County Code of Ordinances Chapter 19.76 – Airport Approach Height (H) Combining District

The purpose of the Kern County Airport Height (H) Combining District is to minimize aviation hazards by regulating land uses, restricting the height of buildings and vegetation, and specifying design criteria necessary to promote aviation safety and to implement the requirements of the adopted ALUCP. The H district may be applied to areas within the vicinity of any public or general-use airport as provided for in the ALUCP. The H district design standards restrict the types of lighting, surface reflectivity, types and heights of structures, and electrical or radio interference with air navigation communications. The H district design standards also require that storage of more than 2,000 gallons of non-aviation liquid fuel at privately owned airports in the B-1 and B-2 airport land use compatibility zones be restricted to underground storage tanks. The H district further requires that except for the construction of single-family dwellings and permitted residential accessory structures on existing lots of record, no use, building, structure, plant, or tree shall be established until an application for site development plan review has been submitted to and approved by the Planning Director.

4.9.4 Impacts and Mitigation Measures

Methodology

To evaluate the potential impacts of the project with respect to the thresholds of significance outlined in the following section, each threshold of significance was evaluated at a project level.

The primary issues associated with the project that could impact public health are whether the anticipated activity would increase risks to public safety and the environment. To evaluate these risks, present practices, regulatory requirements, and accidents/spills/releases were considered.

The proposed project's potential impacts related to hazards and hazardous materials have been evaluated using a variety of resources, including the Phase I ESA, which is included as Appendix F-1, and public records and databases maintained by DTSC, SWRCB, and CalGEM.

A Public Impact Quantitative Risk Assessment, which is included in Appendix F-2, was developed to assess the potential for acute hazards to the public and the environment associated with the above-ground project facilities, including CO_2 dispersion modeling in the event of a release or rupture.

The following activities have been assessed:

- CO_2 capture and compression from existing produced gas streams and flue gas emissions from existing stationary sources;
- Transport of dense-phase CO_2 through an in-field pipeline to the North Belridge oilfield for storage. The main pipeline will be approximately 10 miles in length, with branches to the injection wells;
- Injection of dense-phase CO_2 into a depleted oil reservoir at over 8,000 feet deep for permanent geologic storage, utilizing nine injection wells; and
- Delivery of hazardous materials.

Loss of containment events from these activities may result in acute public or environmental hazards. A release of CO_2 from underground geologic storage may occur due to migration to the surface via an abandoned well, fault, or fracture. The potential for migration to the surface has also been assessed in this analysis, although this will generally result in a slow dissipated release and is unlikely to be acutely hazardous. Extensive monitoring of the injection wells; dedicated monitoring wells; and air, soil, and vegetation sampling is proposed to identify any potential failures.

Potential hazardous material impacts on the public have been quantified. The risks have been calculated by estimating the likelihood and consequences of potential release scenarios. For any given release, the number of people potentially exposed will depend on the size of the release, time of day, weather conditions, and the likelihood that the public is in the area. Total risks to the public have been summated to calculate the likelihood of exposure to a level of concern.

The project was evaluated for adequate accessibility for emergency responders based on the project location, construction plans, site plans, and any potential alterations to existing evacuation routes and plans. The methodology for determining impacts relating to wildland fires focuses on the fire severity at the project site and the surrounding areas based on existing State and local maps

and land characteristics. Using the aforementioned resources and professional judgment, impacts were analyzed according to the CEQA significance criteria described below.

Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would normally be considered to have a significant impact if it would:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 1/4 mile of an existing or proposed school;

d) Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment;

e) For a project located within the adopted Kern County ALUCP, would the project result in a safety hazard or excessive noise for people residing or working in the project area;

f) Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan;

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires;

h) Would the implementation of the project generate vectors (for example, flies, mosquitoes, and rodents) or have a component that includes agricultural waste?

Specifically, would the project exceed the following qualitative threshold:

The presence of domestic flies, mosquitoes, cockroaches, rodents, and/or any other vectors associated with the project is significant when the applicable enforcement agency determines that any of the vectors:

i. Occur as immature stages and adults in numbers considerably in excess of those found in the surrounding environment; and

ii. Are associated with design, layout, and management of project operations; and

iii. Disseminate widely from the property; and

iv. Cause detrimental effects on the public health or well-being of the majority of the surrounding population.

Based on these standards, the effects of the project have been categorized as either a “less than significant impact” or a “potentially significant impact.” Mitigation measures are recommended

for potentially significant impacts. If a potentially significant impact cannot be reduced to a less than significant level through the application of mitigation, it is categorized as a "significant unavoidable impact."

Project Impacts

Impact 4.9-1: Create a Significant Hazard to the Public or the Environment through the Routine Transport, Use, or Disposal of Hazardous Materials

Construction

All Project Components

Project construction would involve the transport, use, and disposal of hazardous materials such as fuels, lubricants, toxic solvents, and herbicides. Construction equipment generally contains limited amounts of hazardous materials such as diesel fuel, hydraulic oil, lubricants, grease, solvents, cleaners, adhesives, paints, and other petroleum-based products.

Construction activities that could be authorized under this project include, among other activities, well pad preparation; access road construction; drilling; well completion; minor pad preparation for CO_2 capture, compression, and pumping stations; as well as well stimulation activities, which are addressed separately.

The potential exists for an accidental release of hazardous materials during routine construction activities. Improper management or maintenance of hazardous materials containers, handling of hazardous materials (transfer between containers and equipment), storage, or disposal could result in leaks or larger releases which result in the contamination of soil or potentially surface water bodies, depending on the location of the release. CO_2 construction activities also have the potential to result in exposure to these hazardous materials by workers, or by the public, if access to the construction site is not adequately controlled or if the materials are not properly handled and contained.

Vehicles and equipment used for construction would contain or require the short-term use of small amounts of potentially hazardous materials including, but not limited to, fuels, lubricating oils, solvents, antifreeze, hydraulic fluid, and compressed gases. Portable generators often are used so diesel tanks could be used. Other construction activities would likely use gasoline, diesel fuel, and lubricants for fueling vehicles and paints, adhesives, and solvents for the construction of the facilities buildings. Other specialized chemicals that are potentially hazardous substances could also be used depending on the type of construction activity. These could include compressed gases; fuels, oils, and lubricants; acids; bases; demulsifiers; bactericides; and solvents. These and other products may be stored at the well pad to support the drilling process.

In general, large quantities of hazardous materials are not stored on construction sites. Materials that are used regularly are re-supplied by oilfield servicing companies. At any construction site to comply with federal and state regulations, hazardous materials should be stored in their original

containers in a designated area that is protected from the weather and that is lined and bermed to contain any leaks or spills and prevent a release to soil or waters. The Occupational Safety and Health Standards 1910 Subpart H Hazardous Materials provides guidelines by which hazardous materials should be handled and stored in the workplace. Specific requirements are provided for many different chemicals. In addition, the California Fire Code prescribes regulations that address the storage, handling, and use of hazardous substances, materials, and devices within the state. California HSC section 25504(a-c) and 22 CCR part 66265.16 require an Owner or operator to complete and submit an HMBP if the facility handles a hazardous material or mixture containing a hazardous material that has a quantity at any one time during the reporting year equal to or greater than 55 gallons of liquid; 500 pounds of a solid; 200 cubic feet at standard temperature and pressure of a compressed gas; any quantity of hazardous waste; and amounts of radioactive materials requiring an emergency plan pursuant to Parts 30, 40, or 70 of Title 10 CCR. Most applicants would have to develop HMBPs because diesel fuel is regularly stored in bulk at construction sites to fuel generators, hazardous waste is likely to be generated, and radioactive materials are used during drilling. In addition, storage of fuel or other petroleum products during construction in above-ground tanks or other containers with individual volumes greater than 55 gallons and that have a total volume of more than 1,320 gallons would be subject to the SPCC Plan requirements of 40 CFR Part 112, if waters of the United States are present. These regulations are designed, in part, to ensure that hazardous materials and oil and petroleum products are properly managed and contained to minimize the potential for a release to the environment, thereby limiting the potential for related exposure to the environment, workers, and the public.

Project construction would occur in accordance with all applicable local standards set forth by the County, as well as State and federal health and safety requirements that are intended to minimize hazardous materials risk to the public. Implementation of Mitigation Measure (MM) 4.9-1 requires a Worker Environmental Awareness Program to describe proper handling, storage, transport, and disposal techniques and methods to be used to avoid spills and minimize impacts in the event of a spill, and ensure that all handling, storage, and disposal of hazardous materials would be conducted in accordance with proven practices to minimize exposure to maintenance workers and/or the public. In addition, MM 4.9-3 would require the implementation of best practices for the avoidance, handling, and clean up of hazards and hazardous materials based on OSHA safety standards, Cal/OSHA, and the Kern County Fire Department.

Construction of the project would result in the generation of various waste materials that would require recycling and/or disposal, including some waste materials that could be classified as hazardous waste. Implementation of MM 4.9-2 would arrange for the transportation, storage, and disposal of all hazardous materials in compliance with the HMTA. Hazardous materials would be transported by a licensed hazardous waste hauler and disposed of at facilities that are permitted to accept such materials, as required by USDOT, RCRA, and State regulations. Together, federal and State agencies determine driver-training requirements, load labeling procedures, and container specifications designed to minimize the risk of accidental release. Compliance with MM 4.9-2 and existing regulations regarding the management, transport, and disposal of hazardous materials, as discussed under Section 4.9.3, *Regulatory Setting* during construction of the project would be less than significant.

Prior to construction, implementation of MM 4.9-4 would require that for all CO_2 facility pipelines, the operator shall submit for review by the County and State Fire Marshall a construction permit site plan that details the full location of the facility pipeline, width of easement for the pipeline, and specifications of pipeline appurtenances. It would also require compliance with USDOT and PHMSA regulations and require notification of any hazardous materials/waste release, other than CO_2, immediately upon discovery, and to applicable agencies. Additionally, implementation of MM 4.9-5 would require the completion of a Phase II ESA and the development of a Soil Management Plan to properly manage affected soils/wastes that are encountered during ground-disturbing activities. Furthermore, MM 4.9-9 requires written evidence of the issuance of an EPA UIC Program Construction permit and compliance with all applicable conditions and requirements of the CUP and Mitigation Monitoring and Reporting Program.

Implementation of MM 4.9-6 through MM 4.9-8 would be implemented to prevent the release or accidental spillage of hazardous waste and/or materials used during construction. These measures identify the required handling, storage, transport, and disposal techniques and methods to be used to avoid spills and minimize impacts in the event of a spill.

Because the project would result in land disturbance involving more than one acre, the management of soil and hazardous materials during construction activities would be subject to the requirements of the NPDES Construction General Permit (described in detail in Section 4.10, *Hydrology and Water Quality*), which requires preparation and implementation of a SWPPP that includes hazardous materials storage requirements. The SWPPP would list the hazardous materials (including petroleum products) proposed for use during construction; describe spill prevention measures, equipment inspections, equipment, and fuel storage; protocols for responding immediately to spills; and describe BMPs for controlling site runoff. See Section 4.10, *Hydrology and Water Quality*, of this Draft EIR for more details. In addition, MM 4.9-7 would require measures to prevent the release or accidental spillage of hazardous materials into water bodies or water sources.

Compliance with existing regulations and implementation of MM 4.9-1 through MM 4.9-9 regarding the management, transport, and disposal of hazardous materials, as above and discussed under Section 4.9.3, *Regulatory Setting*, would be mandatory. This would ensure that potential impacts related to the routine transport, use, or disposal of hazardous materials during the construction of the project would be less than significant.

Well Stimulation

WST operations are considered a construction activity under this project but are addressed separately because of the high level of public interest associated with the issue.

Hazardous materials, such as fuel and motor oil used in construction equipment, hydraulic oil and hydraulic fracturing fluid components (cross-linker, scale treatments, breaker, activator, and pH control), acids, biocides, and other well treatment chemicals would be used in downhole applications during the WST operations. Well stimulation in Kern County is used to complete wells in certain formations. Not all of the wells drilled and completed in Kern County require completion using WST operations as defined by SB 4. Well stimulation in California is regulated

by CalGEM under SB 4, WST Regulations. While the EPA has not issued any generally applicable federal regulations concerning WST activities.

Under the SB 4 WST regulations, an operator must apply for and obtain a permit to use well stimulation techniques. In the application, the operator must describe:

- The composition of the fluids to be used;
- The chemicals to be used and their concentrations;
- The disposal method of recovered water;
- The anticipated procedures to comply with the Hazardous Waste Control Law; and
- An estimate of the volume of generated waste materials and how they will be disposed of.

Further, all applicants applying to conduct a defined well stimulation operation would be required to store and manage hydraulic fracturing fluids in compliance with all applicable requirements of the RWQCB, the DTSC, CARB, the Air Pollution Control District, the CUPA, and any other State or local agencies with jurisdiction over the location of the well stimulation activities. In addition, the Owner/operator would be required to adhere to Storage and Handling of WST Fluids and Wastes regulations that require that fluids be stored with secondary containment, with certain exceptions. The Owner/operator must have a Spill Contingency Plan that accounts for all production facilities outside of secondary containment and includes specific steps to be taken and equipment available to address a spill outside of secondary containment. In addition, the Owner/operator would have to comply with testing, inspection, and maintenance requirements for production facilities containing WST fluids. All fluids must be accounted for in the operator's Spill Contingency Plan, cannot be stored in containers, and shall not be stored in sumps or pits. If an unauthorized release occurs, the Owner/operator must immediately implement its Spill Contingency Plan; notify the appropriate response entities of the location and the type of fluids involved, as required by all applicable federal, State, and local laws and regulations; and perform clean up and remediation of the area, and dispose of any cleanup or remediation waste, as required by all applicable federal, State, and local laws and regulations. In addition, the Owner/operator would have to report the release within five days.

During well stimulation procedures, applicants would have to continuously monitor and record specific parameters. Operators must terminate stimulation and immediately report to CalGEM if certain critical pressure thresholds are reached or if there is a potential breach of the well casing. If an unauthorized release occurs, the operator must implement its Spill Contingency Plan, notify the appropriate authorities, clean up or remediate, and report to CalGEM.

Unauthorized releases have occurred and would likely continue to occur during well stimulation activities. The potential effect of the release would depend on its size, its location in the well bore, and the proximity to either aquifers or surface-sensitive receptors; therefore, the potential impacts could be significant.

Operations

Operation of the project would involve the routine storage and use of hazardous materials for operations and routine maintenance. At full build-out, the operational aspects and maintenance activities of the project would require a total of up to 10 personnel daily on the project site. In general, impacts during normal operations of the project would be limited to personnel directly involved in project operations and maintenance.

As described in Appendix F-2 (Public Impact Quantitative Risk Assessment) of this EIR, the project was assessed for the potential for acute hazards to the public and the environment associated with the above-ground project facilities. Potential hazards to the public associated with acute exposure to hazardous materials have been assessed by calculating both the risk to individuals and the risk to society as a whole. The full range of potential for acute hazards to the public and the environment are discussed in detail in Appendix F-2 and are summarized below. Potential health risks associated with CO_2 exposure are described in Section 4.3, *Air Quality*.

Carbon Capture and Compression

A large release of CO_2 at a carbon capture and compression facility may impact oil production areas adjacent to the facility. A release of liquefied CO_2 will have the greatest hazard distances of 1,200 feet to a 1 percent CO_2 concentration under low wind conditions at night. The carbon capture and compression facility at Steam Generator 2868 is approximately 1,500 feet from SR 33, which is the closest capture facility to public populations.

The CO_2 capture facilities would utilize a traditional amine absorption process. Amines are classified as hazardous under the criteria of the federal OSHA Hazard Communication Standard 29 CFR 1910.1200. Amines are harmful if swallowed and could cause severe skin burns and eye damage. Capturing CO_2 from existing stationary sources would utilize hazardous chemicals typical of an oil production and power generation facility. These chemicals include diluted amine, concentrated amine, caustic, sulfuric acid, calcium chloride, triethylene glycol, corrosion inhibitors, scale inhibitors, brominated biocide, sodium hypochlorite, and citric acid. Each of these chemicals is classified as hazardous under the criteria of the federal OSHA Hazard Communication Standard 29 CFR 1910.1200. Many of these chemicals are harmful if swallowed and could cause skin and eye damage.

As a result of these operations, the project would generate potentially hazardous waste. The Owner/applicant would determine the toxicity and physical properties of the waste streams generated to determine the proper waste classification and disposal methods in compliance with applicable regulations including California HSC and CCR. The Owner/applicant would add all waste material to the required California Environmental Reporting System State database along with the required Site Maps and Consolidated Contingency and Emergency Response Plans. The CO_2 capture process would generally generate results in three types of hazardous waste material: degraded amine, carbon filtration media; and amine filter cartridges.

The use and storage of hazardous materials is regulated by applicable federal, State, and local regulations. Compliance with these requirements would serve to minimize health and safety risks

to people or structures associated with routine use, transport, and disposal as well as accidental release of or exposure to hazardous materials. Implementation of MM 4.9-1 through MM 4.9-3, MM 4.9-7, and MM 4.9-8 would be implemented to prevent the release or accidental spillage of hazardous waste and/or materials used during operations.

Produced Gas Transfer Pipeline

A release from the produced gas transfer pipeline may result in toxic hazards due to both CO_2 and H_2S dispersion. Hazards associated with CO_2 are greater than H_2S in proximity to the pipeline. As the cloud disperses, concentrations of H_2S are more of a concern, which has the potential to impact the public on SR 33.

No public areas would be impacted by a worst-case release at a level that could cause significant injury or fatality. A worst-case release may impact the public on SR 33 and some areas to the east of SR 33 at an H_2S concentration of 0.5 to 5 ppm. A worst-case event may cause some discomfort due to an unpleasant odor, which will be a brief exposure for personnel driving along the highway.

CO_2 Pipeline Transfer to Storage Sites

The proposed CO_2 pipeline route runs parallel to SR 33, about 2,000 to 3,000 feet distance from the road in the closest areas. In the event of a large release, the cold dense cloud will initially spread laterally, then disperse downwind. With a southwesterly wind (blowing towards the northeast), the cloud may drift over the highway and into agricultural areas to the east of the highway. The concentration at the highway may be in the range of 1 percent to 2 percent CO_2, with some areas up to 3 percent CO_2. The maximum extent of the cloud will reduce within the first 10 minutes as the initial high CO_2 release rate from the pipeline rapidly decays.

Wonderful Nut Farms operates a solar panel area to the west of SR 33, in proximity to the proposed pipeline. Public personnel working in the area may be exposed to a concentration of CO_2 greater than 4 percent, which may result in fatalities. If the wind is directed towards the solar panel area during the day, concentrations may exceed 7 percent up to 1,200 feet from the release, with a crosswind width of 1,400 feet.

Oil field production workers in areas operated by Berry Petroleum and Team Operating may be exposed to CO_2 in the event of a large pipeline failure. Berry Petroleum, in Section 19 of South Belridge, may be exposed to a level of concern between 1 percent and 3 percent CO_2 if a failure occurs in the vicinity and the wind is blowing from the east or northeast. Workers within the Team Operating Area in North Belridge may be exposed to a concentration of 1 percent to 10 percent CO_2, if a distribution pipeline failure occurs in the vicinity and the wind is directed towards the Team Operating area.

CO_2 Storage Injection Wells

A major well blowout during calm weather conditions may result in a hazardous CO_2 cloud drifting toward the oil field production area operated by Team Operating. A release at the two closest CO_2 injection wells during adverse weather conditions is highly unlikely to impact neighboring workers, and the risk has been estimated at 1 in 69 million years.

Leakage of CO_2 from Storage Reservoir

A leakage of CO_2 from the storage reservoir to the surface may occur via a wellbore or through the confining caprock. The leak rate is likely to be low and the release will dissipate quickly. No public personnel will be in the immediate vicinity of the storage field.

Amine Truck Transportation

The hazards associated with an ethanol amine release may occur in the immediate vicinity due to contact or inhalation of a liquid spray or mist. During truck transit on the highway, a vehicle collision or equipment failure may result in a release that has the potential to impact the public or response personnel with corrosive liquid. There is no public access to hazardous material unloading and storage areas, and therefore there is no potential for public exposure associated with these operations.

Sulfuric Acid Truck Transportation

The hazards associated with a sulfuric acid release may occur in the immediate vicinity due to contact or inhalation of a liquid spray or mist. Concentrated sulfuric acid is highly corrosive and can cause severe chemical burns on contact with the skin or eyes. During truck transit on the highway, a vehicle collision or equipment failure may result in a release that has the potential to impact public or response personnel. There is no public access to hazardous material unloading and storage areas, and therefore there is no potential for public exposure associated with these operations.

Injection or Monitoring Well Failure

CO_2 leakage could occur from failure of an injection or monitoring well during operation. CO_2 migration could occur along an injection or monitoring well, or both, due to poor or subsequently degraded facility pipelines. Integrity loss at the injection or monitoring, or both, well may endanger shallow groundwater. Two existing groundwater wells would supply water to the project; however, they are located in the Buena Vista Water Storage District outside of the project area. Two USDWs were identified, with most of the area either dry or the water contains solid concentrations exceeding acceptable USDW limits (see Section 4.10, *Hydrology and Water Quality*). Implementation of MM 4.9-10 would require compliance with all requirements of the EPA-issued UIC CCS Program permit and EPA, conditions of the approved Conditional Use Permit, and requirements of the adopted Mitigation Measure and Reporting Program.

Drilling a new well into or through a CO_2 injection zone could create a potential risk of release of CO_2 from the subsurface resulting in risks to human health and the environment. In the case of emergencies or releases, implementation of MM 4.9-12 requires that information shall be communicated immediately upon discovery to the Kern County Fire Marshall and Public Health with reports to the Kern County Planning and Natural Resources Department within 24 hours.

Equipment Failure

Maintaining dense-phase CO_2 within design specifications will be more challenging than with natural gas. There may be additional stresses on the pipeline due to rapid changes in temperature

due to a leak or equipment failure. There is the possibility of brittle failure due to rapid cooling, and ice formation during depressurization. Damage to or failure of pipelines and surface equipment can result in CO_2 leakage or sulfuric acid release. There is a possibility of fugitive emissions from surface equipment in the event of equipment failure. Seals and valves will also need to be specifically selected for CO_2 service. This may increase the likelihood of failure due to equipment. As discussed above, there is no pathway for drinking water contamination (see Section 4.10, *Hydrology and Water Quality*).

Overall, the failure rate for an above-ground CO_2 pipeline on non-public property is likely to be lower than an equivalent-sized below-ground gas transmission line. However, due to the uncertainty in potential material failures, equipment and operations, and limited historical data for CO_2 pipelines, it has been conservatively assumed that failure rates for the project CO_2 pipelines are equivalent to natural gas pipelines. Modification factors have been applied for the above-ground produced gas transfer line from Del Sur Compressor Station to Sulferox (SOX) Plant 32 for the likely reduction in external corrosion and reduction in the potential for external impact. In addition, minor CO_2 fugitive emissions do not pose an acute risk to human health or the environment.

Natural Disaster

The project is located in the San Joaquin Valley. The climate in the region is characterized as having a hot, dry climate, and on average, the valley floor receives approximately eight inches of precipitation per year. Although not common, potential desert natural disasters include earthquakes and flash floods.

Well problems (integrity loss, leakage, or malfunction) may arise as a result of a natural disaster (for example, earthquake or flooding) affecting the normal operation of the injection well.

Earthquakes: As discussed in Section 4.7, *Geology and Soils*, there are numerous earthquake faults in the vicinity of the project area. However, implementation of MM 4.7-1 would require the Owner/operator to prepare a comprehensive seismic activity monitoring plan. See Section 4.7, *Geology and Soils*, of this EIR for further discussion of potential impacts from CO_2 leakage from an induced seismic event.

Flooding: As discussed in Section 4.10, *Hydrology and Water Quality*, the project is located in three FIRM areas (FIRMs 06029C1175E, 06029C1675E, and 06029C1700E). FEMA has designated the central and southern portions of the project site as Zone A, which is identified as areas with a 1 percent annual chance of flooding. All other portions of the project site are located in an area designated by the FEMA as Zone X, which is identified as areas that experience minimal flooding, and are outside of the 0.2 percent annual chance floodplain.

Fluid Leakage to Shallow Groundwater

CO_2 leakage out of the project site could result in CO_2 leakage into shallow groundwater. However, as discussed above, there are no records of water supply wells within the project site. Two potential USDWs were identified, with most of the area either dry or the water contains solid

concentrations exceeding acceptable USDW limits. The lowermost potential USDW, is separated from the proposed injection zone by more than 7,000 feet of strata, including many confining zones. Therefore, the injection of CO_2 associated with the development of the proposed storage complex is not expected to impact the groundwater quality of potential USDWs. As discussed in Section 4.10, *Hydrology and Water Quality*, implementation of MM 4.10-4 and MM 4.10-5, the UIC program would prevent discharge into any underground source of current or future beneficial use groundwater. Injection of CO_2 into the ground via injection well would not mix with or contaminate groundwater.

See Section 4.10, *Hydrology and Water Quality*, of this EIR for further discussion of potential impacts from CO_2 leakage to shallow groundwater.

Induced Seismic Event

The project site is located in California's seismically active San Joaquin Valley region where there are a number of active faults with the potential to produce strong ground motion. Given the proximity of the project site to overall seismic activity in the region, project structures may be subject to strong ground shaking, which may result in CO_2 leakage. As described in Section 4.7, *Geology and Soils*, impacts from seismic hazards are considered potentially significant without mitigation. Implementation of MM 4.7-1 would be required to reduce these potential impacts to a less than significant level.

See Section 4.7, *Geology and Soils*, of this EIR for further discussion of potential impacts from CO_2 leakage from an induced seismic event.

Other Operational Activities

Other ancillary operational activities that could occur with this project include waste management; control of vegetation; maintenance and testing of wells, pipeline, tanks, and vessels; and maintenance of access roads.

In Kern County, the Kern County Environmental Health Services Division implements the Unified Program for businesses to comply with the following requirements:

- Hazardous Material Response Plans and Inventory Program;
- UFC Plans and Inventory requirements;
- Hazardous Waste Generator and On-site Hazardous Waste Treatment Programs;
- CalARP Program;
- UST Program; and
- Above-ground Petroleum Storage Tank SPCC Plan.

These forms provide the County with information about the hazardous materials, regulated substances, storage tanks, and hazardous waste generated at a facility. This hazardous material inventory requires a description of all hazardous materials that would be stored on site, how much

is stored on a daily basis, and the type of storage container. In addition, the amount and type of hazardous waste generated, how it is stored, and how it is disposed of must be provided as well. Businesses also must provide a Consolidated Contingency Plan which must be implemented whenever there is a fire, explosion, or release of hazardous material or waste that could threaten public health or the environment. The plan must detail the business' standard operating procedures for addressing potential releases including prevention measures and how a spill would be stopped and cleaned up. Included must be a list of available emergency equipment and the training that personnel must receive. Also included are site maps to identify where hazardous materials and wastes are stored and where emergency response equipment is located as well as emergency evacuation routes.

Adherence to the regulations and requirements described in the preceding paragraphs would limit the potential for exposure from routine use of hazardous materials during operations such that unhealthful levels of exposure by workers at a work site, or to the general public located outside of project work areas, would not be expected. Furthermore, adherence to these regulations and requirements would limit the potential for hazardous material to be released into the environment due to routine use. In general, adherence to these requirements would result in routine use related to project operations having a low likelihood of health or environmental consequences from exposure to a hazard by the public off site or to construction workers on site.

Other Wastes

The project would result in non-RCRA drilling wastes, including drilling muds, drill cuttings, wash water, and other related waste that would be generated per well drilled in Kern County. The actual amount would depend on the depth of the well.

In the 2015 Oil and Gas Draft PEIR, Section 3.5.3, Construction Activities in Detail, the different solid wastes generated during oil and gas field activities are described, as is how such nonhazardous solid wastes are disposed of on or off site. Methods used include injection wells, on-site burial in pits and landfills, land treatment, evaporation, surface discharge, and recycling. All disposal methods would have to comply with local, State, and federal regulations.

Summary

Regulations governing the transportation of hazardous materials via trucks and pipelines are comprehensive and serve to prevent or mitigate the release of hazardous materials in many situations. Nevertheless, potential releases have the potential to contaminate the environment or expose the public to hazardous materials that could result in health impacts to project personnel and the public if CO_2 were to leak into the atmosphere (see also Section 4.3, *Air Quality*). Therefore, these impacts could be significant.

The use, handling, and storage of hazardous materials is also regulated. Despite the implementation of federal and state regulations (such as under RCRA and California Hazardous Waste Laws), releases or spills have the potential to occur with the implementation of the project. Since these potential releases could contaminate the environment or expose the public to hazardous materials, the impacts could be significant.

With the implementation of MM 4.9-1 through MM 4.9-12, project construction and operation would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, and impacts would be less than significant.

Mitigation Measures

Implement MM 4.7-1 (see Section 4.7, *Geology and Soils*), MM 4.10-4 and MM 4.10-5 (see Section 4.10, *Hydrology and Water Quality*), and

MM 4.9-1 The owner/operator shall provide a comprehensive Worker Environmental Awareness Program to Kern County with its first carbon capture and storage (CCS) project-related permit application in each calendar year. The program shall include all training requirements identified in owner/operator Best Management Practices and mitigation measures and include training for all field personnel (including owner/operator employees, agents, and contractors). The Worker Environmental Awareness Program shall include protocols and training for responding to and handling of hazardous materials and hazardous waste management, and emergency preparedness, release reporting, and response requirements. The Worker Environmental Awareness Program shall be provided to the surface owner at the time of the application pathway process so the surface owner may educate employees as well.

MM 4.9-2 The owner/operator shall arrange for transportation, storage, and disposal of all hazardous materials in compliance with the Hazardous Materials Transportation Act. Drivers transporting hazardous materials or wastes should follow the measures recommended by the Federal Motor Carrier Safety Administration for avoiding roll-over accidents which include the following standards for cargo tank trucks:

a. Avoid sudden movements that may lead to roll-overs.

b. Maintain control of the load in turns and on straight roadways.

c. Identify in advance of transport high risk areas on designated roads.

d. Follow driver mandates for being alert and attentive behind the wheel.

e. Control speed and maintain proper "speed cushions" described by the Federal Motor Carrier Safety Administration.

MM 4.9-3 The owner/operator shall implement the following practices based on practices and standards established by the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) safety standards and as amended or modified by the State of California Department of Industrial Relations, Division of Occupational Safety and Health (DOSH – Cal/OSHA) and the Kern County Fire Department.

a. Construction activities shall be conducted to allow for easy clean up of spills. Construction crews shall have the appropriate number of tools, supplies, and absorbent and barrier materials to contain and recover spilled materials.

b. Fuels and lubricants shall be stored only at designated staging areas. Fuel and lubricant tanks shall have secondary spill containment (e.g., curbs). Compliance with laws and regulations is required, including compliance with hazardous materials and hazardous waste storage laws, as applicable.

c. Storage of fuel and lubricants in the staging area shall be at least 100 feet away from the edge of water bodies. Refueling and lubrication of equipment shall be restricted to upland areas at least 100 feet away from stream channels and wetlands.

d. Any fuel truck shall carry an oil spill response kit and spill response equipment at all times.

e. Owner/operator shall be required to perform all routine equipment maintenance at the well pad or other suitable locations (i.e., maintenance yards), and promptly collect and lawfully dispose of wastes in compliance with existing regulatory requirements.

f. Berms and/or dikes (secondary containment) shall be constructed around the permanent above-ground bulk tanks and the foundations shall be installed with a passive leak detection system, so that potential spill materials shall be contained and collected in specified areas isolated from any water bodies. Tanks shall not be placed in areas subject to periodic flooding or washout. Compliance with laws and regulations is required, including compliance with hazardous materials and hazardous waste storage laws as applicable, including for secondary containment, such as Geologic Energy Management Division regulation (Title 14, C.C.R. § 1773.1), which requires secondary containment in "an engineered impoundment such as a catch basin, which can include natural topographic features, that is designed to capture fluid released from a production facility."

g. The appropriate amount and supply of sorbent and barrier materials shall be maintained on construction sites consistent with the type and level of construction activities. Sorbent and barrier materials shall also be utilized to contain runoff from contaminated areas consistent with Cal/OSHA regulations.

h. Shovels and drums shall be stored at each well pad or be readily available. If small quantities of soil become contaminated, hand

tools shall be used to collect the soil and the material shall be stored in storage drums. Large quantities of contaminated soil may be bio-remediated on-site or at a designated remediation facility, subject to government approval, or collected utilizing heavy equipment, and stored in drums or other suitable containers prior to disposal. Should contamination occur adjacent to staging areas as a result of runoff, shovels and/or heavy equipment shall be utilized to collect the contaminated material. Contaminated soil shall be disposed of in accordance with State and federal regulations.

i. Above-ground tanks, valves and other equipment shall be visually inspected monthly and when the tank is refilled. Inspection records shall be maintained. Owner/operator s shall periodically check tanks for leaks or spills.

j. Drain valves on all tanks shall be locked to prevent accidental or unauthorized discharges from the tank.

k. Equipment maintenance shall be conducted in staging areas or other suitable locations (i.e., maintenance shops or yards).

l. The owner/operator shall maintain equipment in operating condition to reduce the likelihood of fuel or oil line breaks and leakage. Any vehicles with chronic or continuous leaks shall be removed from the site and repaired before being returned to operation.

MM 4.9-4 All CCS related CO_2 facility pipelines shall require construction permit site plan review by the Kern County Planning and Natural Resources Department. With the exception of minor deviations of up to 10 feet on either side, the pipeline shall be constructed in the location shown in the construction permit site plan.

The site plan shall include the full location of the facility pipeline, width of easement for the pipeline, location and spacing of automatic shut off values, location of infra-red cameras for monitoring, construction and coatings used for the pipeline and all other requirements of federal and State regulations. Safety fencing shall be provided at specific locations along the pipeline to protect critical components such as valves, controls, and safety devices. General reference to "compliance with regulations" will not be considered sufficient. The site plan package shall concurrently be submitted to the Kern County Planning and Natural Resources Department, Kern County Fire Marshall and California State Fire Marshall for review and approval.

The plan shall include all details and features to show compliance with 49 CFR Part 195. The U.S. Department of Transportation (U.S. DOT) and the Pipeline and Hazardous Materials Safety Administration (PHMSA) has delegated CO_2

pipeline oversight to the State Fire Marshall, who will evaluate pipelines for compliance with PHMSA. All costs for review by all parties shall be borne by the owner/operator.

The owner/operator shall notify the Kern County Public Health Services Environmental Health Division, the Certified Unified Program Agency (CUPA), surface landowner, and sensitive receptors located within 300 feet, of any hazardous materials/waste release, other than CO_2, immediately upon discovery, and to other applicable agencies as required by other laws. The owner/operator shall immediately contain the leak (e.g., by isolating or shutting down the leaking equipment), clean up contaminated media (e.g., soils), and repair the leak prior to recommencing operations. The owner/operator shall report the status and progress of the leak repair and remediation work to the County and the CUPA on monthly intervals or predetermined intervals until the repair has been completed. Contaminated media shall be analyzed according to 22 C.C.R. §§ 66261.21-66261.24 for determination of hazardous waste disposal subject to the Hazardous Waste Determination procedures provided in 22 C.C.R. §66262.11.

MM 4.9-5 Prior to initiation of ground disturbing activities, the owner/operator shall complete Phase II Environmental Site Assessment activities within areas of ground disturbance. Develop a Soil Management Plan for implementation during Project construction activities to properly manage affected soils/wastes that are encountered during ground disturbing activities.

MM 4.9-6 If, during grading or excavation work, the owner/operator observes evidence of contamination or if soil contamination is suspected, work near the excavation site shall be terminated, the work area cordoned off and required health and safety procedures implemented for the location by the contractor's Health and Safety Officer. Samples shall be collected by a trained and qualified individual. Analytical data from suspected contaminated material shall be reviewed by the contractor's Health and Safety Officer. If the sample testing determines that contamination is not present, work may proceed at the site; however, if contamination is detected above regulatory limits, the Kern County Public Health Services Department shall be notified. All actions related to encountering unanticipated hazardous materials at the site shall be documented and submitted to the Kern County Public Health Services Department for legal direction from the regulatory agency.

MM 4.9-7 The owner/operator shall implement measures to prevent the release or accidental spillage of solid waste, garbage, construction debris, sanitary waste, industrial waste, naturally occurring radioactive materials, oil and other petroleum products, and other wastes into water bodies or water sources, including all applicable practices listed below. Other standards may also be utilized, provided that a professional engineer, certified industrial hygienist or certified safety professional certifies to Kern County that such standards are as or more protective of human

health and the environment, as compared to the standards in the referenced U.S. Environmental Protection Agency (EPA) Onsite Wastewater Treatment Systems Manual (manual). The following are practices and standards that shall be implemented.

a. Classify the various wastes for disposal as described in the EPA manual, and in accordance with applicable California laws and regulations.

b. Size reserve pits to avoid overflows.

c. Use closed loop mud systems with oil-based muds except in compliance with State Water Resources Board or Regional Water Quality Control Board requirements as provided in Mitigation Measure 4.9-3.

d. Review safety data sheets of materials used and use the less toxic material for the operation.

e. Design systems with the smallest volumes possible (e.g., drilling mud systems).

f. Reduce the amount of excess fluids entering reserve and production pits.

g. Keep non-exempt wastes out of reserve or production pits.

h. Design the drilling pad to contain stormwater and rigwash.

i. Recycle and reuse oil-based muds and high-density brines when such recycling and reuse complies with hazardous waste laws and recycling laws.

j. Perform routine equipment inspections and maintenance to prevent leaks or emissions.

k. Reclaim oily debris and tank bottoms when such reclamation complies with hazardous waste laws and recycling laws.

l. Store only the volume of materials at facilities necessary for permitted work.

m. Construct berms around materials and waste storage areas that meet engineering standards to contain spills.

n. Perform routine inspections of materials and waste storage areas to locate damaged or leaking containers.

o. Train personnel in all waste management practices required by the mitigation measures, all legal standards and the permits issued by Kern County, CalGEM and all regulatory agencies.

MM 4.9-8 The following specific measures should be implemented at a minimum when conducting CCS development activities, as applicable:

a. Impervious secondary containment, such as containment dikes, containment walls, and drip pans shall be constructed and maintained around all qualifying petroleum facilities, including tank batteries and separation, and treating areas consistent with the Environmental Protection Agency's Spill Prevention, Control, and Countermeasures regulation (40 Code of Federal Regulations 112). The containment structure must have sufficient volume to contain, at a minimum, the content of the largest storage tank containing liquid hydrocarbons within the facility/battery and engineered freeboard to contain precipitation. Drip pans shall be routinely checked and cleaned of petroleum or chemical discharges and designed to prevent access by wildlife and livestock.as determined by the qualified biologist.

b. Chemical containers shall not be stored on bare ground and shall be maintained in good condition and shall be placed within secondary containment in case of a spill or high velocity puncture.

c. Containment dikes are not to be constructed with topsoil or coarse, insufficiently impervious spoil material that is insufficiently impervious to meet requirements. Containment is strongly suggested for produced water tanks. Chemicals shall be placed within secondary containment and stored so that the containers are not in contact with soil or standing water and product and hazard labels are not exposed to weathering.

d. Maintain a clean well location. Remove trash, junk, and other materials not in current use.

MM. 4.9-9 Prior to commencement of any construction or grading, the owner/operator is required to provide written evidence of all of the following requirements:

1. Issuance of an EPA UIC Program Construction permit
2. Compliance with all applicable conditions of the approved Conditional Use Permit
3. Compliance with all applicable requirements of the adopted Mitigation Measure and Reporting Program.

MM 4.9-10 Prior to commencement of any testing or full operation to inject CO_2, the owner/operator is required to provide written evidence of all of the following requirements:

1. Written correspondence from the Environmental Protection Agency (Region 9) UIC program to the Kern County Planning and Natural Resources Department that the owner/operator has fully complied with all requirements of the EPA-issued UIC CCS Program permit and EPA is authorizing commencement of injection, for testing or commencement of injection for full operations.
2. Compliance with all applicable conditions of the approved Conditional Use Permit
3. Compliance with all applicable requirements of the adopted Mitigation Measure and Reporting Program.

MM 4.9-11 All sources that provide CO_2 for injection to the CarbonFrontier (Kern County) project must have been disclosed to the Kern County Planning and Natural Resources Department and EPA in writing and be legally permitted to operate by the county or city where they are located.

MM 4.9-12 No confidential information or sources may be used in the operation of this facility. All information provided to the federal government or State of California regarding construction or operation of the facility or incidents at the facility shall be reported concurrently to the Kern County Planning and Natural Resources Department. In the case of emergencies or releases, the information shall be communicated immediately upon discovery to the Kern County Fire Marshall and Public Health with reports to the Kern County Planning and Natural Resources Department within 24 hours after

Level of Significance After Mitigation

Impacts would be less than significant.

Impact 4.9-2: Create a Significant Hazard to the Public or the Environment through Reasonably Foreseeable Upset and Accident Conditions Involving the Release of Hazardous Materials into the Environment

The public and/or the environment could be affected by the release of hazardous materials from accidents or improper handling or disposal of fuels or other hazardous materials. Spills, release, overflow of tanks, or breach of containment can occur from operator error or limited storage capacity; water ingress from stormwater or floods; poor construction or failure of tanks and/or liners, or pipeline failure. A spill or release could expose workers and the public to levels of hazardous materials in excess of applicable regulations.

As discussed above under Impact 4.9-1, all operators are required to maintain hazardous materials in staging or storage areas in proper storage containers and with sufficient secondary containment

in accordance with federal and state regulations. Facility pipelines must be operated according to PHMSA regulations.

Construction

As discussed in Impact 4.9-1 above, an accidental release of hazardous materials (e.g., oils, fuels, paints) during construction of the project could result in the exposure of construction workers, the public, and/or the environment to hazardous materials. However, compliance with existing regulations regarding the management, transport, and disposal of hazardous materials, as discussed under Section 4.9.3, *Regulatory Setting*, and MM 4.9-1 through MM 4.9-3, would be implemented to avoid the potential for accidental spills, leaks, and/or improper disposal of hazardous materials during construction of the project. Additionally, MM 4.9-14 would be implemented to ensure safe drilling and drill casing practices, well design, and construction.

As discussed above, construction projects that disturb one acre or more of land would be subject to the requirements of the NPDES Construction General Permit, which requires preparation and implementation of a SWPPP to reduce the risk of spills or leaks that might reach the environment, including procedures to address minor spills of hazardous materials. Measures to control spills, leakage, and dumping must be addressed through structural as well as nonstructural BMPs. BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In addition, MM 4.9-7 would require measures to prevent the release or accidental spillage of hazardous materials into water bodies or water sources. Although less frequent, project-related ground disturbance could encounter contaminated soil, sediment, or groundwater that would expose workers, the public, or the environment to hazards if adequate precautions are not taken (see Impact 4.9-4 for further discussion of potential impacts).

The disturbance of contaminated soil, if encountered during construction activities could result in impacts on public and/or the environment because soil containing hazardous materials could be released into the environment, and the movement of contaminated soil could spread contamination to new areas. Therefore, the potential release of subsurface hazardous materials into the environment during construction of the project is a significant impact. However, implementation of MM 4.9-5 and MM 4.9-6 would be implemented to reduce impacts. Furthermore, MM 4.9-15 would be implemented, which requires the notification of any project-related contamination within 24 hours of the discovery to the Kern County Public Health Environmental Health Division, Kern County Planning and Natural Resources Department and all State and federal implementing regulatory agencies.

As previously discussed in Section 4.9.2, *Environmental Setting*, the Phase I ESA identified RECs on and in proximity to the project site including: past and current petroleum hydrocarbon extraction activities: area of land to the west of the project site was used as a Class III landfill; historic worker residences containing ACM and LBP; a historical waste disposal site located in the South Belridge oilfield east of the Oasis office building, and the 41 on-site wastewater pits.

Because the current and historical use of the project site and surrounding land includes petroleum hydrocarbon extraction activities, there is a potential that oil production-related chemicals, such as diluted amine, concentrated amine, caustic, sulfuric acid, calcium chloride, triethylene glycol, corrosion inhibitors, scale inhibitors, brominated biocide, sodium hypochlorite, and citric acid, may have been used and stored on site. There are also thousands of plugged wells and hundreds of active, idle, and canceled wells located in the project site and surrounding area. The Phase I ESA concluded releases of petroleum hydrocarbons have occurred on or close to the project site.

To address these conditions and the potential for upset, the Phase I ESA recommended development of a Soil Management Plan for implementation during project construction activities to properly manage affected soils/wastes in the event that they are encountered during ground-disturbing activities. Additionally, the Phase I ESA recommended to complete Phase II ESA activities within selected areas of potential environmental concern within the project area that may be affected by the proposed project, such as historical drilling/production sump locations, and the closed Class III solid waste landfill, and a suspect waste disposal area. Implementation of these recommendations, as detailed in MM 4.9-5 would ensure that the risk of a release of hazardous materials into the environment during construction is less than significant.

As discussed above, all operators are required to maintain hazardous materials in staging or storage areas in proper storage containers and with sufficient secondary containment in accordance with federal and state regulations.

Operation

Project operations would consist of limited hazardous materials on the site (see Table 4.9-2, for a complete list of hazardous materials). As discussed in Impact 4.9-1 above, any routine transport, use, and disposal of these materials during project operations must adhere to federal, State, and local regulations for transport, handling, storage, and disposal of hazardous substances. In addition, implementation of MM 4.9-13 requires the preparation of a Hazardous Materials Business Plan that would require annual worker training requirements. Furthermore, hazardous materials/chemicals (for example, herbicides for vegetation management) in low quantities do not pose a significant threat related to the release of hazardous materials into the environment.

As discussed in Impact 4.9-1 above, impacts during normal operations of the project would be limited to personnel directly involved in project operations and maintenance. Impacts on personnel, the public, and the environment from CO_2 leakage could occur during capture, transport, or storage.

As described in Appendix F-2, Quantitative Risk Assessment, of this EIR, potential hazards to the public associated with acute exposure to hazardous materials have been assessed by calculating both the risk to individuals, and the risk to society as a whole. The risks have been determined by combining the potential severity and likelihood for three selected levels of concern. The levels range from minor injury to potential fatality.

Overall, adherence to regulations and standard protocols during the storage, transportation, and usage of any hazardous materials, and implementation of MM 4.9-1 through 4.9-3, MM 4.9-5

through MM 4.9-7, and MM 4.9-13 through MM 4.9-15 would minimize or reduce potential impacts related to reasonably foreseeable upset and accident conditions involving the release of hazardous materials, to less than significant.

Mitigation Measures

Implement MM 4.9-1 through 4.9-3 and MM 4.9-5 through MM 4.9-7**,** as described above**,** and

MM 4.9-13 As part of the Hazardous Materials Business Plan and the spill prevention, control, and Countermeasures Plan, the owner/operator shall require annual worker training requirements to: increase awareness of the most common types of failures and methods to avoid mistakes, shall maintain records of employee training, and shall make such records available to the County for review upon request.

MM 4.9-14 The owner/operator shall comply with the California Geologic Energy Management Division requirements for assuring safe drilling and drill casing practices, well design, construction and well management requirements, blowout requirements, and all other provisions of 14 California Code of Regulations 1744 and other applicable Geologic Energy Management Division regulations to any wells being abandoned as a result of the CCS project. The owner/operator shall also reduce the incidence of well control loss by following the practices described in Recommended Practice for Well Control Operations.

MM 4.9-15 The owner/operator shall report project-related contamination, including previously unknown injection wells, of a reportable quantity of hazardous substances, as specified in the Code of Federal Regulations Title 40 and/or the California Code of Regulations Titles 22 and 23, which is discovered during Project construction activities and operations. Notification must be made within 24 hours of discovery to Kern County Public Health Environmental Health Division, Kern County Planning and Natural Resources Department and all State and Federal implementing regulatory agencies that have responsibility or oversight of the specific contamination conditions and activity. The owner/operator shall remediate such contamination as required by the Kern County Environmental Health Division and the appropriate implementing regulatory agency.

Level of Significance After Mitigation

Impacts would be less than significant.

Impact 4.9-3: Emit Hazardous Emissions or Handle Hazardous or Acutely Hazardous Materials, Substances, or Waste within 1/4 Mile of an Existing or Proposed School

The CEQA requires that proposed projects near schools evaluate potential health impacts resulting from the emission of or handling of hazardous or acutely hazardous material, substances, or waste.

This also includes extremely hazardous materials and wastes. Emissions associated with the implementation of the project and potential risks associated with emissions of toxic air contaminants are addressed in Section 4.3, *Air Quality*. This discussion focuses on hazardous and acutely hazardous materials, substances, or wastes.

Definitions for extremely hazardous materials and wastes and acutely hazardous materials are provided below.

- "Extremely hazardous material" means a substance or combination of substances which, if human exposure should occur, may likely result in death, disabling personal injury, or serious illness caused by the substance or combination of substances because of its quantity, concentration, or chemical characteristics.
- "Extremely hazardous waste" means any hazardous waste or mixture of hazardous wastes which, if human exposure should occur, may likely result in death, disabling personal injury, or serious illness caused by the hazardous waste or mixture of hazardous wastes because of its quantity, concentration or chemical characteristics (Title 19 CCR).
- Acutely hazardous materials include chemicals at or above the specified threshold quantities or a process that involves a Category 1 flammable gas or a flammable liquid with a flashpoint below 100º Fahrenheit (F) (37.8º Celsius [C]) on site in one location, in a quantity of 10,000 pounds (4535.9 kilograms) or more according to 8 CCR Section 5189.

Some of the acutely hazardous materials that would be used by the project are those associated with capture facilities including diluted amine, concentrated amine, caustic, sulfuric acid, calcium chloride, triethylene glycol, corrosion inhibitors, scale inhibitors, brominated biocide, sodium hypochlorite, and citric acid. Each of these chemicals is classified as hazardous under the criteria of the federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

During all phases of activities, acutely or extremely hazardous materials would have to be transported according to the Hazardous Materials Transport Act, handled and stored according to OSHA and California Fire Code, and disposed of according to RCRA and California Hazardous Waste regulations. Most CCS activities do not require the long-term storage of hazardous or acutely hazardous materials. Some of these types of chemicals would be used during acid-based WST operations defined by SB 4, as well as non-SB 4 routine maintenance operations and generally during the production process.

As described above in Section 4.9.2, *Environmental Setting*, the closest school to the project site is Lost Hills Elementary School, located approximately 6 miles northeast of the CUP CCS Surface Land Area (see Table 4.9-6). California State law requires that new schools should not be located near an above-ground water or fuel storage tank or within 1,500 feet (0.28 miles) of the easement of an above-ground or underground pipeline that can pose a safety hazard as determined by a risk analysis study. Therefore, new schools would not be sited near CCS operations or pipelines. Although State and federal regulations safeguard the handling of acutely hazardous materials during routine operations and these should prevent releases, accidents do occur. Schools and other

locations where people congregate are particularly vulnerable to accidents. Implementation of MM 4.9-16 would be implemented to reduce impacts to a less than significant level.

Mitigation Measures

MM 4.9-16 The owner/operator shall provide a written notice of the specific location of the approved CCS project Surface Land Area using a map along with Assessor Parcel Numbers (APN) and sections with a link to the Kern County Planning and Natural Resources website all of the following agencies:

a. All local school districts within 20 miles

b. California Division of State Architect

c. California Department of Education.

The notice shall be sent within 60 days of the date of the approval of the project and annually by January 31. A final letter shall be sent when the project is decommissioned with information on the responsible party managing the closed facility.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.9-4: Be Located on a Site Which is Included on a List of Hazardous Materials Sites Compiled Pursuant to Government Code § 65962.5 and, as a Result, Would Create a Significant Hazard to the Public or the Environment

Government Code Section 65962.5 requires CalEPA to compile a hazardous materials release sites called the Cortese List. This list is housed in a database called EnviroStor. As described in Section 4.9.2, *Environmental Setting*, one listed hazardous waste or hazardous substance site is known to have occurred in or within proximity to the project area. Status of site is "closed," and a closure letter or other formal closure decision document has been issued for the site.

Project construction would include clearing, excavation, and grading, and drilling of wells. The use of heavy equipment such as earthmovers, scrapers, excavators, dozers, water trucks, paddlewheels, haul vehicles, and graders would likely be used in site preparation. In addition, trenching would be required to enable the placement of the facility pipeline. Such activities involving ground disturbance could occur on or in the vicinity of documented hazardous materials sites that are listed pursuant to California Government Code Section §65962.5. Were this to occur, construction workers, the public, and the environment could be subjected to potential hazards from disturbed contaminated soils on the site, which would be a significant impact. Additionally, unearthing of pre-existing contaminated soil at an identified hazardous waste site, causing pre-existing contamination in one groundwater aquifer to enter another, or disturbing formerly contaminated areas that have been capped has the potential to expose the public or the environment to contamination and, therefore, impacts could be a significant impact. However, implementation

of MM 4.9-5 would properly manage affected soils/wastes that are encountered during ground-disturbing activities. In addition, implementation of MM 4.9-6 would require the sampling of soils in the event that the owner/operator observes evidence of contamination or if soil contamination is suspected during grading or excavation work. Therefore, impacts would be less than significant with mitigation.

Mitigation Measures

Implement MM 4.9-5 and MM 4.9-6, as described above.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.9-5: For a project located within the adopted Kern County Airport Land Use Compatibility Plan, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

The project area is not located within an area covered by the Kern County ALUCP. The nearest airport to the project site is Elk Hills-Buttonwillow Airport, located approximately 14 miles southeast of the project site. Safety hazards are not anticipated for people residing or working in the project area with respect to the project's proximity to an airport.

Drilling rigs for injection wells and potentially other CCS-related facilities could exceed height limits FAA height limits. Lighting on drilling rigs, tanks, roads, pumps, and other facilities could exceed restrictions on lighting type, design, and placement. Whether these facilities or activities would pose a hazard to navigation would be determined by the FAA in response to notification of that agency of a proposed project. Therefore, CCS development-related equipment heights and lighting placement/design could create a significant hazard to aviation safety, with attendant potential impacts to people and the environment, in the vicinity of a public use airport. However, implementation of MM 4.9-17 would be implemented to reduce impacts to a less than significant level.

Mitigation Measures

MM 4.9-17 The owner/operator shall determine whether any proposed construction or alteration meets requirements for notification of the Federal Aviation Administration. If a proposed construction or alteration is found to require notification, the owner/operator shall notify the Federal Aviation Administration and request that the Federal Aviation Administration issue a Determination of No Hazard to Air Navigation. If the Federal Aviation Administration determines that the construction or alteration would result in a potential hazard to air navigation, the owner/operator would be required to work with the Federal Aviation Administration to resolve any adverse effects or airport operations. The owner/operator shall notify the Federal Aviation Administration and the nearest Airport, by completing and submitting Federal Aviation Administration Form 7460-1 if CCS project components or associated development activities are planned that meet one or more of the following criteria:

a. Any construction or alteration exceeding 200 feet above ground level.

b. Any construction or alteration within 20,000 feet of all public use airports except Poso-kern Airport which exceeds a 100:1 surface from any point on the runway.

c. Any construction or alteration within 10,000 feet of the Poso-Kern Airport which exceeds a 50:1 surface from any point on the runway.

d. Any construction or alteration within 5,000 feet of a public use heliport which exceeds a 25:1 surface.

e. When requested by the Federal Aviation Administration.

f. Any construction or alteration located on a public use airport or heliport regardless of height or location.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.9-6: Impair Implementation of, or Physically Interfere with, an Adopted Emergency Response Plan or Emergency Evacuation Plan

Construction

The only emergency response plan in place in the County is for evacuation if the Lake Isabella Dam fails. The project area is not within an adopted emergency response plan or emergency evacuation plan. However, the project would generate construction trips, including the movement of oversize equipment, and the potential for roadway lane closures exist to the sites during construction. These factors could temporarily increase the daily traffic volumes on surrounding local roadways and at intersections. It is anticipated that emergency access would be maintained at all times, and appropriate detours would be provided, as necessary.

While the project would not require closures of public roads, which could inhibit access by emergency vehicles, during construction, heavy construction-related traffic could interfere with emergency response or emergency evacuation procedures in the event of an emergency, such as a wildfire or a chemical spill. Heavy construction-related traffic could also interfere with emergency response to other uses in the vicinity and, therefore, could represent a significant impact.

As described in Section 4.17, *Transportation*, implementation of MM 4.17-1 requires the preparation of a Construction Traffic Control Plan. Implementation of this mitigation measure would minimize the potential for the project to interfere with an adopted emergency response plan or emergency evacuation plan. Therefore, this impact would be less than significant with mitigation.

Operation

As discussed in Impact 4.9-1 above, the potential risk of CO_2 leakage would be a significant impact. Thus, could result in an increase in demand for emergency response and interfere with emergency response to other uses in the vicinity. However, as required by MM 4.9-18, the project proponent would prepare and implement an emergency incident response plan that that addresses emergency medical response.

Therefore, this impact would be less than significant with mitigation.

Mitigation Measures

Implement MM 4.17-1 (see Section 4.17, *Transportation*), and

MM 4.9-18 Prior to commencement of any injection of CO_2, and in addition to the emergency response plan required by the EPA UIC permit, the owner/operator shall prepare an emergency incident response plan that addresses, advance leak detection methods and communication with fire responders, emergency medical response, Kern County Fire and Kern County Sheriff notification and protocols for incident management. The plan shall be reviewed and approved by the Kern County Fire Department in consultation with EPA UIC Program, State of California Fire Marshall, Kern County Sheriff and all other State agencies identified by the California Air Resources Board.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.9-7: Expose People or Structures, Either Directly or Indirectly, to a Significant Risk of Loss, Injury, or Death Involving Wildland Fires

As described above, the project site is classified as SRA Moderate and High fire risk (CAL FIRE 2024); see Section 4.20, *Wildfire*. There is combustible vegetation on and around the project site that would be actively managed during both the construction and operation phases to minimize fire risk. Combustible vegetation would be either limited in height or removed primarily through

a combination of dirt or gravel firebreaks, grazing, and mowing. Vegetation management involving the operation of mechanical equipment and/or the use of fuel or other flammable substances would occur on and around the project site, thereby increasing the potential for igniting a brush fire and triggering a wildland fire.

The addition of two new substations and new overhead 115-kV transmission lines to Aera Energy-owned substations located at the project site would increase wildfire hazards to some degree above baseline conditions. With any electrified equipment, there is potential for accidental ignition of nearby vegetation, particularly during high fire hazard conditions/times of the year. According toh G.O. 95, the project proponent would be required to maintain acceptable clearances between the new/reconductored 115 kV power lines and any nearby trees or other vegetation to minimize the risk of the energized lines igniting wildfires. The two proposed substations and new overhead 115-kV transmission lines would be located within the existing Belridge oilfield designated as a moderate or high fire risk, where wildfire hazard would be expected to be high.

To minimize fire risk from project construction and operation, particularly for vegetation management activities, the project would require implementation of MM 4.9-19, which would require the project to comply with applicable existing codes and ordinances related to the maintenance of mechanical equipment, handling and storage of flammable materials, and cleanup of spills of flammable materials. In addition, implementation of MM 4.9-20 would require a Worker Environmental Awareness Program that include fire prevention and response training for workers using specific equipment and tools. With implementation of these two measures, impacts would be less than significant.

See Section 4.20, *Wildfire*, of this EIR for additional discussion of wildfire issues.

Mitigation Measures

MM 4.9-19 The owner/operator is required to implement the following measures:

a. Comply with Kern County Fire Codes.

b. Maintain firefighting apparatus and supplies required by the Kern County Fire Department.

c. Maintain of a list of all relevant firefighting authorities for each work site.

d. Have available equipment to extinguish incipient fires and or construction of a fire break, such as: chemical fire extinguishers, shovels, axes, chain saws, etc.

e. Carry water or fire extinguishers and shovels in non-passenger vehicles in the field.

f. Have and maintain a supply of fire extinguishers for welding, grinding, and brushing crews in compliance with Cal/OSHA regulations.

g. Use available resources to protect individual safety and to contain any fire that occurs and notify local emergency response personnel.

h. Remove any flammable wastes generated during oil and gas activities regularly.

i. Store all flammable materials used in oil and gas activities away from ignition sources and in approved containers.

j. Allow smoking only in designated smoking areas.

k. Prohibit smoking where flammable products are present and when the fire hazard is high. Train personnel regarding potential fire hazards and their prevention.

l. All internal combustion engines, stationary and mobile, shall be equipped with spark arresters. Spark arresters shall be in good working order.

m. Light trucks and cars with factory-installed (type) mufflers shall be used only on roads where the roadway is cleared of vegetation. Said vehicle types shall maintain their factory-installed (type) muffler in good condition.

n. Fire rules shall be posted on the Project bulletin board at the contractor's field office and areas visible to employees.

o. Equipment parking areas and small stationary engine sites shall be cleared of all extraneous flammable materials.

p. Personnel shall be trained in the practices of the Fire Safety Plan relevant to their duties. Construction and maintenance personnel shall be trained and equipped to extinguish small fires in order to prevent them from growing into more serious threats.

MM 4.9-20 The owner/operator should restrict the use of chainsaws, chippers, vegetation masticators, grinders, tractors, torches, and explosives at its locations, and ensure the sites where this equipment is used are equipped with portable or fixed fire extinguishers and/or a water tank, with hoses, fire rakes, and other tools to extinguish and or control incipient stage fires. The Worker Environmental Awareness Program shall include fire prevention and response training for workers using these tools.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.9-8: Would implementation of the project generate vectors (flies, mosquitoes, rodents, etc.) or have a component that includes agricultural waste? Specifically, would the project exceed the following qualitative threshold: the presence of domestic flies, mosquitoes, cockroaches, rodents, and/or any other vectors associated with the project is significant when the applicable enforcement agency determines that any of the vectors:

i. Occur as immature stages and adults in numbers considerably in excess of those found in the surrounding environment; and

ii. Are associated with design, layout, and management of project operations; and

iii. Disseminate widely from the property; and

iv. Cause detrimental effects on the public health or well-being of the majority of the surrounding population.

Project activities would not result in features or conditions that could potentially provide habitat for vectors, such as the generation of agricultural or food waste; however, implementation of the project would involve construction and operations that could result in standing water, trash piles, or open containers that could provide breeding areas for mosquitoes, flies, or rodents. Project waste may include scrap metal and concrete, empty nonhazardous containers, vegetation waste, food waste from workers, wood, glass, paper, plastics, other forms of solid waste that could result in standing water, trash piles, or open containers that could provide breeding areas for mosquitoes, flies, or rodents. These potential disease vectors could pose a potential hazard to personnel or the public and result in a potentially significant impact. However, implementation of MM 4.9-21 would require the storage and removal of trash in closed containers, prevent standing water accumulation, and obtain permits from regulatory agencies before draining or filling naturally occurring depressions or pools. Therefore, impacts would be less than significant with mitigation.

Mitigation Measures

MM 4.9-21 Owner/operator shall ensure that trash is stored in closed containers and removed from the site at regular intervals. Open containers shall be inverted, and construction ditches shall not be allowed to accumulate water. Construction and maintenance operations shall not generate standing water. Naturally occurring depressions, drainages, or pools at the site shall not be drained or filled without a permit from any regulatory agency having jurisdiction over the resource location.

Level of Significance After Mitigation

Impacts would be less than significant.

4.9.5 Cumulative Setting, Impacts, and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present, and reasonably foreseeable future oil and gas development including wells and abandonment activity to implement CCS projects constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities, and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells per year countywide of various types (production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 other wells (cyclic wells, SB 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for eight years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. CalGEM permitting for all wells with the exception of plugging and abandonments has never averaged over 2,000 permits a year (as implemented in some years of the Kern County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts associated with hazards and hazardous materials is the project area. Because incidents with hazardous materials are, in general, confined to locations where that has been a release or spill, the cumulative impact analysis considers the combined hazardous materials impacts associated with the project and with nearby related projects. The potential hazards associated with the operation of CCS activities are only expected to occur where capture facilities, facility pipelines, and/or injection wells exist. Due to the nature of these operations, upset conditions at one CCS facility are unlikely to affect operations at adjacent CCS facility, and are unlikely to extend beyond oilfield boundaries. Therefore, the hazard impacts associated with the proposed project are not expected to overlap with other hazards.

Impact 4.9-9: Contribute to Cumulative Hazards and Hazardous Materials Impacts

Transport, Disposal, or Release

With regard to the creation of a hazard through the routine transport, use, or disposal of hazardous materials (Impact 4.9-1), a potentially significant impact could result if a spill or leak were to occur during project construction or operation activities; however, compliance with State and County regulations and the mitigation measures outlined above would ensure that impacts would remain less than significant. This impact does not have the potential to combine with contamination from spills from other projects within 0.5 miles of the site to result in a cumulative impact due to the site-specific nature of soil contamination and the mitigation measures that would ensure proper cleanup and disposal of contaminated soil. Cumulative contamination of groundwater is discussed in Section 4.10, *Hydrology and Water Quality*. Therefore, impacts of the project would not be expected to make a cumulatively considerable contribution, in combination with impacts from past, present, or reasonably foreseeable projects, to result in a cumulative impact.

With regard to the creation of a hazard through upset or accident conditions involving a hazardous material release (Impact 4.9-2), the potential exists for construction and operation activities, through the implementation of the project, to result in the release of hazardous materials in the soil resulting in exposure of personnel and other sensitive receptors to contaminant levels that could result in short-term and/or long-term health effects. Additionally, CO_2 leakage from pipelines could pose a hazard to personnel, the public, and the environment; however, conformance with existing State and County regulations, project safety design features, and implementation of the mitigation measures identified above would render this impact less than significant. This impact does not have the potential to combine with impacts of other projects because of the localized nature of the impacts, and because appropriate safety, cleanup, and disposal methods would be implemented to reduce the impact to a level that would not combine with the impacts from other projects. Therefore, project impacts would not have the potential to make a cumulatively considerable contribution in combination with impacts from past, present, or reasonably foreseeable projects to result in a cumulative impact.

With regard to the creation of a hazard to the public or the environment as a result of being located on a site that is included on a list of hazardous material sites compiled pursuant to Government Code § 65962.5 (Impact 4.9-4), although listed sites are located in the project area, implementation of MM 4.9-5 and MM 4.9-6 would ensure that the owner/operator not only has a method to address unanticipated or project-related contamination, but they have also proactively evaluated whether there is a potential hazardous waste site where they would be operating and have made measure to avoid disturbing it. Therefore, project impacts would not have the potential to combine with impacts from past, present, or reasonably foreseeable projects to result in a cumulative impact.

ALUCP

With regard to the creation of a safety hazard for a project located within the Kern County ALUCP (Impact 4.9-5), the project does not occur within the Kern County ALUCP; however, drilling rigs for injection wells and potentially other CCS-related facilities could exceed height limits FAA height limits, which could create a significant hazard to aviation safety, with attendant potential impacts to people and the environment, in the vicinity of a public use airport. Implementation of MM 4.9-17 outlined above would reduce this impact to a level that would not combine with other projects. Therefore, impacts of the project would not have the potential to make a cumulatively considerable contribution, in combination with impacts from past, present, or reasonably foreseeable projects, to result in a cumulative impact.

Emergency Plan

With regard to interference with an adopted emergency response plan or emergency evacuation plan (Impact 4.9-6), it would be unlikely that project-related activities would interfere with an adopted emergency response plan or emergency evacuation plan. The project's less than significant impact has the potential to combine with other current and future projects that would generate high volumes of traffic on area roadways by creating a cumulative traffic burden on regional roadways; however, given the overall rural nature of the project area, and implementation of MM 4.17-1 and MM 4.9-18 outlined above, the potential for a considerable contribution to a cumulative impact to emergency response is unlikely to occur and would, therefore, be less than significant.

Wildland Fire

With regard to exposing people or structures to a wildland fire hazard (Impact 4.9-7), construction, operation, and maintenance would increase the likelihood of wildfire ignition; however, implementation of MM 4.9-19 and MM 4.9-20 outlined above would substantially reduce the possibility of a project-related ignition, rendering this impact less than significant. Mitigation would reduce this impact to a level that would not combine with other projects. Therefore, project impacts would not have the potential to make a cumulatively considerable contribution, in combination with impacts from past, present, or reasonably foreseeable projects, to result in a cumulative impact.

Disease Vectors

With regard to generating disease vectors (Impact 4.9-8), project construction and operation activities could attract other disease vectors by allowing standing water, trash piles, or open containers to accumulate at the project site, potentially resulting in a hazard to construction personnel or the general public. However, implementation of the MM 4.9-21 described above would reduce this impact to a less than significant level. Mitigation would reduce this impact to a level that would not combine with other projects, therefore, impacts of the project would not have the potential to make a cumulatively considerable contribution, in combination with impacts from past, present, or reasonably foreseeable projects, to result in a cumulative impact.

Mitigation Measures

Implement MM 4.9-1 through MM 4.9-21, as described above, risk reduction measures, as described in Section 4.7, *Geology and Soils*, and mitigation measures to maintain water quality, as described in Section 4.9, *Hydrology and Water Quality*.

Level of Significance after Mitigation

Cumulative impacts would be less than significant.

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Section 4.10

Hydrology and Water Quality

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Section 4.10

Hydrology and Water Quality

4.10.1 Introduction

This section of the Environmental Impact Report (EIR) describes the hydrological environmental and regulatory settings, addresses potential impacts that would result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project) on hydrology and water quality, and discusses mitigation measures to reduce impacts, where applicable. The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers) southwest of the community of Lost Hills and west of State Route (SR) 33.

This section relies partially on technical documents provided by Stantec Consulting Services Inc. for the project—specifically, the Aquatic Resources Delineation Report (Appendix C-2), Desktop Geohazards and Geotechnical Assessment (Appendix E-1), Preliminary Hydrology Study, and Water Supply Assessment provided in Appendices G-1 and G-2 of this EIR, respectively. Additional information in this section is based, in part, on the Underground Injection Control (UIC) Permit Application submitted to the U.S. Environmental Protection Agency (EPA) Region 9 on January 19, 2023, (included in Appendix E-2). The Preliminary Hydrology Study prepared by Stantec (see Appendix G-1) includes a pre-development versus post-development peak runoff comparison and a scour analysis at major drainageway crossings. The UIC Permit Application includes information regarding the project's potential impact on underground sources of drinking water and provides information regarding regulations required for the injection of carbon dioxide (CO_2) underground for storage purposes. Results from the analyses are incorporated in this section of the EIR.

A description of the environmental setting (affected environment) for hydrology and water quality is presented in Section 4.9.2, *Environmental Setting*. The regulatory setting applicable to recreation is presented in Section 4.9.3, *Regulatory Setting*, and Section 4.9.4, *Impacts and Mitigation Measures* discusses project impacts and associated mitigation measures.

4.10.2 Environmental Setting

Regional Setting

The project site is in the southern portion of the San Joaquin Valley within the Tulare Lake Hydrologic Region. The Tulare Lake Hydrologic Region is a triangle-shaped, topographically closed basin bordered to the east by the Sierra Nevada, to the west by the Coast Ranges, and to the south by the Tehachapi Mountains.

Tulare Lake Hydrologic Region

The California Department of Water Resources (DWR) has divided the state into 10 hydrologic regions. The Tulare Lake Hydrologic Region comprises the drainage area of the San Joaquin Valley south of the San Joaquin River encompassing approximately 16,800 square miles and includes Kings, Tulare, Fresno, and Kern counties (see Figure 4.10-1). The Hydrologic Region is ranked as "high priority" in a statewide ranking of groundwater importance. Groundwater is primarily used for agriculture, which accounts for 95 percent of the region's annual groundwater use (DWR 2006).

San Joaquin Valley-Kern County Subbasin

The San Joaquin Valley-Kern County Subbasin (Subbasin) is the specific groundwater subbasin in which the project resides and has a surface area of approximately 1,945,000 acres. The Subbasin has a surface area of approximately 3,040 square miles. The project area is in the western portion of the Subbasin within the Belridge oilfields, which comprises approximately 34 square miles (21,760 acres). Kern Groundwater Authority (KGA) is the principal groundwater management agency for the Subbasin.

The San Joaquin Valley represents the southern portion of the Great Central Valley of California. The San Joaquin Valley is a structural trough up to 200 miles long and 70 miles wide filled with up to 32,000 feet of marine and continental sediments deposited during periodic inundation by the Pacific Ocean and by erosion of the surrounding mountains, respectively. Continental deposits shed from the surrounding mountains form an alluvial wedge that thickens from the valley margins toward the axis of the structural trough. This depositional axis is slightly west of the series of rivers, lakes, sloughs, and marshes that mark the current and historic axis of surface drainage in the San Joaquin Valley. Water-bearing formations in the Subbasin are located in the shallow to intermediate depths of the groundwater Subbasin and are primarily continental deposits of Tertiary and Quaternary age.

The Plio-Pleistocene non-marine Tulare Formation occurs in the central and western portions of the Subbasin and has a maximum thickness of 2,200 feet. The formation is separated into an upper and lower portion by a confining clay layer called the Corcoran Clay or modified E-clay. The upper aquifer is unconfined to semiconfined. The lower aquifer is confined. The Corcoran Clay extends from the western to the central portion of the Subbasin. The thickness of the Corcoran Clay ranges between 20 and 100 feet but is typically 10 to 30 feet thick (Stantec 2023b).

The Mio-Pliocene to early Pleistocene Kern River Formation occurs along the eastern to central portion of the Subbasin and was derived from erosion of the Sierra Nevada Mountains. The Kern River Formation attains a maximum thickness of 2,600 feet. The aquifer is largely unconfined although thin aquitards in the central portion of the Subbasin locally creates semiconfined conditions (Stantec 2023b).

Older alluvial deposits of Pleistocene age overlie the Tulare and Kern River formations and attain a maximum thickness of 250 feet. These deposits are often indistinguishable from the underlying Tulare and Kern River formations (Stantec 2023b). The aquifer is unconfined. The Holocene-age younger alluvium and floodplain deposits are up to 150 feet thick and vary on lithology across the

Subbasin. They are generally coarser grained near the Subbasin boundaries and become finer grained toward the basin bottom where they underlie Kern and Buena Vista Lake beds.

Climate

The climate in the region is characterized as arid to semi-arid with average annual precipitation of 6 to 7 inches per year. On average, the valley floor receives 8.32 inches of precipitation per year, mostly between November and April. Average temperatures are relatively high and total evaporation exceeds total precipitation. Winter is generally mild, but an occasional freeze may cause substantial agricultural damage. The majority of rainfall occurs between January and March. Summers are characterized as dry with high temperatures and low humidity. Average high temperatures range from 57.4 degrees Fahrenheit (°F) in January to 98.6°F in July. Average low temperatures range from 38.5°F in December and January to 69.2°F in July.

Figure 4.10-1: Department of Water Resources Designated Groundwater Basins and Subbasins

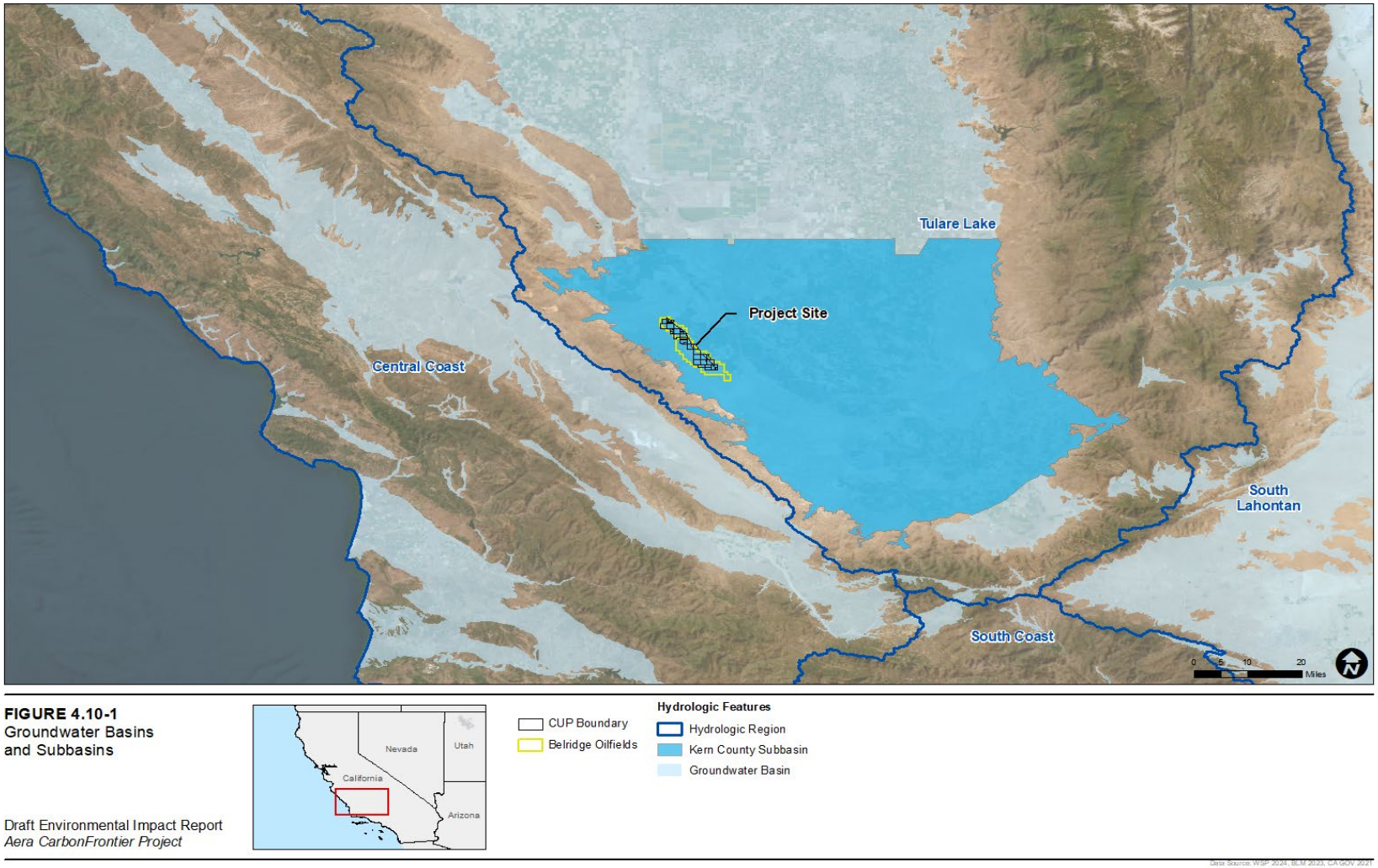


FIGURE 4.10-1
Groundwater Basins and Subbasins

Draft Environmental Impact Report
Aera CarbonFrontier Project

Source: WSP 2024

A "water year" in California runs from September 30 to October 1 of the following year. California typically receives 50 percent of its precipitation in December, January, and February in the form of snow in the Sierras. The snowpack in the Sierras typically stores water throughout the winter months and then releases it in the spring.

Topography and Hydrology

The major topographic feature in the region is the southern San Joaquin Valley, where the topography is generally flat. Steeper, mountainous topography is present in the Sierra Nevada Mountains to the east, the San Emigdio and Tehachapi Mountains to the south, and the Coast Range Mountains to the west.

The natural hydrology of the Basin has been extensively modified over the last 150 years by irrigation, flood control, and land reclamation. Dams and reservoirs have been constructed on all of the large rivers that drain into the Basin for flood control, water supply, and hydroelectric generation. State, federal, local, and privately owned water conveyance facilities, such as aqueducts, pipelines, ditches, and canals, have also been constructed throughout the region to facilitate the movement of water into and out of the Basin.

The Kern River is the southernmost of the four major rivers in the Basin and is the major surface water feature in the Kern River Basin, flowing from the Sierra Nevada in the northeast to the Central Valley in the southwest. The riverbed extends through urban Bakersfield and is typically dry except during storm events and under wet hydrologic conditions when water is released upstream from Lake Isabella for flood management or local water banking purposes. Lake Isabella was created by a dam completed by the U.S. Army Corps of Engineers (USACE) in 1953. The Lake Isabella dam consists of the main dam and an auxiliary dam, which are located 2,000 feet apart. The dam is 33 miles east of the valley floor at the junction of the mainstem and south fork of the Kern River. The main earthfill dam is 185 feet high and 1,725 feet long, and the auxiliary earthfill structure is 100 feet high and 3,275 feet long. The gross storage capacity of both dams is 568,100 acre-feet (af). The total capacity may be used to control snowmelt floods. As discussed in the next section, the dam is managed by the USACE to reduce potential structural failure risks during an ongoing safety modification program that was substantially completed in 2022 (USACE 2023).

From the Lake Isabella dam, the Kern River flows southwest until it emerges from a deep canyon northeast of Bakersfield. Water flowing from the canyon is diverted into canals by several weirs for use in the city of Bakersfield. During wetter conditions, surface water is released downstream for groundwater recharge operations. Depending on the amount and timing of rainfall and snowmelt, surface water from the Kern River that is not diverted or used for groundwater recharge may ultimately flow into the Buena Vista lakebed, the Kern River Intertie, and the California Aqueduct; or north toward the historical Tulare Lake Basin via the flood canals. The westerly portions of the Kern River and several of the diversion, recharge, and flood facilities that capture or convey river flows are located within the region.

Poso Creek is located to the north of the Kern River and intermittently conveys rainfall and snowmelt from the Greenhorn Mountains to the valley floor. The creek flows west through the

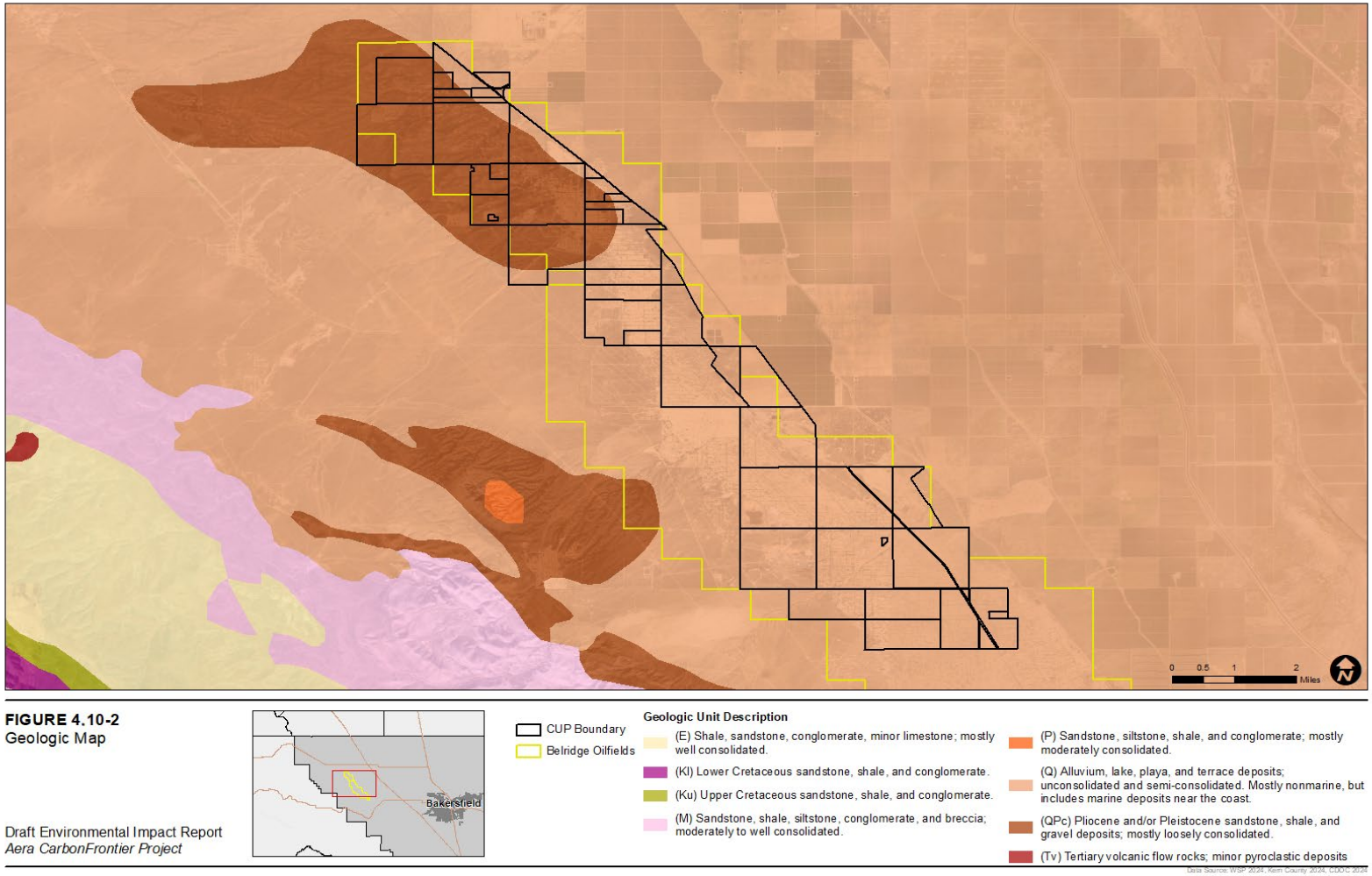
region and terminates at the federally owned Kern National Wildlife Refuge in the northwest portion of the County. The primary constructed water conveyance facilities in the region are: (1) federally owned and operated facilities associated with the Central Valley Project, including the Friant-Kern Canal, which transports water from Sierra Nevada streams, the Sacramento Delta, and other sources to Kern County; and (2) facilities associated with the California owned and operated State Water Project (SWP), including portions of the California Aqueduct, which transport water south to Kern County and other locations from the Sacramento Delta. Major groundwater recharge and storage facilities include the 30-square-mile Kern Water Bank, owned and operated by the Kern Water Bank Authority, the Pioneer Project (owned by the Kern County Water Agency), and storage and banking facilities that are owned and operated by several incorporated water districts in the region.

Project Area Setting

Hydrogeology

In the project area, the Tulare Formation is overlain by the Corcoran Clay Equivalent over most of the South Belridge oilfield and in the southeastern portion of the North Belridge oilfield. Alluvium overlies the Tulare Formation in the South Belridge oilfield but has been largely removed by erosion in the North Belridge oilfield exposing the Tulare Formation. The Tulare Formation is partially saturated beneath the project area and is a source of produced water where wells extract oil from this formation. The alluvium in the eastern portion of the South Belridge oilfield contains perched groundwater in up to two thin aquifers. However, it is not used for water supply. Groundwater flow in the alluvium and Tulare Formation is to the east and northeast. Most of the project area is within a California Geologic Energy Management Division-designated Tulare Aquifer Exemption Area. The extent of the existing Tulare Aquifer Exemption Area is approximately 13,275 acres. Vertical confinement of the Tulare Formation is provided by low-permeability formations, including the Upper and Lower Santos, Carneros, and Media Shales, which overlie the injection zone; as well as thousands of feet of low-permeability strata in the Monterey, Etchegoin, and San Joaquin Formation. Lateral confinement in the project area is provided by geologic structural controls (Stantec 2023b).

Figure 4.10-2: Geologic Map



Source: WSP 2024

Surface Water and Quality

The topography of the project area is relatively flat, interrupted only by oil and gas infrastructure, and slopes gradually from west to east towards the San Joaquin Valley. The project area ranges from 675 feet above mean sea level (amsl) on the western edge down to 550 feet amsl on the eastern edge. Chico Martinez Creek, an ephemeral stream toward the southern end of the project site, is the most prominent remaining regional stream draining from the southwest to the northeast through the South Belridge oilfield toward the Central Valley. The source of the historic Chico Martinez Creek is located on the eastern slope of the Temblor Range, and it generally flows east where it terminates approximately 0.55 miles southwest of Lost Hills Highway Kern County, California.

There are unnamed surficial drainages throughout the project area that drain in the direction of the natural topography. Generally, local drainages that exist within the northwestern area of the project typically drain downslope to the north, and drainages within the more southeastern area of the project drain to the north down slopes facing north and south on slopes facing south toward the Buena Vista Lake area. Surface water flow is unlikely to exist within these local drainages unless during heavy precipitation events. As part of the requirements of the Clean Water Act (CWA), beneficial uses for surface and ground waters must be identified in the Central Valley Regional Water Quality Control Board's (RWQCB) Tulare Lake Basin Water Quality Control Plan (Basin Plan).

Groundwater Resources and Quality

The project site is within the San Joaquin Valley-Kern County Groundwater Basin, which is one of 12 distinct groundwater basins of the Tulare Lake Hydrologic Region.

The Subbasin's freshwater groundwater-bearing units consists of younger alluvium and floodplain deposits (shallow unconfined aquifer), older alluvium (unconfined aquifer), Tulare Formation (semiconfined/confined aquifer), and Kern River Formation (unconfined/semiconfined) (Stantec 2023b). The older alluvium/stream deposits and the underlying Tulare and Kern formations form the primary aquifers in the Subbasin. Other locally important groundwater-bearing units include the Santa Margarita Sandstone and Olcese Sand in the eastern and northeastern portions of the Subbasin (Stantec 2023b). Natural groundwater recharge within the Subbasin is primarily from stream seepage along the eastern Subbasin and the Kern River. Groundwater is naturally degraded and of poor quality throughout most of this area due to the presence of geologic sediments derived from marine environments, some of which contain saline connate water. Since groundwater quality within the project area is of very poor quality, the area must rely entirely on imported surface water supplies. The closest permanent source of surface water to the project site is the California Aqueduct, which runs roughly parallel to the project sites, approximately 3 miles to the east.

The project area is located within the Westside District Water Authority (WDWA) plan area, which is described as predominantly made up of barren land or oil fields. The approximate surface elevation of the project site is 546 feet amsl. Depth to water in the fall of 2022 ranged between 34 and 124 feet below ground surface (bgs). However, depth to groundwater is estimated at over from 150 feet bgs to 500 feet bgs in the project area. Lastly, any groundwater that is encountered in this area is generally unusable because of high salinity levels.

Portions of the project are located within the service area of the Belridge Water Storage District (BWSD), which relies on imported SWP surface water supplies from the California Aqueduct purchased through Kern County Water Agency (KCWA), a state water contractor, to meet the water supply needs of its water users. The BWSD predominantly delivers SWP water to water users for agricultural purposes but also provides a small amount of water for industrial use in oil recovery operations at the Belridge oilfields.

Groundwater quality in the Buena Vista Groundwater Sustainability Agency (BVGSA) is variable with total dissolved solids concentrations in the northern portion of the plan area greater than 1,500 milligrams per liter (mg/L) and less than 1,000 mg/L in the southern portion of the plan area (Stantec 2023c). Nitrate (N) concentrations are generally less than 10 mg/L except in the northernmost portion of the plan area where it exceeds 20 mg/L (Stantec 2023c). Arsenic concentrations locally exceed the Primary Drinking Water Maximum Contaminant Level of 10 micrograms per liter (µg/L) throughout the project area (Stantec 2023c).

The Class VI UIC Permit Application (Appendix E-2) stated that there are no water supply wells within the Area of Review. Two potential underground sources of drinking water (USDWs) were identified and most of the area was either dry or the water contained solid concentrations exceeding acceptable USDW limits. The lowermost potential USDW is separated from the proposed injection zone by more than 7,000 feet of strata, including many confining zones. Therefore, the injection of CO_2 associated with the development of the proposed storage complex is not expected to impact the groundwater quality of potential USDWs.

Oil and Gas Production

The project area produces petroleum. Impacts on BWSD's groundwater supply by these operations, both actual and potential, are continuously monitored and evaluated. To date, no significant threat to groundwater quality has occurred because of local oil and gas operations. Produced water in western Kern County is typically managed by either recycling it for enhanced oil recovery operations, such as steam or cyclic steam flooding, or by permitted disposal under the regulatory oversight of the California Department of Oil and Gas. A significant percentage of the oil field-produced water in the project area is either recycled into the same geologic zones from which it was produced or is sequestered in deeper zones that are isolated from sources of drinking water. This water is supplemented by water purchased from Western Kern Water District (WKWD), which indicates that very little water is disposed of, since purchasing fresh water is more expensive than recycling water.

Soil Types and Erosion

Soil conditions for the project site were evaluated in the Aquatic Resources Delineation Report (Appendix C-2). According to the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), seven soil map units occur in the project area. The map units are summarized in Table 4.10-1 and shown in Appendix C-2.

Table 4.10-1: Soil Map Units within the Project Footprint

Map Unit Symbol	Map Unit Name	Description	Hydric	Acreage in Project Footprint
174	Kimberlina fine sandy loam, 0-2% slopes	The Kimberlina series consists of very deep, well-drained soils on flood plains and recent alluvial fans. These soils formed in mixed alluvium derived dominantly from igneous and/or sedimentary rock sources.	No	1,303.73
175	Kimberlina fine sandy loam, 2-5% slopes	The Kimberlina series consists of very deep, well-drained soils on flood plains and recent alluvial fans. These soils formed in mixed alluvium derived dominantly from igneous and/or sedimentary rock sources.	No	233.00
176	Kimberlina fine sandy loam, 5-9% slopes	The Kimberlina series consists of very deep, well-drained soils on flood plains and recent alluvial fans. These soils formed in mixed alluvium derived dominantly from igneous and/or sedimentary rock sources.	No	9.73
196	Milham sandy loam, 0 to 2 percent slopes Major Land Resource Area 17	The Milham series consists of very deep, well-drained soils on alluvial fans, plains, low terraces, and fan remnants. These soils formed in mixed calcareous alluvium weathered from granitic and sedimentary rock.	No	549.27
197	Milham sandy loam, 2 to 5 percent slopes	The Milham series consists of very deep, well-drained soils on alluvial fans, plains, low terraces, and fan remnants. These soils formed in mixed calcareous alluvium weathered from granitic and sedimentary rock.	No	399.05
211	Panoche clay loam, 0 to 2 percent slopes	The Panoche series consists of very deep, well-drained soils on alluvial fans and floodplains. These soils formed in loamy calcareous alluvium from sedimentary rock.	No	449.38
212	Panoche clay loam, 2 to 5 percent slopes	The Panoche series consists of very deep, well-drained soils on alluvial fans and floodplains. These soils formed in loamy calcareous alluvium from sedimentary rock.	No	350.22
Total				**3,294.38**

Source: Stantec 2023a

Erosion and sedimentation are natural processes driven by surface runoff that can be accelerated by human activities, such as construction earthwork activities. During construction, removal of vegetation or impervious areas (such as concrete or asphalt) expose soils to precipitation and surface runoff and can accelerate surface soil erosion. The process may result in the loss of topsoil and creation of erosional features including rills and gullies. Erosion potential is determined by four principal factors: the characteristics of the soil, the extent of vegetative cover, topography, and

climate. Soil texture and permeability determine the resistance of soil to entrainment by surface runoff. Vegetative cover plays a critical role in controlling erosion by shielding and binding the soil. Slope influences the rate of runoff and is directly correlated with erosion potential where flatter topography has a much lower potential for erosion. The intensity and duration of rainfall determines the extent and the capacity for flowing water to detach and transport soil particles.

Excessive erosion can cause a loss of land or possibly increase flooding. Increased sedimentation can also restrict storm drains and channels and lead to flooding during storms that the drainage system should capably handle. In addition, development can increase the likelihood of erosion and sedimentation along unlined drainage channels because of increased stormwater flows.

The predominantly fine-grained soils underlying the project site are potentially susceptible to erosion or the loss of topsoil due to surface water flows and wind-driven movement. The on-site soils have a very low to medium runoff potential (the potential for water to runoff into drainage channels vs. infiltrate directly into the soil). The erosion potential for each on-site soil was also determined using the K-Factor. The soil-erodibility factor (K) represents:

1) Susceptibility of soil or surface material to erosion;

2) Transportability of the sediment; and

3) Amount and rate of runoff given a particular rainfall input, as measured under a standard condition.

Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff, although these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment, and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high runoff rates and large runoff volumes (Stantec 2023a).

Floodplains

Flooding is a temporary condition in which land that is normally dry is partially or completely inundated. Flooding occurs when water bodies, such as streams, rivers, lakes, or reservoirs, are abnormally high and overflow into adjacent low-lying areas. These areas are known as floodplains, defined by their exposure to risk of recurring floods.

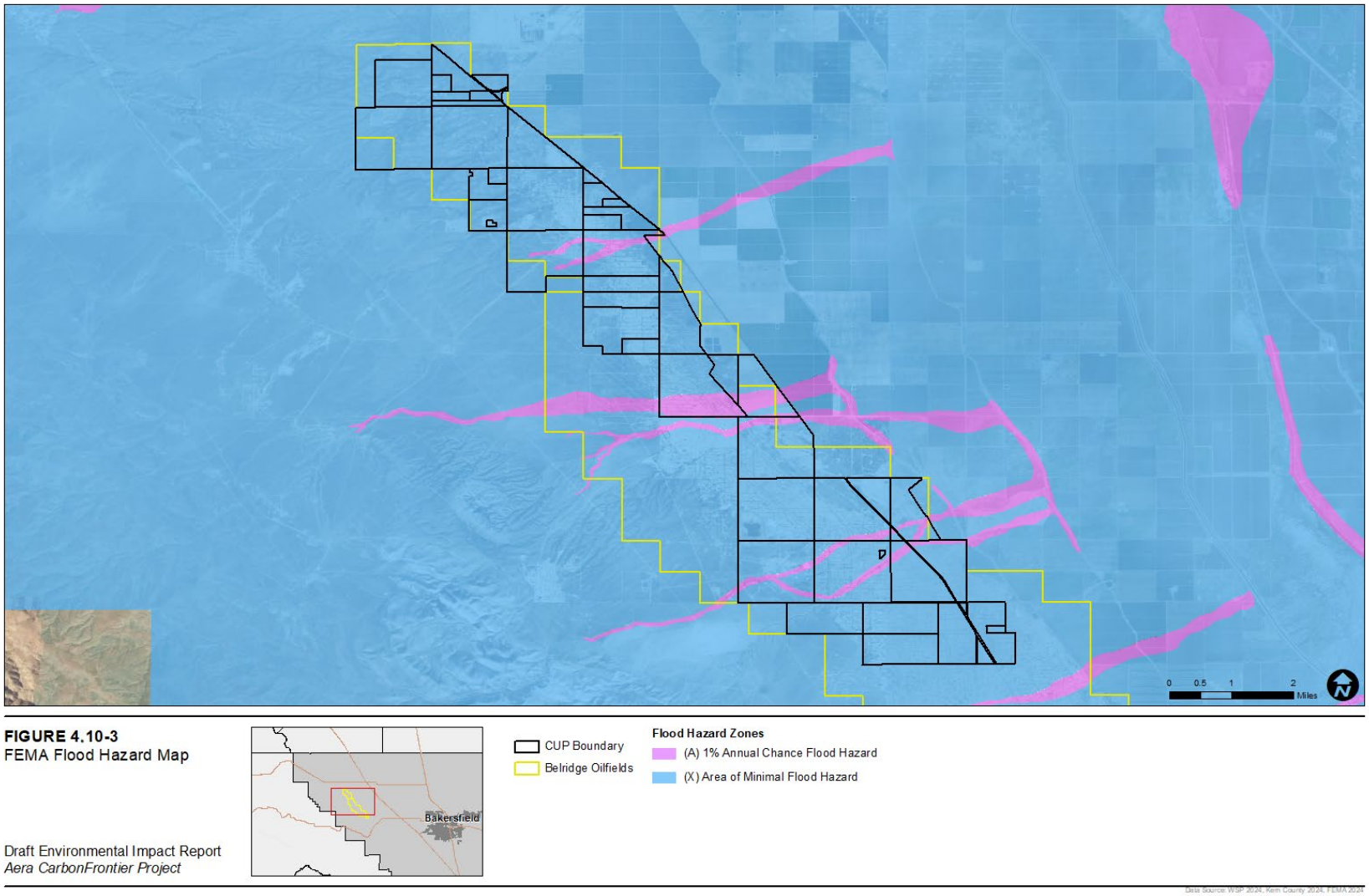
A Flood Insurance Rate Map (FIRM) is the official map prepared by the Federal Emergency Management Agency (FEMA) to delineate both the special flood hazard areas and the flood risk premium zones applicable to a community (Figure 4.10-3). FEMA designates flood zones using a series of letters, for example, Zone A areas are subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies and Zone X areas experience minimal flooding. FEMA has designated the central and southern portions of the project

site as Zone A. All other portions of the project site are located in an area designated by the FEMA as Zone X, which is an area of minimal flood hazard, and are outside of the 0.2 percent annual chance floodplain.

The project area is located in three FIRM areas (FIRMs 06029C1175E, 06029C1675E, and 06029C1700E). The three FIRM areas are designated as both Zone A and X.

According to the Kern County General Plan (KCGP), portions of the project site are designated as Flood Hazard Overlay (Kern County 2009).

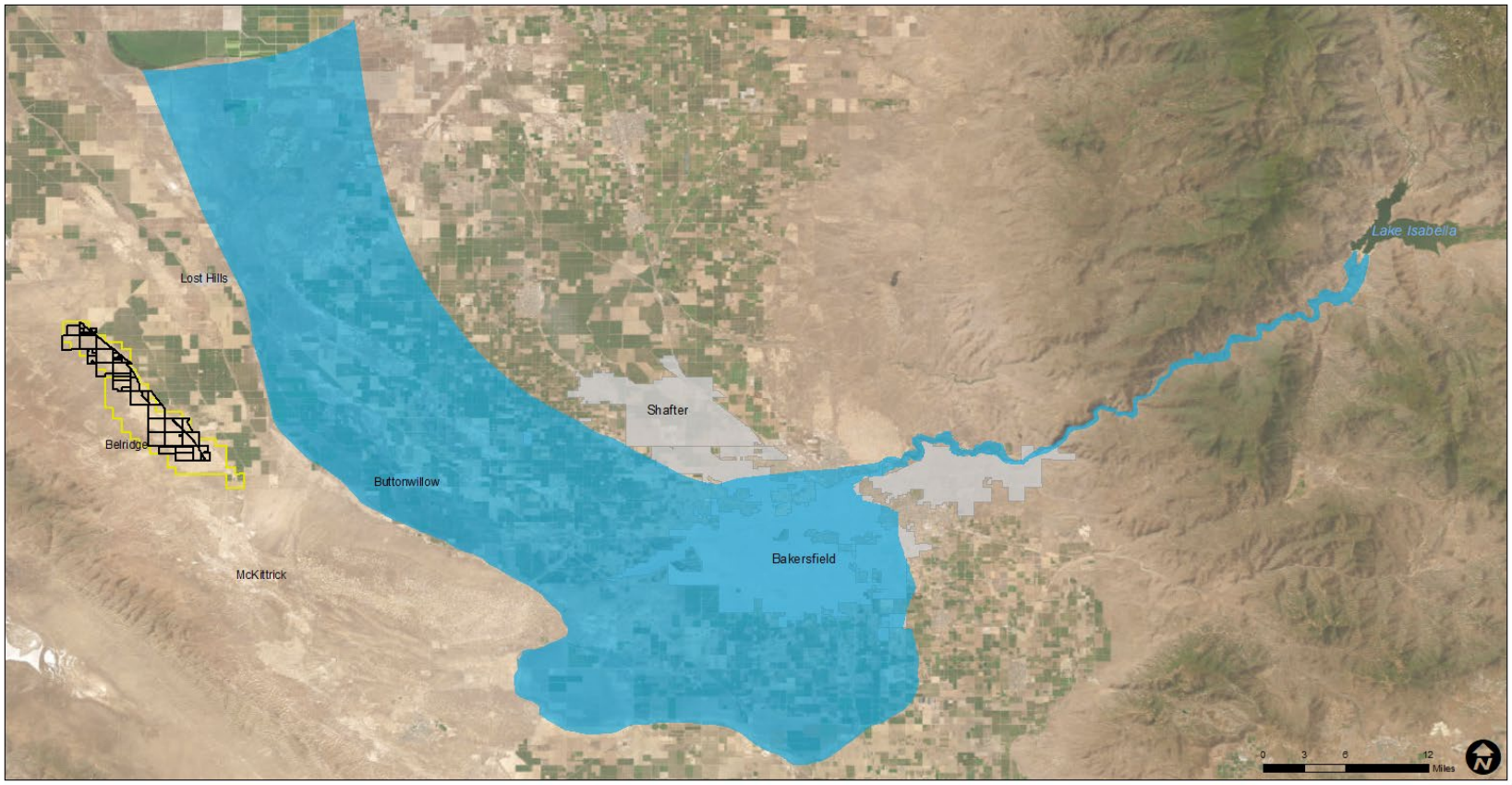
Figure 4.10-3: FEMA Flood Hazard Map



Dam Failure, Seiche, and Tsunami

The USACE prepares flood inundation maps in the event of a dam failure, including the closest dam (the Lake Isabella dam east of Bakersfield). The Lake Isabella dam is outside of dam inundation areas as defined by the KCGP as it is located approximately 70 miles east of the project area and the flood waters would not reach the project area because of its distance and topography (Figure 4.10-4). A tsunami is a series of ocean waves generated by sudden displacements in the sea floor, landslides, or volcanic activity. A seiche is a standing wave in an oscillating body of water. The project area is located approximately 71 miles east of the Pacific Ocean and there are no enclosed bodies of water within the project area. Therefore, the risk for tsunami or seiche in the project area is very low.

Figure 4.10-4: Lake Isabella Dam Failure



4.10.3 Regulatory Setting

Federal

Clean Water Act (33 U.S.C. §1321 et seq.)

The CWA (33 United States Code [U.S.C.] Section 1251 et seq.), formerly the Federal Water Pollution Control Act of 1972, was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA required states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain nonpoint source discharges to surface water. Those discharges are the regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (CWA Section 402). In California, NPDES permitting authority is delegated to, and administered by, the nine RWQCBs. The project site is within the Central Valley RWQCB. Projects that disturb one or more acres, including the proposed project, are required to obtain NPDES coverage under construction general permits.

Section 401, Water Quality Certification

Section 401 of the CWA requires that, prior to issuance of any federal permit or license, any activity (including river or stream crossing during road, pipeline, or transmission line construction) that may result in discharges into waters of the United States must be certified by the state, as administered by the RWQCB. This certification ensures that the proposed activity does not violate state and/or federal water quality standards.

Section 402, National Pollutant Discharge Elimination System

Section 402 of the CWA authorizes the State Water Resources Control Board (SWRCB) to issue an NPDES General Construction Storm Water Permit (Water Quality Order 2009-0009-DWQ), referred to as the "General Construction Permit." Construction activities can comply with and be covered under the General Construction Permit provided that they meet the following criteria:

- Develop and implement a Storm Water Pollution Prevention Plan (SWPPP) that specifies best management practices (BMPs) that will prevent all construction pollutants from contacting stormwater and intend to keep all products of erosion from moving off-site into receiving waters.
- Eliminate or reduce non-stormwater discharges to storm sewer systems and other waters of the United States.
- Perform inspections of all BMPs.

NPDES regulations are administered by the Central Valley RWQCB at the project site.

Section 404, Discharge of Dredged or Fill Material

CWA Section 404 regulates the discharge of dredged and fill materials into waters of the United States, which include all navigable waters, their tributaries, and some isolated waters, as well as some wetlands adjacent to the aforementioned waters (33 Code of Federal Regulations (CFR) Section 328.3). Areas typically not considered to be jurisdictional waters include non-tidal drainage and irrigation ditches excavated on dry land, artificially irrigated areas, artificial lakes or ponds used for irrigation or stock watering, small artificial waterbodies such as swimming pools, and water-filled depressions (33 CFR Part 328). Areas meeting the regulatory definition of waters of the United States are subject to the jurisdiction of USACE under the provisions of CWA Section 404. Construction activities involving placement of fill into jurisdictional waters of the United States are regulated by USACE through permit requirements. No USACE permit is effective in the absence of state water quality certification pursuant to Section 401 of the CWA.

Section 303, Water Quality Standards and Implementation Plans

Section 303(d) of the CWA (33 U.S. Code 1250, et seq., at 1313(d)) requires states to identify "impaired" water bodies as those that do not meet water quality standards. States are required to compile this information in a list and submit the list to the EPA for review and approval. This list is known as the Section 303(d) list of impaired waters. As part of this listing process, states are required to prioritize waters and watersheds for future development of total maximum daily loads (TMDL) requirements. The SWRCB and RWQCBs have ongoing efforts to monitor and assess water quality, prepare the Section 303(d) list, and develop TMDL requirements.

The Safe Drinking Water Act of 1974 (42 U.S.C. §300f et seq.)

The Safe Drinking Water Act (SDWA) was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect all waters actually or potentially designed for drinking use, whether from aboveground or underground sources, including rivers, lakes, reservoirs, springs, and groundwater wells (EPA 2016). The SDWA authorizes the EPA to set national health-based standards for drinking water to protect against both naturally occurring and man-made contaminants that may be detected in drinking water.

Oil and gas extraction typically produces large amounts of brine, which can contain toxic metals and radioactive substances. These brines can cause damage to the environment and public health if discharged into water or land. Deep underground injection of brines in formations isolated from USDWs prevents soil and contamination. Injection became the preferred way to dispose of waste fluids when states began to implement rules preventing disposal of brine to surface water bodies and soils (EPA 2016).

The EPA has authority under the SDWA to regulate the subsurface injection of fluids below, into, and above a USDW and has established an UIC program by regulations promulgated under the Act (40 CFR 144-147). A USDW is defined as any aquifer that (1) supplies a public water system or (2) contains enough groundwater to supply a public water system and either currently supplies drinking water for human consumption or contains less than 10,000 mg/L of TDS. An injection

well is used to place fluid underground into porous geologic formations that may range from deep sandstone or limestone to a shallow soil layer. Injected fluids may include water, wastewater, brine (saltwater), or water mixed with chemicals (EPA 2016). The EPA ensures that underground injection wells do not endanger any current and future underground or surface sources of drinking water (EPA 2016). Injection wells are separated into six classes. Class I wells inject hazardous and non-hazardous wastes into deep, isolated rock formations that are separated from the lowest USDW by layers of impermeable clay and rock. Class II wells inject fluids associated with oil and natural gas production operations. Class III wells inject super-heated steam, water, or other fluids into formations to dissolve and extract minerals. Class IV wells inject hazardous or radioactive wastes into USDWs and were banned by the EPA in 1984 (EPA 2016). Class IV wells may only operate as part of an EPA or state-authorized groundwater cleanup action. Class V injection wells include wastewater disposal wells used by the geothermal industry and shallow septic system and cesspool wells that drain liquid waste into the ground. Class VI wells are used to inject CO_2 into deep rock formations for long-term underground storage, also called geologic sequestration or "storage." Geologic storage refers to technologies to reduce CO_2 emissions to the atmosphere and mitigate climate change (EPA 2016).

National Flood Insurance Act

FEMA is responsible for managing the National Flood Insurance Program (NFIP), which makes federally backed flood insurance available for communities that agree to adopt and enforce floodplain management ordinances to reduce future flood damage. The NFIP, established in 1968 under the National Flood Insurance Act, requires that participating communities adopt certain minimum floodplain management standards, including restrictions on new development in designated floodways, a requirement that new structures in the 100-year flood zone be elevated to or above the 100-year flood level (known as base flood elevation), and a requirement that subdivisions be designed to minimize exposure to flood hazards.

To facilitate identifying areas with flood potential, FEMA has developed FIRMs that can be used for planning purposes, including floodplain management, flood insurance, and enforcement of mandatory flood insurance purchase requirements. Kern County is a participating jurisdiction in the NFIP and, therefore, all new development must comply with the minimum requirements of the NFIP.

State

Department of Water Resources

The major responsibilities of the California DWR include preparing and updating the California Water Plan to guide development and management of the state's water resources; planning, designing, constructing, operating, and maintaining the State Water Resources Development System; regulating dams; providing flood protection; assisting in emergency management to safeguard life and property; educating the public; and serving local water needs by providing technical assistance. In addition, the DWR cooperates with local agencies on water resources investigations, supports watershed and river restoration programs, encourages water conservation,

explores conjunctive use of ground and surface water, facilitates voluntary water transfers, and, when needed, operates a state drought water bank.

Porter-Cologne Water Quality Control Act (California Water Code §13000 et seq.)

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) (Water Code Sections 13000 et seq.), passed in 1969, is the primary statute covering the quality of waters in California and requires protection of water quality by appropriate designing, sizing, and construction of erosion and sediment controls. The Porter-Cologne Act established the SWRCB and divided California into nine regions, each overseen by an RWQCB. The SWRCB is the primary State agency responsible for protecting the quality of the State's surface and groundwater supplies and has delegated primary implementation authority to the nine RWQCBs. The Porter-Cologne Act assigns responsibility for implementing the CWA Sections 401 through 402 and 303(d) to the SWRCB and the nine RWQCBs. The Porter-Cologne Act requires the development and periodic review of water quality control plans (basin plans) that designate beneficial uses of California's major rivers and groundwater basins and establish narrative and numerical water quality objectives for those waters, provide the technical basis for determining waste discharge requirements, identify enforcement actions, and evaluate clean water grant proposals. The basin plans are updated every three years. Compliance with basin plans is primarily achieved through the implementation of the NPDES, which regulates waste discharges as previously discussed. The Porter-Cologne Control Act requires that any person discharging waste or proposing to discharge waste within any region, other than to a community sewer system, which could affect the quality of the "waters of the State" file a report of waste discharge. Absent a potential effect on the quality of "waters of the State," no notification is required. However, the RWQCB encourages the implementation of BMPs similar to those required for NPDES stormwater permits to protect the water quality objectives and beneficial uses of local surface waters.

Streambed Alteration Agreement (California Fish and Game Code)

California Fish and Game Code Section 1602 protects the natural flow, bed, channel, and bank of any river, stream, or lake designated by the California Department of Fish and Wildlife (CDFW) in which there is, at any time, any existing fish or wildlife resources, or benefit for the resources. Section 1602 applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the state, and requires any person, state or local governmental agency, or public utility to notify the CDFW before beginning any activity that would:

- Substantially divert or obstruct the natural flow of any river, stream or lake;
- Substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or
- Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

If it is determined during final engineering and design of a project that any project-related actions would have the potential to necessitate a streambed alteration agreement, such an agreement would be prepared and implemented prior to construction of the project, thus maintaining compliance with

Section 1602 of the California Fish and Game Code. A streambed alteration agreement is required if the CDFW determines the activity could substantially adversely affect an existing fish and wildlife resource. The agreement includes measures to protect fish and wildlife resources while conducting the project. The CDFW must comply with the California Environmental Quality Act (CEQA) before it may issue a final lake or streambed alteration agreement; therefore, the CDFW must wait for the lead agency to fully comply with CEQA before it may sign the draft lake or streambed alteration agreement, thereby making it final.

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act of 2014 (SGMA), effective January 1, 2015, authorizes local agencies to manage groundwater in a sustainable manner and allows limited state intervention when necessary to protect groundwater resources. The SGMA requires the creation of a Groundwater Sustainability Agency (GSA) that would develop and implement a Groundwater Sustainability Plan (GSP) to manage and use groundwater in a manner that can be maintained during the planning and implementation horizon without undesirable results, defined as follows:

1) Chronic lowering of groundwater levels, indicating a significant and unreasonable depletion of supply;
2) Significant and unreasonable reduction of groundwater storage;
3) Significant and unreasonable seawater intrusion;
4) Significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies;
5) Significant and unreasonable land subsidence that substantially interferes with surface land uses; and
6) Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water.

The DWR has determined that processed water generated by oil and gas production is not groundwater. A comprehensive, detailed record of the groundwater in the Kern County basins that includes both the project and cumulative projects, and the Sustainable Groundwater Management Act plans are provided in Section 4.9, *Hydrology and Water Quality* of the Kern County Oil and Gas Supplemental Recirculated Environmental Impact Report (SREIR) (2020/2021).

The Subbasin is designated as a high-priority and critically over-drafted basin due to groundwater pumping in excess of recharge. The WDWA is the GSA for the portion of the Subbasin where the project is located and is a member agency of the KGA, was formed by a Joint Powers Agreement between 16 member agencies to function as the GSA for the overall Subbasin. WDWA developed a “Chapter” GSP (WDWA 2020) under the KGA “Umbrella” GSP (KGA 2022) to meet the regulatory requirements of SGMA. Additionally, the project proposes to use water from the BVWSD, which has prepared its own GSP (BVWSD 2020).

On March 2, 2023, the DWR issued a determination that the KGA Umbrella GSP (and associated Chapter GSPs) is inadequate, shifting responsibility for the GSP to the SWRCB. This decision permits, but does not require, the State Water Board to intervene, such as by designating the basin as probationary after at least 90 days' notice and a public hearing; such a designation would subject many groundwater extractors to certain fees and reporting requirements. If the GSA fails to remedy deficiencies within one year following a probationary designation, the State Water Board could then choose to develop an interim GSP until the GSA adopts an adequate plan of its own. In the meantime, the current GSP remains effective.

The SGMA allows for multiple GSPs implemented by multiple GSAs and coordinated pursuant to a single coordination agreement that covers the entire basin to be an acceptable planning scenario (Water Code § 10727). In the San Joaquin Valley-Kern County Subbasin (Subbasin), six GSPs were prepared by 17 GSAs for the various management areas established in the Subbasin pursuant to the coordination agreement and submitted to the California DWR for review. Collectively, the six GSPs and the coordination agreement are referred to as the Plan for the Subbasin. Individually, the GSPs include the following:

- Kern Groundwater Authority Groundwater Sustainability Plan–Amended July 2022, prepared by the KGA GSA, Semitropic Water Storage District GSA, Cawelo Water District GSA, City of McFarland GSA, Pioneer GSA, WKWD GSA, and WDWA GSA
- Amended Kern River Groundwater Sustainability Plan, July 2022, prepared by the Kern River GSA and Greenfield County Water District GSA
- Buena Vista Water Storage District GSA Groundwater Sustainability Plan, July 2022, prepared by the Buena Vista Water Storage District GSA
- Olcese Groundwater Sustainability Agency Groundwater Sustainability Plan, July 2022, prepared by the Olcese Water District GSA
- Henry Miller Water District Groundwater Sustainability Plan, July 2022, prepared by the Henry Miller Water District GSA
- South of Kern River Groundwater Sustainability Plan, July 2022, prepared by the Arvin GSA, Tejon-Castac Water District GSA
- Wheeler Ridge-Maricopa GSA

On March 2, 2023, the DWR deemed the six GSPs inadequate for the following deficiencies:

- Deficiency 1 involved how the Plan for the Subbasin established and justified undesirable results that represent effects caused by groundwater conditions occurring throughout the Subbasin.
- Deficiency 2 involved the establishment of minimum thresholds for the chronic lowering of groundwater levels.
- Deficiency 3 involved the establishment of sustainable management criteria for land subsidence.

These findings are based on all uses of groundwater in the region and not specific to oil and gas production.

Under the SGMA, the groundwater authorities are required to begin implementation of the plans, although found inadequate, while working to amend the plans and address the deficiencies.

Senate Bill 4 (Well Stimulation Treatment)

Section 1421(d) of the federal SDWA excludes "the underground injection of fluids or propping agents (other than diesel fuels) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities" from regulation under the UIC program. Effective January 1, 2014, California adopted several new and amended provisions of the Public Resources Code and Water Code to regulate any oil or gas well stimulation activity designed to enhance oil or gas production or recovery by increasing the permeability of the geologic formation that contains hydrocarbon deposits. Well stimulation activities covered by the new legislation include hydraulic fracturing and acid well stimulation treatments. The legislation, commonly referred to as Senate Bill (SB) 4, amended Sections 3213, 3215, 3236.5, and 3401 and added Article 3 to Chapter 1 of Division 3 of the Public Resources Code, and added Section 10783 to the Water Code. SB 4 requires that the California Geologic Energy Management Division (CalGEM) (1) promulgate emergency interim and adopt permanent regulations regulating well stimulation treatments by January, 2015, to take effect no later than July 1, 2015; (2) complete a statewide EIR on well stimulation treatments by July 2015; (3) complete an independent scientific study of well stimulation by January 2015; and (4) consult and reach formal agreements with other regulatory agencies to provide regulatory accountability for, and public transparency to, well stimulation treatments by January 2015. SB 4 also requires that the SWRCB develop model criteria for oil and gas-related groundwater monitoring by July 2015. The regulations, studies, and interagency agreements required by SB 4 are intended to regulate water quality and potential geological hazards that could be associated with well stimulation, such as earthquakes or ground instability resulting from bedrock fracturing or acidization. Geology and soils regulatory requirements associated with SB 4 are described in further detail in Section 4.6, *Geology and Soils,* of the 2015 Final (FEIR) (SREIR Volume 3).

Since SB 4 was enacted, CalGEM has developed an online tracking tool, WellStar, to locate well stimulation notices and information required by the applicable regulations. According to CalGEM, the state's Well Stimulation Treatment (WST) regulations "increase operational transparency; reporting requirements, including disclosure of WST fluid chemicals; and neighbor notification with the opportunity for neighbors to seek baseline water quality testing. They require an extensive engineering review and well integrity evaluation for groundwater protection and seismic monitoring. This includes a stoppage for evaluation should any earthquake greater than magnitude 2.7 near a stimulation operation occur. The SWRCB also must review all proposed projects to determine whether groundwater monitoring is required" (CalGEM 2023a). In November 2019, CalGEM requested that the Lawrence Livermore National Laboratory (LLNL) conduct a third-party scientific review of pending well stimulation permit applications to ensure the state's technical standards for public health, safety, and environmental protection are met prior to approval of each permit. The LLNL also evaluated the completeness of WST operators' application materials

and CalGEM's engineering and geologic analyses. CalGEM states that the review is "taking place as an interim measure while a broader audit is completed of CalGEM's permitting process for well stimulation. That audit is being completed by the Department of Finance Office of Audits and Evaluation (OSAE) and will be completed and shared publicly. LLNL experts are continuing evaluation on a permit-by-permit basis and conducting a rigorous technical review to verify geological claims made by well operators in the application process. Permit by permit review will continue until the Department of Finance Audit is complete" (CalGEM 2023b).

The SB 4 regulations require completion of certain physical well inspections, documentation, and public notices and disclosures prior to and after completing a well stimulation process. The proposed regulations define well stimulation to include "a treatment of a well designed to enhance oil and gas production or recovery by increasing the permeability of the formation. Well stimulation is a short-term and non-continual process for the purposes of opening and stimulating channels for the flow of hydrocarbons. Examples of well stimulation treatments include hydraulic fracturing, acid fracturing, and acid matrix stimulation" (14 California Code of Regulations [CCR] §1761(a)(1)(A)). This definition "does not include routine well cleanout work; routine well maintenance; routine treatment for the purpose of removal of formation damage due to drilling; bottom hole pressure surveys; routine activities that do not affect the integrity of the well or the formation; the removal of scale or precipitate from the perforations, casing, or tubing; a gravel pack treatment that does not exceed the formation fracture gradient; or a treatment that involves emplacing acid in a well and that uses a volume of fluid that is less than the Acid Volume Threshold for the operation and is below the formation fracture gradient" (14 CCR §1761(a)(1)(B)).

Each well operator must obtain a permit from CalGEM in advance of performing a WST and must submit an application that includes the identification and location of the well, the time period during which the WST is planned to occur, a water management plan, a list of the anticipated identity and concentration of the chemical constituents of the WST fluids the operator plans to use, modeling of the WST axial dimensional stimulation area and identification of plugged and abandoned wells and geologic faults within the modeled treatment area, indication that the operator is developing a groundwater monitoring plan that meets the criteria of the applicable RWQCB (operations cannot commence unless a plan has been approved), an estimate of treatment-generated waste materials that are not addressed in the water management plan, identification and contact information of the operator, the depth of the base of fresh water, the results of specified evaluation and modeling, and casing designs (14 CCR §§1783, 1783.1, 1784).

Once CalGEM deems an application complete, a well operator must hire an independent entity or person to provide notification to every tenant and owner of neighboring property within a specified distance from the wellhead and horizontal projection of the applicable well at least 30 days prior to commencing a WST. Notified property owners may request baseline and follow-up water quality testing of their domestic and/or agricultural well(s) at the operator's expense, and prior notice of any such testing must be provided to the applicable RWQCB to allow for the opportunity to observe the water sampling process. Well operators must also pressure test a well and meet certain integrity requirements prior to commencing a WST. An operator may conduct the stimulation activity identified in an approved application and notice within one year of CalGEM's approval (14 CCR §§1783.2-1783.3).

The regulations require that, prior to conducting well stimulation, an operator must perform a pressure test after all facilities that could be affected by a proposed well stimulate are in place (14 CCR §1784.1). In addition, a cement evaluation or remediation procedure must be performed to ensure that the cement outside of the well production casing meets applicable regulatory requirements and is sufficient to ensure the geologic and hydrologic isolation of the oil and gas formation during and following the WST (14 CCR §1784.2).

The regulations require the operator to monitor the surface injection pressure, slurry rate, proppant concentration, fluid rate, and pressure of each annulus of the well during a WST. The operator must terminate the WST, report the incident to CalGEM, and conduct diagnostics if certain performance and pressure thresholds are exceeded. Notices of any termination must be provided to CalGEM and other state agencies, including the RWQCB (14 CCR §1785). Finally, the proposed regulations require operators to perform ongoing monitoring of a well after a stimulation treatment and immediately inform CalGEM and the RWQCB, conduct diagnostics, and take all appropriate measures to prevent contamination of protected water or loss of hydrocarbon resources. Tracking of seismic activity during and after WST must be performed using the California Integrated Seismic Network and requires evaluation if an earthquake larger than magnitude 2.7 occurs within the vicinity of a WST (14 CCR §1785.1). Materials used in well stimulation are subject to storage, handling, and reporting requirements (14 CCR §1786). Well monitoring must be performed after each WST is completed, including pressure data and diagnostic testing, to verify that the well has not been breached (17 CCR §1787).

Each well operator must disclose within 60 days after a WST is completed any information regarding the source, volume, and composition and disposition of well stimulation fluids, including hydraulic fracturing fluids, acid well stimulation fluids, and flowback fluids (14 CCR §1788). The disclosures are provided to CalGEM and must be available online in a format that allows for searching and aggregating the information. A well stimulation treatment report must also be filed with CalGEM, including any information concerning stimulation treatments that differ from what was anticipated in the well stimulation treatment design submitted to CalGEM under Section 1784(b) and whether the actual location of the WST differs from what was indicated in the stimulation permit application. Effective December 11, 2020, the public can use WellSTAR to find information about well stimulation treatment permits, well stimulation disclosures, well maintenance data, well records, and UIC projects.

Local

Kern County General Plan

Construction and operation of the proposed project would be subject to policies and regulations contained within the general plans including the KCGP, Kern County Zoning Ordinance, and the Kern County Code of Building Regulations, which include policies, goals, and implementation measures related to hydrology and water quality. The policies and implementation measures in the KCGP related to hydrology and water quality applicable to the project are provided in this section. The KCGP contains additional policies, goals, and implementation measures that are more general in nature and not specific to development, such as the project. These measures are not listed below,

but as stated in Chapter 2, *Introduction*, all policies, goals, and implementation measures in the KCGP are incorporated by reference.

The project site is located within the KCGP area and, therefore, would be subject to applicable policies and measures of the KCGP. The Land Use, Conservation, Open Space Element, and the Safety Element of the KCGP include goals, policies, and implementation measures related to hydrology and water quality that apply to the project, described as follows.

Chapter 1. Land Use, Conservation, and Open Space Element

1.3. Physical and Environmental Constraints

Policies

Policy 1. Kern County will ensure that new developments will not be sited on land that is physically or environmentally constrained ((Map Code 2.1 (Seismic Hazard), Map Code 2.2 (Landslide), Map Code 2.3 (Shallow Groundwater), Map Code 2.5 (Flood Hazard), Map Codes from 2.6 – 2.9, Map Code 2.10 (Nearby Waste Facility), and Map Code 2.11 (Burn Dump Hazard)) to support such development unless appropriate studies establish that such development will not result in unmitigated significant impact.

Policy 8. Encourage the preservation of the floodplain's flow conveyance capacity, especially in floodways, to be open space/passive recreation areas throughout the County.

Policy 9. Construction of structures that impede water flow in a primary floodplain will be discouraged.

Policy 10. The County will allow lands which are within flood hazard areas, other than primary floodplains, to be developed in accordance with the General Plan and Floodplain Management Ordinance, if mitigation measures are incorporated so as to ensure that the proposed development will not be hazardous within the requirements of the Safety Element (Chapter 4) of this General Plan.

Policy 11. Protect and maintain watershed integrity within Kern County.

Implementation Measures

Implementation Measure H. Development within areas subject to flooding, as defined by the appropriate agency, will require necessary flood evaluations and studies.

Implementation Measure J. Compliance with the Floodplain Management Ordinance prior to grading or improvement of land for development or the construction, expansion, conversion or substantial improvements of a structure is required.

Implementation Measure N. Applicants for new discretionary development should consult with the appropriate Resource Conservation District and the California Regional Water Quality Control Board regarding soil disturbances issues.

1.4. Public Facilities and Services

Goals

Goal 9. Serve the needs of industries and Kern County residents in a manner that does not degrade the water supply and the environment and protect the public health and safety by avoiding surface and subsurface nuisances resulting from the disposal of hazardous wastes, irrespective of the geographic origin of the waste.

1.9. Resource

Policy 11. Minimize the alteration of natural drainage areas. Require development plans to include necessary mitigation to stabilize runoff and silt deposition through utilization of grading and flood protection ordinances.

Implementation Measures

Implementation Measure C. The County Planning Department will seek review and comment from the County Public Works Department, Engineering and Survey Services Division on the implementation of the National Pollution Discharge Elimination System for all discretionary projects.

1.10. General Provisions

Implementation Measures

Implementation Measure E: All new discretionary development projects shall be subject to the Standards for Sewage, Water Supply and Preservation of Environmental Health Rules and Regulations administered by the County's Public Health Services Department. Those projects having percolation rates of less than five minutes per inch shall provide a preliminary soils study and site-specific documentation that characterize the quality of upper groundwater in the alternative septic systems would adversely impact groundwater quality. If the evaluation indicated that the uppermost groundwater at the proposed site already exceeds groundwater quality objectives of the Regional Water Quality Control Board or would if the alternative septic system is installed, the applicant would be required to supply sewage collection, treatment, and disposal facilities.

1.10.6. Surface Water and Groundwater

Policies

Policy 34. Ensure that water quality standards are met for existing users and future development.

Policy 39. Encourage the development of the County's groundwater supply to sustain and ensure water quality and quantity for existing users, planned growth, and maintenance of the natural environment.

Policy 40. Encourage utilization of community water system rather than the reliance on individual wells.

Policy 41. Review development proposals to ensure adequate water is available to accommodate projected growth.

Policy 43. Drainage shall conform to the Kern County Development Standards and the Grading Ordinance.

Policy 44. Discretionary projects shall analyze watershed impacts and mitigate for construction-related and urban pollutants, as well as alterations of flow patterns and introduction of impervious surfaces as required by the California Environmental Quality Act (CEQA), to prevent the degradation of the watershed to the extent practical.

Implementation Measures

Implementation Measure Y. Promote efficient water use by utilizing measures such as:

i. Requiring water-conserving design and equipment in new construction.

ii. Encouraging water-conserving landscaping and irrigation methods.

iii. Encouraging the retrofitting of existing development with water-conserving devices.

4.5. Landslides, Subsidence, Seiche, and Liquefaction

Policies

Policy 3. Reduce potential for exposure of residential, commercial, and industrial development to hazards of landslide, land subsidence, liquefaction, and erosion.

Implementation Measures

Implementation Measure B. Require liquefaction investigations in all areas of high groundwater potential and appropriate foundation design to mitigate potential damage to buildings on sites with liquefaction potential.

Implementation Measure D. Discretionary actions will be required to address and mitigate impacts from inundation, land subsidence, landslides, high groundwater areas, liquefaction and seismic events through the CEQA process.

Kern County Code of Building Regulations

Kern County Grading Ordinance (17.28)

Chapter 17.28 Kern County Grading Code. Requirements of the Kern County Grading Code will be implemented. A grading permit will be obtained prior to commencement of construction activities. Of particular note with respect to hydrology and water quality is Section 17.28.140, Erosion Control, which addresses the following:

Slopes. The faces of cut and fill slopes shall be prepared and maintained to control against erosion. This control may consist of effective planting. The protection for the slopes shall be installed as soon as practicable and prior to calling for final approval. Where cut slopes are not subject to erosion due to the erosion-resistant character of the materials, such protection may be omitted.

Other Devices. Where necessary, check dams, cribbing, riprap, or other devices or methods shall be employed to control erosion and provide safety.

Temporary Devices. Temporary drainage and erosion control shall be provided as needed at the end of each work day during grading operations, such that existing drainage channels would not be blocked. Dust control shall be applied to all graded areas and materials and shall consist of applying water or another approved dust palliative for the alleviation or prevention of dust nuisance. Deposition of rocks, earth materials, or debris onto adjacent property, public roads or drainage channels shall not be allowed.

Floodplain Management

Kern County has adopted a Floodplain Management Ordinance (Chapter 17.48 of the Building and Construction Code) that applies to "any man-made change to improved or unimproved real estate, including buildings or other structures, mining, dredging, filling, grading, paving, excavation, drilling operations, or storage of equipment or materials." The purposes of the ordinance include the promotion of "public health, safety, and general welfare, and to minimize public and private losses due to flood conditions" and compliance "with the requirements of the NFIP Regulations." Among other implementation measures, the ordinance (1) restricts or prohibits certain uses that are susceptible to flood damage or increase erosion and flood heights or velocities; (2) requires that uses vulnerable to floods be protected against flood damage at the time of initial construction; (3) controls the alteration of natural floodplains, stream channels, and natural protective barriers that accommodate or channel flood waters; (4) controls filling, grading, dredging, and other development that may increase flood damage; and (5) prevents or regulated the construction of flood barriers that would unnaturally divert flood waters or may increase flood hazards in other areas.

Kern County Development Standards

The Kern County Development Standards apply to all developments within Kern County that are outside of incorporated cities. These standards establish minimum design and construction requirements that would result in improvements that are economical to maintain and would adequately serve the general public. The requirements set forth in these standards are considered minimum design standards and would require the approval of the entity that would maintain the facilities to be constructed prior to approval by the County.

Kern County Water Quality Control Plan

Each of the nine RWQCBs adopts a water quality control plan that recognizes and reflects regional differences in existing water quality, the beneficial uses of the region's groundwater and surface waters, and local water quality conditions and problems. Water quality problems in the regions are

listed in these plans, along with the causes if they are known. Each RWQCB is to set water quality objectives that would ensure the reasonable protection of beneficial uses and the prevention of nuisance, with the understanding that water quality can be changed somewhat without unreasonably affecting beneficial uses.

The Kern County Public Works Department requires the completion of an NPDES applicability form for all construction projects disturbing one or more acre within Kern County. This form requires the project proponent to provide background information on construction activities. Project proponents must apply for the permit under one of the following four conditions:

1) All stormwater is retained on site and no stormwater runoff, sediment, or pollutants from on-site construction activity can discharge directly or indirectly off site or to a river, lake, stream, municipal storm drain, or off-site drainage facilities.

2) All stormwater runoff is not retained on site but does not discharge to a water of the United States (such as, drains to a terminal drainage facility). Therefore, a SWPPP has been developed and BMPs must be implemented.

3) All stormwater runoff is not retained on site, and the discharge is to a water of the United States. Therefore, a Notice of Intent (NOI) must be filed with the SRWRCB prior to issuance of the building permit. Also, a SWPPP has been developed and BMPs must be implemented.

4) Construction activity is between 1 to 5 acres and an Erosivity Waiver was granted by the SWRCB. BMPs must be implemented.

Kern County – Applicability of NPDES Program for a Project Disturbing 1 Acre or Greater

As closed systems that never contact the ocean or other waters of the United States, many of the waters within Kern County are technically not subject to protective regulations under the federal NPDES Program. The Kern County Public Works Department requires the completion of an NPDES applicability form for projects with construction activities disturbing one or more acres and requires the project proponent to provide information about construction activities and to identify whether stormwater runoff has the potential of discharging into waters of the United States, waters of the State, or a terminal drainage facility. The purpose of the form is to identify which water quality protection measure requirements apply to different projects (if any). Should stormwater runoff be contained on-site and not discharge into any waters, no special actions are required. Should stormwater runoff discharge into waters of the United States, compliance with the SWRCB Construction General Permit SWPPP requirements is required. Should stormwater runoff not be contained on site and drain to waters of the State or a terminal drainage facility, the project proponent would be required to develop a SWPPP and BMPs.

4.10.4 Impacts and Mitigation Measures

Methodology

This section analyzes impacts on hydrology and water quality from the implementation of the project based on changes to the environmental setting as described above. The project's potential impacts on hydrology and water quality have been evaluated using the Aquatic Resources Delineation Report (Appendix C-2), Preliminary Hydrology Study (Appendix H-1), UIC Permit Application (Appendix F-2), and Water Supply Assessment (Appendix H-2) of this EIR. Additionally, a variety of resources, including multiple online sources, published documents, the KCGP, and professional judgment, impacts were analyzed according to CEQA significance criteria described below.

Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist identify the following criteria, as established in Appendix G of the CEQA Guidelines, to determine if a project could potentially have a significant adverse effect on hydrology and water quality.

A project could have a have a significant impact on hydrology and water quality if it would:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which would:
    - (i) result in a substantial erosion or siltation on- or off-site;
    - (ii) substantially increase the rate of amount of surface runoff in a manner which would result in flooding on- or off-site;
    - (iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
    - (iv) impede or redirect flood flows.
- Result in a flood hazard, tsunami, seiche zones, risk release of pollutants due to project inundation.
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Project Impacts

Impact 4.10-1: Violate Water Quality Standards or Waste Discharge Requirements, or Otherwise Substantially Degrade Surface or Groundwater Quality

Water quality standards and waste discharge requirements could be violated if the project releases polluted discharges into receiving waters without a permit. Polluted discharges can generate polluted stormwater runoff (such as, water generated during storm events) or dry weather runoff (such as, water generated during activities such as dust control). Polluted discharge can consist of sediment from erosion, pollutants from herbicides or pesticides applied to agricultural lands or vegetation, or pollutants from construction equipment, such as oil drippings or accidental spills of petroleum hydrocarbons.

As described above in Section 4.10.2, *Environmental Setting*, potential jurisdictional aquatic features observed in the project area include sections of Chico Martinez Creek, remnants of ephemeral streams, and various drainage ditches. There are no anticipated permanent impacts on potentially jurisdictional aquatic features; however, temporary impacts on potentially jurisdictional aquatic features within the project area would occur (Appendix C-2). See Section 4.4, *Biological Resources*, of this EIR for further discussion of potential impacts on aquatic resources.

Construction

Project construction would include clearing, mowing, excavating, and grading portions of the project site. Due to the relatively flat terrain of the site, it is anticipated that grading would be limited throughout the project site to achieve an elevation for final grading. The use of heavy equipment such as earthmovers, scrapers, excavators, dozers, water trucks, paddlewheels, haul vehicles, and graders would likely be used in site preparation. In addition, on-site trenching would be required. These activities have the potential to affect current drainage patterns and erosion on the project site, and soils could become exposed to high winds or heavy precipitation causing a substantial increase in sedimentation in stormwater runoff. However, designing the site grading and access roads in compliance with County of Kern (County) standards would prevent substantial alterations to drainage patterns and erosion within the project site.

Potential impacts on water quality from erosion and sedimentation are expected to be localized and temporary during construction. Stormwater runoff from the project site would not discharge to waters of the United States since the project area is within a watershed that is not hydrologically connected to a navigable waterway. However, because the proposed project would disturb more than 1 acre of ground disturbance the proposed project would be required by the NPDES Construction General Permit to implement a SWPPP during construction. Per Mitigation Measure (MM) 4.10-1 and MM 4.10-2, the SWPPP would include BMPs designed to prevent the occurrence of soil erosion and discharge of other construction-related pollutants that could contaminate water quality and would be applicable to all areas of the project. In addition, prior to the commencement of construction activities, the project proponent would be required to adhere to the requirements of the Kern County Grading Code. This includes the implementation of various measures designed to

prevent erosion and control drainage on-site, thereby further preventing the potential sedimentation and subsequent degradation of stormwater.

During project construction, any activity that results in the accidental release of hazardous or potentially hazardous materials could result in water quality degradation. Materials that could contribute to this impact include petroleum products (for example, gasoline, diesel, and motor oil), automotive fluids (for example, antifreeze, lubricant oils, transmission fluid, and hydraulic fluids), cement slurry, and other fluids utilized by construction vehicles and equipment. Motorized equipment could leak hazardous materials due to inadequate or improper maintenance, unnoticed or unrepaired damage, improper refueling, or operator error. The mobilization of sediment or inadvertent spills or leaks of such pollutants could affect the quality of runoff water from construction activities.

As noted in Section 4.9, *Hazards and Hazardous Materials*, of this EIR, MM 4.9-1 would require the project proponent to provide a Worker Environmental Awareness Program that would describe proper handling, storage, transport, and disposal techniques; describe methods to be used to avoid spills and minimize impacts in the event of a spill; describe procedures for handling and disposing of unanticipated hazardous materials encountered during construction; and establish public and agency notification procedures for spills and other emergencies, including fires. MM 4.10-1 and MM 4.10-2 identify additional guidance for the safe handling and use of these materials, which is guided by the NPDES Construction General Permit and SWPPP. The measures identify protocols regarding the handling of these types of materials should a spill or release occur. Therefore, with the implementation of MM 4.10-1, MM 4.10-2, and MM 4.9-1, impacts on water quality would be less than significant during construction.

Operation

The project includes the operation of a carbon capture and storage field, associated injection wells, and related improvements for the storage of CO_2. The majority of the site would be occupied by capture, compression, and pumping facilities and associated infrastructure, and would not substantially alter the drainage patterns of the site. Due to the largely flat contours of the project site, runoff from rainwater would drain naturally and most water would infiltrate the ground surface. While some rainfall from the margins of the site could flow off-site via sheet flow, effects would be minimal and the potential for substantial erosion that could occur under concentrated runoff conditions is considered low. Nonetheless, where potential for channel erosion exists, BMPs would be implemented to prevent surface flows from becoming concentrated.

To further minimize the potential for degradation of water quality, the project site's engineering and design plans would comply with the most recent requirements of the Kern County Code of Building Regulations. This includes provisions to minimize runoff and erosion leading to potential degradation of downstream receiving waters or other off-site areas. Prior to the commencement of construction activities, the applicant would be required to prepare and submit drainage plans to the Kern County Engineering and Survey Services Department. This would include post-construction structural and nonstructural BMPs.

Upon completion of all construction activities, the project proponent would ensure that the facility would be properly operated and maintained. Routine maintenance would be completed annually and may include, but is not limited to, checking parts for wear and replacing as required. Operation and maintenance personnel would also inspect access roads, crane pads, and trenched areas regularly and maintain them to ensure minimal erosion. Therefore, the project would require limited use of certain hazardous materials for routine operations and maintenance. Accidental release of such materials could result in water quality degradation should the materials become entrained in stormwater. This would result in a potentially significant impact on water quality. However, as described above, implementation of MM 4.9-1 (see Section 4.9, *Hazards and Hazardous Materials*) would provide a Worker Environmental Awareness Program that would ensure the safe handling of hazardous materials on site and provide the means for prompt cleanup in the event of an accidental hazardous material release.

The project would take local industrial sources of CO_2 that are transported via a facility pipeline network to the dedicated injection wells that are constructed through geologically confined reservoirs for storage in perpetuity. The Belridge oilfields have been identified as a location suitable for such storage due to the faults and folds that serve as restrictive structures combined with the numerous thick confining layers (Lower and Upper Santos Shale, as well as the Media Shale), and monitoring zones (Agua Sandstone), which form geologic barriers to usable groundwater sources.

Geotechnical studies and modeling for the project area (Appendix E-1) demonstrate lateral confinement from USDWs is primarily achieved through pressure containment. Injected fluids are expected to flow towards low-pressure areas and into the currently unsaturated zones in both the Upper and Lower Tulare formations. Furthermore, there are no records of water supply wells within the Area of Review. Two potential USDWs were identified, with most of the area either dry or the water contains solid concentrations exceeding acceptable USDW limits. The lowermost potential USDW is separated from the proposed injection zone by more than 7,000 feet of strata, including many confining zones. Therefore, the injection of CO_2 associated with the development of the proposed storage complex is not expected to impact the groundwater quality of potential USDWs.

Per MM 4.10-4 and MM 4.10-5, the UIC program would prevent discharge into any underground source of current or future beneficial use groundwater. Injection of CO_2 into the ground via injection well would not mix with or contaminate groundwater. Therefore, the operation of the project would not violate water quality standards, waste discharge requirements, or degrade surface or water quality in the area.

Conformance to these measures and implementation of MM 4.9- 1, MM 4.10-1, MM 4.10-2, MM 4.10-3, MM 4.10-4, and MM 4.10-5 would minimize long-term impacts on drainage patterns and water quality across the project site that could result in substantial erosion and siltation on- or off-site. Therefore, impacts would be less than significant.

Mitigation Measures

Implementation of MM 4.9-1 would be required (see Section 4.9, *Hazards and Hazardous Materials*, for full mitigation measure text). Additionally, MM 4.10-1 through MM 4.10-5 would be required.

MM 4.10-1 The owner/operator shall comply with all applicable federal, state, regional and local agency water quality protection laws and regulations, and commonly utilized industry standards, including (where applicable) obtaining coverage under the stormwater construction general permit and industrial general permit issued by the State Water Resources Control Board (SWRCB) and complying with industry stormwater management standards for construction and operational activities. The owner/operator shall obtain Class VI Underground Injection Control (UIC) permit(s) for all new or converted CO_2 wells from the EPA UIC program and fully comply with all requirements.

MM 4.10-2 The project shall comply with the following:

a. In areas subject to National Pollutant Discharge Elimination System stormwater permitting requirements, project owner/operators shall file a Notice of Intent to the State Water Resources Control Board to comply with the statewide General Permit for Discharges of Stormwater Associated with Construction Activities (Construction General Permit State Water Resources Quality Control Board Order No 2009-009-DWO) (as such permit may be amended, revised or superseded) prior to undertaking all ground-disturbing activities greater than one acre and shall prepare and implement a Stormwater Pollution Prevention Plan for construction activities on the Project site in accordance with the Construction General Permit. For facilities requiring coverage under the Construction General Permit, the site-specific Stormwater Pollution Prevention Plan shall include measures to achieve the following objectives: (1) all pollutants and their sources, including sources of sediment associated with construction activity are controlled; (2) all non-stormwater discharges are identified and either eliminated, controlled and treated, (3) site Best Management Practices are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges from construction activity and (4) stabilization Best Management Practices to reduce or eliminate pollutants after construction are completed. The Stormwater Pollution Prevention Plan shall be prepared by a qualified preparer and shall include the minimum Best Management Practices required for the identified risk level. The Stormwater Pollution Prevention Plan shall include a construction site monitoring program that identified requirements for dry weather visual observations of pollutants at all discharge locations and, as applicable, depending on the project risk level, sampling of site effluent and receiving waters. A qualified Stormwater Pollution Prevention Plan practitioner shall be responsible for implementing and all monitoring for the Best Management Practices as well as all inspection, maintenance and repair activities at the project site. If applicable, each project shall also implement and fully comply with the Industrial Storm Water Permit (Order No 97-03-DWO) and Kern County Municipal Stormwater Permit (Order No 5-01-

120). All plans under these requirements shall be submitted to Kern County Public Works for review and approval.

Any change to this State Water Regional Control Board determination will require full compliance with National Pollutant Discharge Elimination System requirements.

b. Any operator not subject to National Pollutant Discharge Elimination System stormwater permitting requirements shall implement Best Management Practices during construction and operation. All selected practices shall be shown on a drainage implementation plan and self-certified as complete by a licensed professional qualified in drainage and flood control issues. The plan shall be submitted to the Kern County Planning and Natural Resources Department. The following Best Management Practices shall be implemented and shown on the drainage implementation plan:

    1. Utilizing established facilities design and construction standards as applicable (e.g., American Society for the Testing and Materials (ASTM) American Petroleum Institute (API).
    2. Implementing good housekeeping and maintenance practices:
        i. Preventing trash, waste materials and equipment from construction stormwater.
        ii. Maintaining wellheads, compressors, tanks and pipelines in good condition without leaks or spills.
        iii. Designing and maintaining graded pads to not actively erode and discharge sediment.
        iv. Maintaining vehicles in good working order.
        v. Providing secondary containment for all aboveground storage tanks and maintaining such containment features in good operating condition.
    3. Implementing spill prevention and response measures:
        i. Utilizing preventative operating practices such as tank level monitoring, safe chemical handling and conducting regular inspections.
        ii. Developing and maintaining a spill response plan.
        iii. Conducting spill response training for employees and have a process to ensure contractors have the necessary training.
        iv. Maintaining spill response equipment on-site.
    4. Implementing material storage and management practices:
        i. Preventing unauthorized access
        ii. Utilizing “run-on” and “run-off” control berms and swales.
        iii. Stabilizing exposed slopes through vegetation and other standard slope stability methods.

b. The CCS project shall comply with all applicable state, federal and local stormwater management laws. Prior to construction or grading, the owner/operator shall submit a drainage and flood study plan to the Kern County Public Works -Floodplain division for review and approval.

The owner/operator shall prepare a drainage plan that complies with requirements to address runoff and the potential for impeding or redirecting 100-year flood flows. The drainage plan shall be prepared in accordance with the Kern County Grading Ordinance, Kern County Green Code, Development Standards and approved by the Kern County Department of Public Works, Floodplain Management Section. The drainage plan shall specify best management practices to prevent all construction pollutants from contacting stormwater, with the intent of keeping sedimentation or any other pollutants from moving off site and into receiving waters. The requirements of the Plan shall be incorporated into design specifications. Recommended best management practices for the construction phase must be shown on a drainage plan, and shall include the following:

1. Erosion Control -

   Scheduling of construction activities to avoid rain events.

   i. Implementing runoff erosion control methods consistent with the drainage plan when vegetation has been removed.

2. Sediment Control -

   i. Secure stockpiling of soil.

   ii. Installation of a stabilized construction entrance/exit and stabilization of disturbed areas.

3. Non-stormwater Control -

   i. Fueling and maintenance of equipment and vehicles shall be managed so as to prevent contamination of runoff from the site.
   ii. Concrete handling techniques shall be consistent with the drainage plan and shall comply with Mitigation Measure 4.14-15 (m).

4. Waste and Material Management -

   i. Managing construction materials, consistent with the drainage plan and designating construction staging areas in or around the Project site.

   ii. Stockpiling and disposing of demolition debris, concrete, and soil in compliance with regulatory requirements and consistent with the drainage plan.

   iii. Prompt removal and disposal of litter.
   iv. Disposal of demolition debris, concrete and soil in compliance with regulatory requirements for solid waste.
   v. Provide and maintain secondary containment to prevent or eliminate pollutants from moving off-site and into receiving waters in compliance with Mitigation Measure 4.8-3.

5. Post-Construction Stabilization -

i. Ensuring the stabilization of all disturbed soils per revegetation or application of a soil binder.

c. If construction activities will alter federal jurisdictional waters, project owner/operators shall comply with the federal Clean Water Act Section 404 and Section 401 permitting and certification requirements. If construction activities will alter state waters, project owner/operators shall comply with California Department of Fish and Wildlife Streambed Alteration requirements.

MM 4.10-3 All drilling operations must either use a closed-loop system to avoid discharges of drilling muds and fluids, or obtain coverage under the SWRCB low-threat discharge General Order (Waste Discharge Requirements General Order 2003-0003-DWQ), obtain individual Waste Discharge Requirements issued by the Central Valley Regional Water Quality Control Board for the unit, or obtain coverage under a general order issued by the Central Valley Regional Water Quality Control Board applicable to drilling ponds. Any surface ponds or sumps must be cleared of fluids and muds in accordance with the State Water Resources Control Board general order, applicable Water Discharge Requirements and Division of Oil Gas and Geothermal Resources regulations. Compliance with the State Water Resources Control Board or Central Valley Regional Water Quality Control Board low-threat discharge orders or Water Discharge Requirements, if closed-loop systems are not used, and applicable laws, regulations and standards will reduce potential surface water quality impacts from contact with drilling muds or fluids during drilling and construction to less than significant levels.

MM 4.10-4 The owner/operator shall not conduct any Class VI injection activity regulated by the UIC program that discharge into any underground source of current or future beneficial use groundwater, including drinking water. The owner/operator must demonstrate compliance with EPA Class VI UIC permit conditions.

MM 4.10-5 The owner/operator shall not discharge produced water into any surface disposal facility unless the facility has received the Waste Discharge Requirements from the Central Valley Regional Water Quality Control Board, or the need for Water Discharge Requirements has been waived by the Central Valley Regional Water Quality Control Board. As required by the SB 4 regulations, well stimulation treatment fluids and produced fluids from wells that have been stimulated cannot be stored, discharged, or disposed into surface ponds or pits.

Level of Significance After Mitigation

Impacts would be less than significant.

Impact 4.10-2: Substantially Decrease Groundwater Supplies or Interfere Substantially with Groundwater Recharge Such That the Project May Impede Sustainable Groundwater Management of the Basin

The project site is in the DWR-designated groundwater Kern County Subbasin. Groundwater sustainability in the subbasin is overseen by the KGA, which has adopted the Kern Groundwater Authority Groundwater Sustainability Plan. The proposed project would use water during construction and for operation of the project. Groundwater from Aera Energy's water system would be used to provide domestic water supplies to the project. The project estimates a water demand of

approximately 400 af surface water deliveries from BWSD from the California Aqueduct. over an approximate three-year construction period. Commercial water demands averaging up to 1,223 acre-feet per year (afy) would be supplied by produced water from the Belridge oilfields, and SWP water would only be used if sufficient water is allocated under Aera Energy's water rights, as described in detail in Section 4.19, *Utilities and Service Systems*. The BWSD imported water supplies would be delivered to the project via the industrial system that is owned and operated by the industrial water users including Aera Energy and other Belridge oilfields field operators. The industrial system consists of a pumping plant at BWSD Turnout No. 5 (Bel 5) on the California Aqueduct, and associated pipeline that conveys untreated SWP and supplemental water to the industrial zone (such as, oil fields) (Stantec 2023c). Project water demands would not substantially deplete the supplies of the local water district (including groundwater).

While the project would result in the conversion of portions of the site to impervious surface areas (for example, well pads, compression, and pumping stations), the project would not substantially impede recharge, thereby reducing groundwater volumes, and impact sustainable groundwater management within the basin either during construction or during operation.

As described above in Subsection 4.10.2, *Environmental Setting*, depth to groundwater within the vicinity of the project site is greater than 50 feet bgs. It is reasonable to assume some groundwater infiltration at the project site during precipitation events because the majority of the project site is currently pervious and consists of open ground. However, the project site is not specifically designated as and does not specifically operate as a groundwater recharge location.

Construction

Proposed construction water demands for the project are anticipated to be purchased from existing BWSD SWP entitlements and other existing long-term water contracts with individuals and delivered to the project area via BWSD's 415 North Canal and/or 500 Canal and existing pipeline. Aera Energy also has approximately 7,000 af of surplus SWP and Kern River water banked in various groundwater banking projects through the BWSD that may be accessed at any time, subject to the groundwater bank's pumping capacity.

The project would require water to be used for utility purposes including fire protection, dust control, grading, compaction, and only used in the process if sufficient water is available under existing water rights. Water usage during construction, primarily for dust suppression purposes, is not anticipated to exceed 400 af over an approximate three-year construction period. The water would be imported water supplies delivered to the project via the industrial system from the California Aqueduct and stored on-site and would not substantially decrease groundwater supplies within the Subbasin, as detailed in Section 4.19, *Utilities and Service Systems*.

Construction would not prevent or inhibit any incidental groundwater recharge that currently occurs on site from precipitation. During construction, the project site would generally remain pervious and would allow any current infiltration that occurs to continue. During the installation of the project components, most rainfall would disperse across their panel surface and fall to the ground surface. This would facilitate infiltration and subsequent groundwater recharge.

While the project would result in the conversion of portions of the site's impervious area, most of the ground surface would remain permeable and enable infiltration. Thus, construction of the project would not substantially reduce groundwater volumes or impede recharge and impact sustainable groundwater management within the basin.

Thus, due to the minimal amount of groundwater needed for construction activities, and the temporary, short-term nature of groundwater extraction required, construction of the project would not be considered water intensive. Thus, the project also would not impede sustainable groundwater management of the basin and impacts would be less than significant.

Operation

The project would include the addition of new impervious surfaces due to the implementation of concrete foundations, resurfacing (concrete) of existing dirt roads, implementation of the proposed CO_2 compression and pumping facility, which includes the control room and parking area, injection wells, and aboveground pipelines. As discussed above, most water falling on the site would runoff and fall to the ground surface and infiltrate.

The proposed facilities would not have the scale or massing to interfere with groundwater recharge in the area. Therefore, the implementation of impervious surfaces and facilities would not impede groundwater management of the Subbasin.

Proposed domestic water demands for the operation of the project are estimated to be 21.72 afy and would be provided by two existing Aera-owned groundwater wells located in the BVWSD. Groundwater would be minimally used as potable water to control rooms, fire/emergency supply as needed, facility housekeeping, and chemical dilution. Commercial water demands would be satisfied through produced water. Therefore, the project would not substantially decrease groundwater supplies or impede sustainable management of the Subbasin. As described in Section 4.19, *Utilities and Service Systems*, the Kern County subbasin, as a whole, has an overdraft of 324,326 afy over the baseline conditions of which the KGA is approximately 239,346 af of the deficit. Should the project require water supplies in excess of the allotment from the District, impacts on water supplies would be considered potentially significant. To address this, MM 4.19-1 would be implemented, ensuring that any groundwater or reclaimed water used is accounted for and regulated. Therefore, with mitigation, the impacts would be less than significant for the project.

Mitigation Measures

Implementation of MM 4.19-1 would be required (see Section 4.19, *Utilities and Service Systems*).

Level of Significance After Mitigation

Impacts would be less than significant.

Impact 4.10-3: Substantially Alter the Existing Drainage Pattern of the Site or Area, Including through the Alteration of the Course of a Stream or River, or through the Addition of Impervious Surfaces, in a Manner That Would:

(i) Result in a Substantial Erosion or Siltation On or Off Site.

The project is located on relatively flat terrain, with the project site situated on varying slopes. There are surface water bodies (creeks, streams, or rivers) within the project area. Additionally, there are surficial drainages throughout the project area that drain in the direction of the natural topography.

Construction

Grading for the project and installation of project facilities would result in minimal changes to the existing on-site drainage patterns and flow paths and minimal alteration of surface topography via ground disturbance and project facilities. Although minimal changes to water flows are anticipated, the project does have the potential to alter drainage patterns such that flooding could be exacerbated on site during a rain event. If the site and drainage plan is not properly designed, this could cause localized flooding during major events within the project site, along the margins of the project area, or in off-site downstream drainage areas.

However, due to the relatively flat nature of the project site, grading is not anticipated to be substantial and would not substantially change the existing drainage patterns. The drainage patterns during both construction and operation would be such that water received on site during rain events and off-site flow that enters the site would continue to flow through the site much as it does currently.

Operation

The project site is relatively flat and would remain so post-construction and the operational-related impacts from erosion or siltation would be less than significant. The project's site engineering and design plans would be required to comply with the most recent requirements of the Kern County Code of Building Regulations. The design and plan review process would ensure that the final grading would conduct site drainage to facilities designed to control runoff.

Lastly, and as discussed above, the project would implement MM 4.10-1 and MM 4.10-2 to reduce long-term impacts on drainage patterns across the project site. Therefore, with mitigation, the impacts would be less than significant for the project.

Mitigation Measures

Implement MM 4.10-1 and MM 4.10-2, as described above.

Level of Significance after Mitigation

Impacts would be less than significant.

(ii) Substantially Increase the Rate of Amount of Surface Runoff in a Manner That Would Result in Flooding On or Off Site

The rate and amount of surface runoff are determined by multiple factors, including topography, the amount and intensity of precipitation, the amount of evaporation that occurs in the watershed, and the amount of precipitation and water that infiltrates to the groundwater. The project would not alter the amount or intensity of precipitation, nor would it require significant amounts of additional water to be imported to the project site.

FEMA has designated the central and southern portions of the project site as Zone A. All other portions of the project site are located in areas designated by FEMA as Zone X, which is an area of minimal flood hazard, and are outside of the 0.2 percent annual chance floodplain.

Construction

Although excavation and grading would occur on portions of the project site, the project site is relatively flat and ground disturbance would not substantially alter the overall topography or flow regime of these areas or the project site. Some areas with vegetation would be removed but would be revegetated and maintained in their existing condition to the greatest extent feasible. This would help facilitate groundwater infiltration minimize surface flow and reduce runoff. Water would be applied to the ground surface during the temporary construction phase, primarily for dust suppression and to reduce erosion from wind and vehicle disturbances. The water would be mechanically and precisely applied and would generally infiltrate or evaporate, which would minimize the potential for uncontrolled runoff from this source.

Accordingly, grading would not substantially alter the existing contours of the site and the existing streams, rivers, or drainages that would be modified by construction activities. Thus, while runoff patterns and concentrations could be altered by grading activities, for the aforementioned reasons, such changes would be minimal and the rate or amount of surface runoff resulting from project construction activities would be similar to the existing condition. Thus, the rate or amount of surface runoff resulting from project construction activities would be similar to the existing condition and the potential for on-site or off-site flooding as a result of project construction is minimal. The potential effects would be further reduced through compliance with design specifications and BMPs required by the Kern County Grading Ordinance and the preparation of a SWPPP, included under MM 4.10-1 and MM 4.10-2.

Operation

Operation of the project would slightly alter the existing drainage pattern on site. Although there are minimal changes to water flows are anticipated, the project does have the potential to alter drainage patterns such that flooding could be exacerbated on site during a rain event. Project facilities and infrastructure would be located within a flood zone designated as a Zone A by FEMA, which are areas subject to inundation by the 1-percent-annual-chance flood event. Project facilities would need to comply with the Kern County requirements for development within a 100-year floodplain. Drainage plans would be submitted and reviewed by Kern County to verify that potential flood waters would not increase the water surface elevations more than 1 foot or in

accordance with the Kern County Floodplain Ordinance. This, combined with the relatively small footprint of the structures, would ensure these elements do not result in substantial result in flooding on or off site.

Lastly, as described above, the project site is relatively flat and would remain so post-construction. The project would include a drainage plan that would further minimize the potential for increased flooding from the implementation of the project.

Thus, through conformance with all requirements contained within the Kern County Grading Ordinance and implementation of MM 4.10-1 and MM 4.10-2, long-term effects on drainage patterns and the potential to result in flooding on- or off-site, would be less than significant.

Mitigation Measures

Implementation of MM 4.10-1 and MM 4.10-2, as described above.

Level of Significance after Mitigation

Impacts would be less than significant.

(iii) Create or Contribute Runoff Water That Would Exceed the Capacity of Existing or Planned Stormwater Drainage Systems or Provide Substantial Additional Sources of Polluted Runoff

Construction

The project site is located in a remote, rural area with no existing or planned stormwater infrastructure. There are no existing stormwater drainage systems on the project site, and no stormwater drainage systems are proposed as part of the project. Due to the predominantly unpaved nature of the project site, stormwater generally infiltrates the surface of the project site or flows down-gradient. In paved portions of the project site, stormwater flows into surface drains and is allowed to discharge onto unpaved portions of the facility. The project site is drained by sheet flow and any existing rainfall and irrigation runoff, as well as that which would be applied during construction would percolate into the ground with minimal potential for runoff. If water from rainfall events during construction is not properly controlled, however, it could result in runoff containing silt or soil from bare ground surfaces.

In addition, runoff could contain potentially hazardous materials including, petroleum products (for example, gasoline, diesel, and motor oil), automotive fluids (for example, antifreeze, lubricant oils, transmission fluid, and hydraulic fluids), cement slurry, and other fluids utilized by construction vehicles and equipment if an accidental release of these materials were to occur during the construction phase.

To further reduce the potential for effects from erosion or other materials, the proposed project would be required to adhere to drainage plans approved by the Kern County Engineering, Surveying, and Permit Services Department. The proposed project also would comply with all

NPDES permit requirements detailed in the SWPPP and associated BMPs required by the Kern County Grading Code and Floodplain Management Ordinance. Conformance with these requirements would minimize stormwater runoff from the project site during construction. Thus, with the implementation of the SWPPP and BMPs required by the Kern County Grading Code (MM 4.10-1 and MM 4.10-2), impacts associated with polluted runoff during construction would be less than significant.

Operation

Development of the project site would create additional impervious surfaces. These changes would not substantially increase the amount of stormwater runoff. The project site is drained by sheet flow and does not rely on constructed stormwater drainage systems. As discussed above, the pattern and concentration of runoff could be altered by project activities such as grading and installation of the CCS facilities. Impacts related to polluted runoff from the operation of the project would be mitigated to less than significant levels with the implementation of MM 4.10-2, which requires the development of BMPs in compliance with the Kern County Grading Code to limit on-site and off-site erosion and flooding and to suppress dust.

As described above, a large amount of the project site would remain pervious and that would continue to absorb runoff. This also would enable runoff produced by the new minor impervious surfaces to infiltrate within the project site. Further, the drainage plan required by MM 4.10-2 would detail any necessary design features required to properly control stormwater runoff on site; design features would be appropriately sized for storm events per the final hydrology study performed for the site. Impacts related to stormwater drainage systems would be less than significant.

Mitigation Measures

Implementation of MM 4.10-1 and MM 4.10-2, as described above.

Level of Significance after Mitigation

Impacts would be less than significant.

(iv) Impede or Redirect Flood Flows

As described above, the central and southern portions of the project site are designated as Zone A, which are areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. As described above, under impact the project site is relatively flat and would remain so post-construction. The project would include a drainage plan that would further minimize the potential for increased flooding from the implementation of the project.

Thus, through conformance with all requirements contained within the Kern County Grading Ordinance and implementation of MM 4.10-1 and MM 4.10-2, long-term effects on drainage patterns and the potential to result in flooding on- or off-site, would be less than significant.

Mitigation Measures

Implementation of MM 4.10-1 and MM 4.10-2, as described above.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.10-4: Risk Release of Pollutants Due to Project Inundation in a Flood, Tsunami, or Seiche Zone

A tsunami is a series of ocean waves generated by sudden displacements in the sea floor, landslides, or volcanic activity. A seiche is a standing wave in an oscillating body of water. The project site is located approximately 70 miles east of the Pacific Ocean (near Morro Bay). Additionally, there are no enclosed bodies of water within the project vicinity. Therefore, the risk of tsunami or seiche in the project area is very low and there would be little or no chance for an impact involving the release of pollutants during such events. There would be no impact related to the release of pollutants due to project inundation from a tsunami or seiche.

Construction

The central and southern portions of the project site are designated as a Zone A by FEMA. Zone A comprises of areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. All other portions of the project site and off-site improvement areas are located in an area designated by FEMA as Zone X, which is an area of minimal flood hazard.

Although grading would occur on the project site and within areas designated as Zone A, the project site is relatively flat and level and ground disturbance would not substantially alter the overall topography or flow regime of these areas or the project site overall. Accordingly, grading would not substantially alter the existing contours of the site and there are no existing streams, rivers, or drainages that would be modified by construction activities. Thus, while runoff patterns and concentrations could be altered by grading activities, for the above-listed reasons, such changes would be minimal and the rate or amount of surface runoff resulting from project construction activities would be similar to the existing condition. This would not substantially increase the potential for on-site or off-site flooding.

Lastly, the potential effects would be further reduced through compliance with design specifications and BMPs required by the Kern County Grading Ordinance and the preparation of a SWPPP, included under MM 4.10-1, and completion of the grading plan under MM 4.10-2.

Further, as discussed in Section 4.9, *Hazards and Hazardous Materials*, the proposed project would not include the use, storage, or disposal of significant quantities of hazardous materials that could introduce pollutants to the environment should the areas be inundated. Therefore, considering the limited area of the site that is in the flood hazard area, the limited amount of storage of hazardous materials at the site, and the implementation of the drainage plan required by MM 4.10-2, which

would provide flood protection measures, the potential for release of pollutants due to project inundation impacts would be less than significant.

Operation

Operation of the project would slightly alter the existing drainage pattern on site. The facility pipeline would be built primarily aboveground within Aera Energy's existing operating properties; therefore, the project would not substantially alter drainage patterns of the site in a manner that would increase flooding potential. Additionally, as stated above, if the Proposed Substation and Proposed Post-Combustion Capture Facilities are within the flood zone, they would be designed to conform to the Kern County requirements for development within a 100-year floodplain and verified by Kern County that they would not increase the water surface elevations more than one foot or that they are out of accordance with the Kern County Floodplain Ordinance.

The Proposed Substation (Cogen 32 or Post-C Site) and Proposed Post-Combustion Capture Facilities (2868 Carbon Capture Facility and Cogen 32 Carbon Capture Facility) would be located within Zone A or Zone X. If the structures were to be located within Zone A, the building would need to comply with the Kern County requirements for development within a 100-year floodplain. Drainage plans would be submitted and reviewed by Kern County to verify that potential flood waters would not increase the water surface elevation more than 1 foot or in accordance with the Kern County Floodplain Ordinance. This, combined with the relatively small footprint of the structures would ensure these elements do not result in substantial changes to any potential flood flows.

Lastly, as described above, the project site is relatively flat and would remain so post-construction. The project would include a drainage plan that would conduct stormwater runoff to an on-site stormwater retention basin(s) that would retain certain rain events on site. This would further minimize the potential for increased flooding from the implementation of the project.

Thus, through conformance with all requirements contained within the Kern County Grading Ordinance and implementation of MM 4.10-1 and MM 4.10-2, long-term effects on drainage patterns and the potential to result in flooding on or off site, would be less than significant.

Mitigation Measures

Implementation of MM 4.10-1 and MM 4.10-2, as described above.

Level of Significance After Mitigation

Impacts would be less than significant.

Impact 4.10-5: Conflict with or Obstruct Implementation of a Water Quality Control Plan or Sustainable Groundwater Management Plan

Water Quality Control Plan: Basin Plan

The project site is located within the Central Valley RWQCB jurisdiction and is subject to the applicable requirements of the Basin Plan administered by the RWQCB in accordance with the Porter-Cologne Control Act. The Kern County Public Works Department requires the completion of an NPDES applicability form for projects with construction activities disturbing one or more acres and requires the project proponent to provide information about construction activities and to identify whether stormwater runoff has the potential of discharging into water of the United States, waters of the State, or a terminal drainage facility. As discussed above, the project would include required BMPs and drainage control requirements that would be consistent with the Basin Plan.

Sustainable Groundwater Management Plan

The project area is located within the WDWA plan area of the KGA GSP. A GSP chapter was prepared for the WDWA, a member agency of the KGA. The WDWA includes the BWSD, Berenda Mesa Water District (BMWD) and Lost Hills Water District (LHWD) in northwestern Kern County. As such, the WDWA has detailed information regarding groundwater conditions in the vicinity of the project site. Additionally, Aera Energy's groundwater wells are located in the BVGSA, which is a member agency of the KGA. A GSP chapter was prepared for the BVGSA and incorporated in the KGA "Umbrella" GSP.

As discussed above, the project would receive water from the BVWSD and BWSD. According to the BVGSA GSP, under the 2070 climate change factor, BVGSA has estimated a reduced Kern River entitlement of 147,000 afy in 2040 (Stantec 2023c). The BVWSD's entitlement to SWP water is expected to be 10,700 afy by the year 2030 and 9,642 afy by the year 2070. These projected totals account for reductions in future supply due to climate change. The GSP has calculated the projected water demand and increased deliveries over this same period to develop a water budget. Despite the overall surplus diminishing, it is projected that the BVWSD would still have a net positive balance of water supply over the next 50 years.

Regarding groundwater management, the main project site is located within the Subbasin and is subject to the applicable requirements of the BVGSA, WDWA, and KGA GSPs in accordance with SGMA. The Water Supply Assessment prepared for the project (Stantec 2023c) assessed whether the project would conflict with or obstruct implementation of the GSPs. The estimated annual demand for the project is not a de minimis use compared to existing available water supplies in the Subbasin. However, commercial project water demand is estimated to average up to 1,223 afy and would be produced water from the Belridge oilfields. Aera Energy also has approximately 7,000 af of surplus surface water stored in various groundwater banking projects through the BWSD that may be accessed at any time, subject to the groundwater bank's pumping capacity. Domestic water demands for commercial operation of the project are estimated to be 21.72 afy and would be provided by Aera Energy's water system to meet the domestic water demands of the project.

Although there is a historical and projected decline in groundwater in storage in the Subbasin and the WDWA and BVGSA plan areas, there is sufficient imported surface water available from BWSD and Aera Energy's banked water to meet the construction water demands of the project. In addition, commercial water demands would be met by produced water from Aera Energy and domestic water demands would be served by Aera Energy's water system. As a result, there is sufficient produced water and domestic water supplies available.

Conclusion

The operation of the CO_2 capture and storage facilities would not conflict with or obstruct implementation of the CWA or Basin Plan because there is no significant surface drainage, no surface water beneficial uses associated with the project area, and the Aquifer Exemption process determined the groundwater cannot serve as a current or future source of drinking water (Appendix F-2). Therefore, operation of the project would not conflict with or obstruct implementation of a water quality control or groundwater management plan.

As discussed above, the Water Supply Assessment prepared for the project concluded the project does not conflict with the applicable goals and sustainability criteria identified in the KGA, BVGSA, or WDWA GSPs because: 1) it would not result in exceedance of minimum thresholds or interfere with the achievement of measurable objectives identified in either GSP; 2) it would not physically or administratively conflict or interfere with any of the Project and Management Actions identified in either GSP. Therefore, the project would not interfere with a sustainable groundwater management plan and impacts would be less than significant.

Mitigation Measures

No mitigation would be required.

Level of Significance

Impacts would be less than significant.

4.10.5 Cumulative Setting, Impacts, and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present and reasonably foreseeable future oil and gas development including wells and abandonment activity to implement carbon capture and storage projects constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; an SREIR certified on March 8, 2021; and an Addendum adopted

on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provide evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The documents provide a projection of future production in the entire oil field over 25 years of 3,649 new wells per year countywide of various types (production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 other wells (cyclic wells, SB 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021) (Kern County Planning and Natural Resources Department 2021). The 25-year span from 2015 to 2040 has run for eight years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. CalGEM permitting for all wells with the exception of plugging and abandonments has never averaged over 2,000 permits a year (as implementation in some years of the Kern County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts on hydrological resources is considered the Tulare Lake Hydrologic Basin. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects*, would have on hydrological resources. This geographic scope of analysis is appropriate because the hydrological resources within this area are expected to be similar to those in the project site because of their proximity.

Impact 4.10-6: Contribute to Cumulative Hydrologic Resources Impacts

With regard to impacts on significant hydrologic resources, the project has the potential to contribute significantly to cumulative impacts within the region. A complete analysis of the cumulative impacts of the various ground-disturbing activities from oil and gas and the region wide basin groundwater conditions are provided in Section 4.9, *Hydrology and Water Quality* (Kern County Oil and Gas EIR). Through implementation of MM 4.9-1, MM 4.10-1 through MM 4.10-5, and MM 4.19-1 impacts on hydrological resources would be mitigated.

As described in Chapter 3, *Project Description*, of this EIR, there are multiple projects proposed throughout Kern County and the Southern San Joaquin Valley, including solar facilities, agricultural trucking facilities, telecommunications infrastructure, and commercial development. Many projects are anticipated to not be located within or adjacent to waters of the United States or wetland areas and would not result in discharges to those resources.

Water Quality

The proposed project's potential impacts on water quality from erosion and sedimentation are expected to be localized and temporary during construction. During project operation, runoff from rainwater would drain naturally and most water would infiltrate the ground surface. While some rainfall from the margins of the site could flow off-site via sheet flow, effects would be minimal and the potential for substantial erosion that could occur under concentrated runoff condition is considered low. Nonetheless, where potential for channel erosions exists, MM 4.9-1, MM 4.10-1, MM 4.10-2, MM 4.10-3, MM 4.10-4, MM 4.10-5, and MM 4.19-1 would be implemented to prevent long-term impacts on drainage patterns and water quality. In addition, all cumulative projects would be subject to and include similar mitigation to include MM 4.10-1, which requires the project to prepare and implement a SWPPP in accordance with County requirements. All projects that would not retain all runoff on site would be required to prepare a SWPPP, which would include BMPs designed to prevent the mixture of sediment and other pollutants with stormwater and degrading water quality. Similarly, for other projects that do not yet have a final drainage plan, one would be required prior to the issuance of building or grading permits.

Mitigation Measures

Implementation of Mitigation Measures MM 4.9-1, MM 4.10-1, MM 4.10-2, MM 4.10-3, MM 4.10-4, MM 4.10-5, and 4.19-1 would be required (see Section 4.9, *Hazards and Hazardous Materials*, and Section 4.19, *Utilities and Service Systems*, for full mitigation measure text).

Level of Significance after Mitigation

Less than significant.

Erosion, Drainage, and Flooding

With respect to erosion, drainage, and flooding, the project would implement MM 4.10-2, which would minimize direct impacts on erosion, drainage, and flooding. It is anticipated that other cumulative scenario projects would be required to implement similar measures, to minimize erosion, drainage, and flooding-related impacts. Additionally, drainage-related impacts from cumulative scenario projects would be primarily localized. Therefore, cumulative scenario impacts on erosion, drainage, and flooding are not anticipated to be cumulatively considerable, and the project would not contribute to a cumulative impact on flooding, erosion, or drainage.

The project and other projects, as applicable, would implement a Worker Environmental Awareness Program as part of MM 4.9-1 that would require appropriate handling of hazardous materials on-site to ensure they do not come into contact with stormwater and affect water quality. All other projects in the vicinity that would handle hazardous materials would be required to comply with any other applicable hazardous material regulations. Therefore, cumulative scenario impacts associated with water quality degradation would not be cumulatively considerable, and the project would not contribute to a cumulative impact on water quality.

Mitigation Measures

Implementation of Mitigation Measures MM 4.9-1, MM 4.10-1, MM 4.10-2, MM 4.10-3, MM 4.10-4, MM 4.10-5, and 4.19-1 would be required (see Section 4.9, *Hazards and Hazardous Materials*, and Section 4.19, *Utilities and Service Systems*, for full mitigation measure text).

Level of Significance after Mitigation

Less than significant.

Groundwater Supply

With regard to substantially decreasing groundwater supplies or interfering with groundwater recharge, MM 4.19-1 would be implemented to ensure that any groundwater or reclaimed water used is accounted for should the project require additional water supplies in excess of the allotment from the District. Other projects in the vicinity would also be required to comply with similar water supply regulations.

With regard to water supply, as concluded in the Water Supply Assessment, the project has sufficient imported surface water available from BWSD, Aera Energy's banked and produced water, Aera Energy's water system to support both the construction and operational demands of the project. As a result, there are adequate water supplies available in the WDWA and BVGSA plan areas to serve the project over the next 20 years under all water year conditions. Because the general land use trend in the region is a conversion of agriculture to less water-intensive land uses, this conclusion holds even when considering existing and planned future uses of the identified water supplies.

While the Subbasin is currently in a state of overdraft, the conversion of the project site from extensive agricultural uses (for example, livestock grazing, dry land farming, and accessory agricultural industries) to CCS is supportive of the GSP's long-term goal of achieving a balanced water budget because it would use less water over the long term. Additionally, Aera Energy has approximately 7,000 af of surplus surface water stored in various groundwater banking projects through the BWSD that may be accessed at any time, subject to the groundwater bank's pumping capacity. Therefore, the project's water use, in combination with other cumulative scenario projects requiring groundwater, would be less than significant.

Mitigation Measures

Implementation of Mitigation Measures MM 4.9-1, MM 4.10-1, MM 4.10-2, MM 4.10-3, MM 4.10-4, MM 4.10-5, and 4.19-1 would be required (see Section 4.9, *Hazards and Hazardous Materials*, and Section 4.19, *Utilities and Service Systems*, for full mitigation measure text).

Level of Significance after Mitigation

Cumulative impacts would be significant and unavoidable for groundwater supply.

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Section 4.11

Land Use and Planning

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Section 4.11

Land Use and Planning

4.11.1 Introduction

This section of the Environmental Impact Report (EIR) describes the affected environmental and regulatory settings for land use and planning. It also describes the impacts on land use and planning that would result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers) southwest of the community of Lost Hills and west of State Route (SR) 33.

The information in this section is based primarily, but not exclusively, on a review of the project's consistency with the Kern County General Plan (KCGP) and the Kern County Zoning Ordinance.

A description of the environmental setting (affected environment) for land use and planning is presented in Section 4.11.2, *Environmental Setting*. The regulatory setting applicable to land use and planning is also presented in Section 4.11.3, *Regulatory Setting*, and Section 4.11.4, *Impacts and Mitigation Measures*, discusses project impacts and associated mitigation measures.

4.11.2 Environmental Setting

Kern County (County) is California's third largest county, encompassing 8,202 square miles at the southern end of the Central Valley. The project area is in the western portion of the County in the San Joaquin Valley and is bounded by Kings and Tulare Counties to the north, Santa Barbara and San Luis Obispo Counties to the west, the Tehachapi Mountains and the Sierra Nevada Mountain Range to the east, and the northern boundary of the Los Padres National Forest to the south.

Kern County contains 11 incorporated cities, none of which overlap with the Belridge oilfields and the proposed project's Conditional Use Permit (CUP) boundary. The closest community is the Lost Hills community, which is located approximately 7 miles east of the project.

On-site Land Uses

The project site is located within the Central Valley portion of unincorporated Kern County and is comprised of 45 parcels within the administrative boundaries of the Belridge oilfields. The Belridge oilfields are contiguous and located west of SR 33, approximately 7 miles southwest of the community of Lost Hills (population 2,370). Together, the two Belridge oilfields cover an area of approximately 13 miles long and 3 miles wide. Aera Energy is the primary operator within both oilfields.

The project is located within Sections 20, 21, 22, 26, 27, 28, 34, 35, and 36 of Township 27 South, Range 20 East; Sections 1, 2, and 12 of Township 28 South, Range 20 East; Sections 6, 7, 17, 18, 20, 27, 28, 29, 32, 33, and 34 of Township 28 South Range 21 East; and Sections 2, 3, and 4 of Township 29 South, Range 21 East of the Mount Diablo Base and Meridian.

Primary access to the project site would be from Oasis Road, a private road, accessed from Seventh Standard Road, west of SR 33. The access road connects to a network of existing dirt roads within the field; depending on the final project design (for example, location of injection wells and accessory facilities), new internal access roads may be constructed.

As discussed in Section 4.9, *Hazards and Hazardous Materials*, the nearest public airport to the project site is the Elk Hills-Buttonwillow Airport located approximately 14 miles southeast of the project site. The project site is not located within any safety or noise contour zone for this airport, nor is the project site located within a designated Kern County Airport Land Use Compatibility Plan.

As discussed in Section 4.2, *Agriculture and Forestry Resources*, the project site is not designated as Prime Farmland, Farmland of Statewide Importance, or Unique Farmland by the California Department of Conservation (DOC). However, the proposed project site has two parcels (assessor's parcel number [APN]: 068-220-26, and 085-210-42) and a portion of one parcel (APN: 068-200-33) subject to Farmland Security Zone Contracts and one parcel (APN: 068-200-33) subject to Williamson Act Land Use Contracts. The project site is also included within Kern County Agricultural Preserve Number 2 and 5, as Agricultural Preserve inclusion is the standard practice in Kern County for any land that is zoned A (Exclusive Agriculture).

As discussed in Section 4.10, *Hydrology and Water Quality*, the majority of the project site is designated as Zone "X" on the Flood Insurance Rate Map as issued by the Federal Emergency Management Agency (FEMA), which indicates the site is outside of the 0.2 percent annual chance floodplain. However, portions of the proposed pipeline routes are designated as Zone "A" flood hazard area, which indicates the site has a 1 percent chance of flooding. No areas were identified on the project site that exhibit characteristics of wetlands as defined by the U.S. Army Corps of Engineers.

As discussed in Section 4.12, *Mineral Resources*, no locally important mineral resource recovery sites are delineated in the KCGP; however, several parcels within the project area are designated as "mineral and petroleum" land use. The project site is located on lands designated as a Mineral Resource Zone 3 by the DOC's State Mining and Geology Board, where known or inferred mineral occurrences of undetermined mineral resource significance are present (CGS 2009). The majority of the Belridge oil fields are designated by the KCGP for mineral and petroleum exploration and extraction.

The project site is located within unincorporated Kern County and within the administrative boundaries of the KCGP. Table 4.11-1 identifies the existing Land Use designations, Adopted General Plan Map Code Designations, and Existing Zoning for the project site and for areas north, south, east, and west of the project site. As shown in Table 4.11-1, the project site is currently

located within the A (Exclusive Agriculture), A-1 (Limited Agriculture); NR (20) (Natural Resource, Min 20 Acre Parcel Size) zone districts. The A district permits solar energy electrical generators subject to the approval of a Conditional Use Permit.

Table 4.11-1: On-site and Surrounding Land Use, General Plan Map Code Designations, and Zoning

Location	Existing Land Use	Existing General Plan Map Code Designations	Existing Zoning
Project Site	Oil and Gas Exploration and Production	2.5 (Flood Hazard Overlay) 8.1 (Intensive Agriculture) 8.3 (Extensive Agriculture) 8.4 (Mineral and Petroleum)	A (Exclusive Agriculture) A-1 (Limited Agriculture) NR (20) (Natural Resource, Min 20 Acre Parcel Size)
North	Oil and Gas Exploration and Production, Undeveloped Private Land, Agriculture	8.3 (Extensive Agriculture)	A (Exclusive Agriculture)
East	Agriculture	2.5 (Flood Hazard Overlay) 8.1 (Intensive Agriculture)	A (Exclusive Agriculture)
South	Oil and Gas Exploration and Production	2.5 (Flood Hazard Overlay) 8.4 (Mineral and Petroleum)	A (Exclusive Agriculture)
West	Oil and Gas Exploration and Production, Undeveloped Land	2.5 (Flood Hazard Overlay 8.3 (Extensive Agriculture)	A (Exclusive Agriculture) A-1 (Limited Agriculture)

Surrounding Land Uses

Existing land uses in the project area were determined from a visual survey of the project area, publicly available geographical information system data, and a review of the KCGP. The predominant land uses in Belridge oilfields are oil and gas development with small areas of agriculture. In general, land uses are grouped as follows:

- **Oil and Gas Development**. Mineral and petroleum extraction is also a predominant land use within the project area and is an allowable use under most zoning designations, as described below (see Table 4.11-1). The Natural Resource (NR) Zoning District designates areas with petroleum, mineral, or timber resources, and limits uses in such areas to resource exploration, production, and transportation, or compatible uses.
- **Agriculture**. Some of the land interspersed throughout the project area is zoned for extensive agricultural uses, such as livestock grazing, dry land farming, and accessory agricultural industries. Uses shall include the following: livestock grazing; dry land farming; ranching facilities; wildlife and botanical preserves; timber harvesting; one

single-family dwelling unit; irrigated croplands; water storage or groundwater recharge areas; mineral, aggregate, and petroleum exploration and extraction; and recreational activities, such as gun clubs and guest ranches. Land within development areas is subject to significant physical constraints.

Existing land use near the project site generally includes oil and gas exploration and production and agricultural lands. Development in the area surrounding the project site includes oil and gas exploration and production, grazing, and agricultural lands. The sensitive receptor closest to the proposed project site is a small housing tract on Lost Hills Road, north of Lerdo Highway, roughly 3 miles east of the proposed project site. The community of Lost Hills is located 7 miles northeast of the proposed project site. Lost Hills Wonderful Park, a local park, is located approximately 7 miles northeast of the nearest injection well. Schools near the project site are listed in Table 3-3 (see Chapter 3, *Project Description*).

Kern County General Plan Land Use Designations

The KCGP provides the underlying land use designations within the project area. Table 4.11-2 lists the predominant land use designation applicable to the project area. The majority of the project area is subject to the Mineral and Petroleum land use designation (KCGP Code 8.4).

Table 4.11-2: Kern County General Plan Classifications within the Project Area

KCGP Code	KCGP Name
8.1	Intensive Agriculture (minimum 20 acres)
8.3	Extensive Agriculture (minimum 20 acres)
8.4	Mineral and Petroleum (minimum 5 acres)
8.1/2.5	Intensive Agriculture (minimum 20 acres)/Flood Hazard
8.1/2.5	Intensive Agriculture (minimum 20 acres)/Flood Hazard
8.4/2.5	Mineral and Petroleum (minimum 5 acres)/ Flood Hazard

Key:
KCGP = Kern County General Plan

Existing Zoning

The Kern County Zoning Ordinance regulates land uses within the project area, implements the underlying KCGP land use designations for applicable locations in the County, and is consistent with the KCGP. The General Plan Map Code Designations in the project area are listed in Table 4.11-3.

The Kern County Zoning Ordinance list has adopted zone districts with lists of permitted uses and lists of uses that are permitted with additional review through processing of a CUP. New types of businesses and industries appear over time and may not be specifically listed in the ordinance. An example of this evolution is that the ordinance still lists in the C-1 (Neighborhood Commercial)

Zone District with video and audiotape sales and rental as a permitted use. This type of store has, while everywhere in the past, been almost completely replaced by the internet. Updating the zoning ordinance is a process of public hearings and official publishing of notices that takes six to eight months. Therefore, it is impractical to update the text for all potential types of new industries or uses every few months. Since its first adoption in 1986, the ordinance has addressed this situation. It provides for procedures to evaluate new uses and determine the proper process for consideration. Chapter 19.08 contains the following pathways for review of uses not specifically listed in the Ordinance Sections 19.08.030, Determination of Similar Use, and 19.09.085, Alternative to Determination of Similar Use. These determinations are then incorporated into the ordinance during a regularly scheduled comprehensive update.

The proposed project along with the other projects proposed in Kern County, shown on the cumulative project list in Chapter 3, *Project Description*, have been evaluated under Ordinance Section 19.08.085 Alternative to Determination of Similar Use. The Alternative to Determination of Similar Use ordinance provides that the planning director may authorize the filing of a CUP to allow the establishment of a use not expressly authorized provided the planning director determines the proposed use is not inherently incompatible with the purposes of the applicable zoning district. Carbon capture and storage (CCS), as proposed in this project, is the mechanical process of capturing and storing atmospheric CO_2 in an area with geographic formations and space for storage underground primarily in the existing oilfield areas. While CCS might be related to oil and gas activities, it has also been proposed in association with other types of industrial use, unrelated to the oil and gas industry. The planning director has determined that CCS is a storage operation and not a manufacturing operation, and, therefore, has been evaluated based on that use. The determination memo was issued by the Planning Director in 2022 and made the following determination:

CCS underground in existing formations or tanks can only be permitted with the processing of a CUP in the following Zone Districts:

- A – (Exclusive Agriculture) – Conditional Use Permit (Resource Extraction and Energy Development Uses)
- M-2 and M-2 PD (Medium Industrial) – Conditional Use Permit (Resource Extraction and Energy Development Uses)
- M-3 and M-3 PD (Medium Industrial) – Conditional Use Permit (Resource Extraction and Energy Development Uses)

CO_2 pipelines in or crossing any zone district require a CUP if delivering CO_2 for CCS or to tanks for storage.

Based on this interpretation, residential and commercial zones cannot be used to process a permit for CCS.

Section 19.06.020, Authority to Administer, gives the planning director the authority to administer the zoning ordinance, including interpretation of the text. The decision of the planning director is final.

CUPs are processed under the requirements of Chapter 19.104, Conditional Use Permits, and the process in Section 19.102.020. CCS projects require the use of underground empty areas, called pore space that belong to the surface owner, not the mineral owner. Authorization from the surface owner for an application for a CCS project to utilize the pore space is required under Section 19.104.040, Basis for Approval.

The decision-making authority may approve or conditionally approve an application for a CUP if it finds all of the following:

A. The proposed use is consistent with the goals and policies of the applicable general or specific plan.

B. The proposed use in consistent with the purpose of the applicable district or districts.

C. The proposed use is listed as a use subject to a CUP in the applicable zoning district or districts or the use is determined to be similar to a listed conditional use in accordance with the procedures set out in Sections 19.08.030 through 19.0.080 in this title.

D. The proposed use meets the minimum requirements of this title applicable to the use.

E. The proposed use will not be materially detrimental to the health, Safety, and welfare of the public or to property and residents in the vicinity.

Section 19.107.170 provides that the CUP is considered by the Planning Commission with an appeal possible to the Board of Supervisors. However, the related zone changes require the Planning Commission to make a recommendation to the Board of Supervisors and they make the final decision. Therefore, both the zone changes and CUPs will be heard by the Planning Commission, with final consideration by the Board of Supervisors. No appeal filing will be required. The decision of the Board of Supervisors on both the zone change and CUP would be final.

Implementation of the project could not occur without additional approvals from the U.S. Environmental Protection Agency (EPA) for the Class IV Underground Injection Control permits and conformance with all conditions and mitigation.

Proposed Project

Table 4.11-3: Project APNs, General Plan Map Codes, Zoning, and Acreage

APN	Existing Map Code Designations	Existing Zoning	Proposed Zoning	Acres	Williamson Act Land Use Contract	Farmland Security Zone
068-200-16	8.4	A-1	A	40	-	-
068-200-30	8.4	A	A	44.8	-	-
068-200-33	8.3/8.4	A	A	192.34	WA	FSZ
068-200-37	8.4	A	A	37.23	-	-

Table 4.11-3: Project APNs, General Plan Map Codes, Zoning, and Acreage

APN	Existing Map Code Designations	Existing Zoning	Proposed Zoning	Acres	Williamson Act Land Use Contract	Farmland Security Zone
068-200-41	8.4	A	A	66.84	-	-
068-210-18	8.3/8.4	A	A	360	-	-
068-220-01	8.4	A	A	640	-	-
068-220-08	8.4	A	A	80	-	-
068-220-13	8.4	A	A	640	-	-
068-220-25	8.4	A-1	A	40	-	-
068-220-26	8.4	A	A	118.85	-	FSZ
068-220-36	8.4	A	A	324.1	-	-
068-220-37	8.4	A	A	18.52	-	-
068-220-39	8.4	A	A	26.17	-	-
068-220-42	8.4/8.1	A	A	123.6	-	-
068-220-44	8.4	A	A	78.29	-	-
068-220-55	8.4	A	A	152.36	-	-
068-230-04	8.3/8.4	A-1	A	640	-	-
085-110-10	8.4/2.5	A-1	A	554.84	-	-
085-110-13	8.4	A	A	160	-	-
085-110-14	8.4	A	A	160	-	-
085-110-16	8.4	A	A	80	-	-
085-110-32	8.4	A	A	382.33	-	-
085-110-50	8.4/2.5	A-1	A	462.54	-	-
085-190-27	8.1/8.4	A	A	64.77	-	-
085-190-28	8.1/8.4	A	A	309.82	-	-
085-210-18	8.4/2.5	A	A	619.15	-	-
085-210-40	8.1/2.5	A	A	135.3	-	-
085-210-42	8.1/2.5	A	A	313.16	-	FSZ
085-210-43	8.4/2.5	A	A	530.22	-	-
085-220-19	8.1/2.5	A	A	14.77	-	-
085-220-21	8.4/2.5	A	A	287.87	-	-
085-220-22	8.4/2.5	A	A	336.16	-	-
085-220-36	8.1/2.5	A	A	274.99	-	-
085-230-05	8.4	A	A	640	-	-
085-230-07	8.4/2.5	A	A	631.36	-	-
085-230-09	8.4/2.5	A/NR(20)	A	636.36	-	-
085-230-25	8.1/8.4	A	A	139.79	-	-
085-230-26	2.5/8.1/8.4	A	A	493.18	-	-

Table 4.11-3: Project APNs, General Plan Map Codes, Zoning, and Acreage

APN	Existing Map Code Designations	Existing Zoning	Proposed Zoning	Acres	Williamson Act Land Use Contract	Farmland Security Zone
085-230-34	8.4	A	A	5	-	-
098-111-01	8.4	A	A	315.78	-	-
098-111-03	8.4/8.3	A	A	320	-	-
098-112-01	8.4	A	A	277.07	-	-
098-112-02	8.4	A	A	276.98	-	-
098-120-10	8.4/8.3	A	A	317.04	-	-
Total Acreages				**12,361.58**		

Key
(-) Not Applicable

Kern County General Plan Map Code Designations:
2.5 (Flood Hazard Overlay)
8.1 (Intensive Agriculture)
8.3 (Extensive Agriculture)
8.4 (Mineral and Petroleum)

Kern County Zoning District:
A (Exclusive Agriculture); A-1 (Limited Agriculture); NR (20) (Natural Resource, Min 20 Acre Parcel Size)

Williamson Act Land Use Contract:
WA - Active

Farmland Security Zone:
FSZ - Active

4.11.3 Regulatory Setting

Federal

U.S. Fish and Wildlife Service recovery plans for endangered species apply to the project site. Information on these plans is provided in Section 4.4, *Biological Resources*.

State

Various State agencies have jurisdiction over local agencies and have plans and programs that apply to the project site. They include the Amended Kern Groundwater Authority Groundwater Sustainability Plan, Kern Integrated Regional Water Management Plan, Tulare Lake Basin Portion of Kern County Integrated Regional Water Management Plan, Western Kern Water District 2020 Urban Water Management Plan, Recovery Plan for Upland Species of the San Joaquin Valley, California Air Quality Plans, One-Hour Ozone Plan, Eight-Hour Ozone Plan, PM_{10} Maintenance

Plan, $PM_{2.5}$ Plan, Air Quality Conformity Determination for Transportation Plans, and California Department of Fish and Wildlife recovery and habitat plans for endangered species. Information on these plans is provided in Section 4.4 *Biological Resources*. Section 4.3, *Air Quality*, Section 4.8, *Greenhouse Gases*, and Section 4.10, *Hydrology and Water.*

Local

Land use and planning decisions within and adjacent to the project site are guided and regulated by the KCGP and Kern County Zoning Ordinance. The KCGP contains goals, objectives, and policies and provides an overall foundation for establishing land use patterns. For this land use impact analysis, this section lists all relevant goals, objectives, policies, and implementation measures related to the proposed project. The Zoning Ordinance contains regulations through which the KCGP's provisions are implemented. The most relevant regulations pertaining to the development of the proposed project are presented below.

Other local and County plans relevant to the project are referenced as applicable, in each section of this EIR. These plans include the Kern County Fire Department Strategic Fire Plan, Kern County Fire Department Wildland Fire Management Plan, Kern County Multi-Jurisdiction Hazard Mitigation Plan, Kern County Integrated Waste Management Plan, and Kern County Airport Land Use Compatibility Plan.

Kern County General Plan

The project area is located within the KCGP; therefore, it would be subject to applicable policies and measures of the KCGP (Kern County 2009). The Land Use, Conservation, and Open Space Element, Circulation Element, Noise Element, Safety Element, and Energy Element of the KCGP include goals, policies, and implementation measures related to land use and planning that apply to the project, as described below.

Chapter 1. Land Use, Conservation, and Open Space Element

1.3. Physical and Environmental Constraints

Goals

Goal 1. To strive to prevent loss of life, reduce personal injuries, and property damage, minimize economic and social diseconomies resulting from natural disaster by directing development to areas which are not hazardous.

Policies

Policy 1. Kern County will ensure that new developments will not be sited on land that is physically or environmentally constrained ((Map Code 2.1 (Seismic Hazard), Map Code 2.2 (Landslide), Map Code 2.3 (Shallow Groundwater), Map Code 2.5 (Flood Hazard), Map Codes from 2.6 – 2.9, Map Code 2.10 (Nearby Waste Facility), and Map Code 2.11 (Burn Dump Hazard) to support such development unless appropriate studies establish that such development will not result in unmitigated significant impact.

Policy 3. Zoning and other land use controls will be used to regulate and, in some instances, to prohibit development in hazardous areas.

Policy 8. Encourage the preservation of the floodplain's flow conveyance capacity, especially in floodways, to be open space/passive recreation areas throughout the County.

Policy 9. Construction of structures that impede water flow in a primary floodplain will be discouraged.

Policy 10. The County will allow lands which are within flood hazard areas, other than primary floodplains, to be developed in accordance with the General Plan and Floodplain Management Ordinance, if mitigation measures are incorporated so as to ensure that the proposed development will not be hazardous within the requirements of the Safety Element (Chapter 4) of this General Plan.

Policy 11. Protect and maintain watershed integrity within Kern County.

Implementation Measures

Implementation Measure D. Review and revise the County's current Grading Ordinance as needed to ensure that its standards minimize permitted topographic alteration and soil erosion while maintaining soil stability.

Implementation Measure F. The County will comply with the Colbey-Alquist Floodplain Management Act in regulating land use within designated floodways.

Implementation Measure H. Development within areas subject to flooding, as defined by the appropriate agency, will require necessary flood evaluations and studies.

Implementation Measure J. Compliance with the Floodplain Management Ordinance prior to grading or improvement of land for development or the construction, expansion, conversion or substantial improvements of a structure is required.

Implementation Measure N. Applicants for new discretionary development should consult with the appropriate Resource Conservation District and the California Regional Water Quality Control Board regarding soil disturbances issues.

1.4. Public Facilities and Services

Goals

Goal 1. Kern County residents and businesses should receive adequate and cost-effective public services and facilities. The County will compare new urban development proposals and land use changes to the required public services and facilities needed for the proposed Project.

Goal 5. Ensure that adequate supplies of quality (appropriate for intended use) water are available to residential, industrial, and agricultural users within Kern County.

Goal 9. Serve the needs of industries and Kern County residents in a manner that does not degrade the water supply and the environment and protect the public health and safety by avoiding surface and subsurface nuisances resulting from the disposal of hazardous wastes, irrespective of the geographic origin of the waste.

Policies

Policy 1. New discretionary development will be required to pay its proportional share of the local costs of infrastructure improvements required to service such development.

Policy 3. Individual projects will provide availability of public utility service as per approved guidelines of the serving utility.

Policy 6. The County will ensure adequate fire protection to all Kern County residents.

Policy 7. The County will ensure adequate police protection to all Kern County residents.

Policy 15. Prior to approval of any discretionary permit, the County shall make the finding, based on information provided by the CEQA documents, staff analysis, and the applicant, that adequate public or private services and resources are available to serve the proposed development.

Implementation Measures

Implementation Measure B. Determine local costs of County facility and infrastructure improvements and expansion which are necessitated by new development of any type and prepare a schedule of charges to be levied on the developer at the site of approval of the Final Map. This implementation can be effectuated by the formation of a County work group.

Implementation Measure C. Project developers shall coordinate with the local utility service providers to supply adequate public utility services.

Implementation Measure D. Involve utility providers in the land use and zoning review process.

Implementation Measure L. Prior to the approval of development projects, the County shall determine the need for fire protection services. New development in the County shall not be approved unless adequate fire protection facilities and resources can be provided.

Implementation Measure N. Secure complete and accurate information on all hazardous wastes generated, handled, stored, treated, transported, and disposed of within or through Kern County.

1.9. Resources

Goals

Goal 1. To contain new development within an area large enough to meet generous protections of foreseeable need, but in locations that will not impair the economic strength derived from the petroleum, agriculture, rangeland, or mineral resources or diminish the other amenities that exist in the County.

Goal 2. Protect areas of important mineral, petroleum, and agricultural resource potential for future use.

Goal 3. Ensure the development of resource areas minimize effects on neighboring resource lands.

Goal 4. Encourage safe and orderly energy development within the County, including research and demonstration projects, and to become actively involved in the decision and actions of other agencies as they affect energy development in Kern County.

Goal 5. Conserve prime agriculture lands from premature conversion.

Policies

Policy 1. Appropriate resource uses of all types will be encouraged as desirable and consistent interim uses in undeveloped portions of the County regardless of General Plan designation.

Policy 5. Areas of low intensity agriculture use (Map Code 8.2 (Resource Reserve), Map Code 8.3 (Extensive Agriculture), and Map Code 8.5 (Resource Management)) should be of an economically viable size in order to participate in the State Williamson Act Program/Farmland Security Zone Contract.

Policy 7. Areas designated for agricultural use, which include Class I and II and other enhanced agricultural soils with surface delivery water systems, should be protected from incompatible residential, commercial, and industrial subdivision and development activities.

Policy 10. To encourage effective groundwater resource management for the long-term economic benefit of the County the following shall be considered:

a. Promote groundwater recharge activities in various Zone Districts.
b. Support for the development of Urban Water Management Plans and promote Department of Water Resources grant funding for all water providers.
c. Support the development of groundwater management plans.
d. Support the development of future sources of additional surface water and groundwater, including conjunctive use, recycled water, conservation, additional storage of surface water and groundwater and desalination.

Policy 11. Minimize the alteration of natural drainage areas. Require development plans to include necessary mitigation to stabilize runoff and silt deposition through utilization of grading and flood protection ordinances.

Policy 12. Areas identified by the Natural Resource Conservation Service (formerly Soil Conservation Service) as having high range-site value should be conserved for Extensive Agriculture uses or as Resource Reserve, if located within a County water district.

Policy 14. Emphasize conservation and development of identified mineral deposits.

Policy 25. Discourage incompatible land use adjacent to Map Code 8.4 (Mineral and Petroleum) areas.

Implementation Measures

Implementation Measure B. Areas designated as Resource Reserve (Map Code 8.2), Extensive Agriculture (Map Code 8.3), Resource Management (Map Code 8.5) that are under Williamson Act Contracts or Farmland Security Zone Contracts will have a minimum parcel size of 80 acres until such time as a contract is expired or is canceled, at which time the minimum parcel size will become 20 acres.

Implementation Measure C. The County Planning Department will seek review and comment from the County Engineering and Survey Services Department on the implementation of the National Pollution Discharge Elimination System for all discretionary projects.

Implementation Measure F. Prime agricultural lands, according to the Kern County Interim-Important Farmland map produced by the Department of Conservation, which have Class I or II soils and a surface delivery water system shall be conserved through the use of agricultural zoning with minimum parcel size provisions.

Implementation Measure G. Property placed under the Williamson Act/Farmland Security Zone Contract must be in a Resource designation**.**

Implementation Measure H. Use the California Geological Survey's latest maps to locate mineral deposits until the regional and statewide importance mineral deposits map has been completed, as required by the Surface Mining and Reclamation Act.

1.10. General Provisions

Goals

Goal 1. Ensure that the County can accommodate anticipated future growth and development while maintaining a safe and healthful environment and a prosperous economy by preserving valuable natural resources, guiding development away from hazardous areas, and assuring the provision of adequate public services.

1.10.1. Public Services and Facilities

Policies

Policy 9. New development should pay its pro rata share of the local cost of expansions in services, facilities, and infrastructure which it generates and upon which it is dependent.

Policy 15. Prior to approval of any discretionary permit, the County shall make the finding, based on information provided by the California Environmental Quality Act (CEQA) documents, staff analysis, and the applicant, that adequate public or private services and resources are available to serve the proposed development.

Policy 16. The developer shall assume full responsibility for costs incurred in service extensions or improvements that are required to serve the project. Cost sharing or other forms of recovery shall be available when the service extensions or improvements have a specific quantifiable regional significance.

Implementation Measures

Implementation Measure E. All new discretionary development projects shall be subject to the Standards for Sewage, Water Supply and Preservation of Environmental Health Rules and Regulations administered by the Environmental Health Services Department. Those projects having percolation rates of less than five minutes per inch shall provide a preliminary soils study and site-specific documentation that characterizes the quality of upper groundwater in the project vicinity and evaluation of the extent to which, if any, the proposed use of alternative septic systems will adversely impact groundwater quality. If the evaluation indicates that the uppermost groundwater at the proposed site already exceeds groundwater quality objectives of the Regional Water Quality Control Board or would if the alternative septic system is installed, the applicant shall be required to supply sewage collection, treatment and disposal facilities.

1.10.2. Air Quality

Policies

Policy 18. The air quality implications of new discretionary land use proposals shall be considered in approval of major developments. Special emphasis will be placed on minimizing air quality degradation in the desert to enable effective military operations and in the valley region to meet attainment goals.

Policy 19. In considering discretionary projects for which an Environmental Impact Report must be prepared pursuant to the California Environmental Quality Act, the appropriate decision-making body, as part of its deliberations, will ensure that:

a. All feasible mitigation to reduce significant adverse air quality impacts have been adopted; and

b. The benefits of the proposed Project outweigh any unavoidable significant adverse effects on air quality found to exist after inclusion of all feasible mitigation. This finding shall be made in a statement of overriding considerations and shall be supported by factual evidence to the extent that such a statement is required pursuant to the California Environmental Quality Act.

Policy 20. The County shall include fugitive dust control measures as a requirement for discretionary projects and as required by the adopted rules and regulations of the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District on ministerial permits.

Policy 21. The County shall support air districts' efforts to reduce PM_{10} and $PM_{2.5}$ emissions.

Policy 22. Kern County shall continue to work with the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District toward air quality attainment with federal, state, and local standards.

Implementation Measures

Implementation Measure F. All discretionary permits shall be referred to the appropriate air district for review and comment.

Implementation Measure G. Discretionary development projects involving the use of tractor trailer rigs shall incorporate diesel exhaust reduction strategies including, but not limited to:

a. Minimizing idling time.
b. Electrical overnight plug-ins.

Implementation Measure H. Discretionary projects may use one or more of the following to reduce air quality effects:

a. Pave dirt roads within the development.
b. Pave outside storage areas.
c. Provide additional low Volatile Organic Compounds (VOC) producing trees on landscape plans.
d. Use of alternative fuel fleet vehicles or hybrid vehicles.
e. Use of emission control devices on diesel equipment.
f. Develop residential neighborhoods without fireplaces or with the use of Environmental Protection Agency certified, low emission natural gas fireplaces.
g. Provide bicycle lockers and shower facilities on site.
h. Increasing the amount of landscaping beyond what is required in the Zoning Ordinance (Chapter 19.86).
i. The use and development of park and ride facilities in outlying areas.
j. Other strategies that may be recommended by the local Air Pollution Control Districts.

Implementation Measure J. The County should include PM_{10} control measures as conditions of approval for subdivision maps, site plans, and grading permits.

1.10.3. Archaeological, Paleontological, Cultural, and Historical Preservation

Policies

Policy 25. The County will promote the preservation of cultural and historic resources which provide ties with the past and constitute a heritage value to residents and visitors.

Implementation Measures

Implementation Measure K. Coordinate with the California State University, Bakersfield's Archaeology Inventory Center.

Implementation Measure L. The County shall address archaeological and historical resources for discretionary projects in accordance with the California Environmental Quality Act (CEQA).

Implementation Measure M. In areas of known paleontological resources, the County should address the preservation of these resources where feasible.

Implementation Measure N. The County shall develop a list of Native American organizations and individuals who desire to be notified of proposed discretionary projects. This notification will be accomplished through the established procedures for discretionary projects and CEQA documents.

Implementation Measure O. On a project specific basis, the County Planning Department shall evaluate the necessity for the involvement of a qualified Native American monitor for grading or other construction activities on discretionary projects that are subject to a CEQA document.

1.10.5. Threatened and Endangered Species

Goals

Goal 1. Ensure that the County can accommodate anticipated future growth and development while a safe and healthful environment and a prosperous economy by preserving valuable natural resources, guiding development away from hazardous areas, and assuring the provision of adequate public services.

Policies

Policy 27. Threatened or endangered plant and wildlife species should be protected in accordance with state and federal laws.

Policy 28. County should work closely with state and federal agencies to assure that discretionary projects avoid or minimize impacts to fish, wildlife, and botanical resources.

Policy 29. The County will seek cooperative efforts with local, state, and federal agencies to protect listed threatened and endangered plant and wildlife species through the use of conservation plans and other methods promoting management and conservation of habitat lands.

Policy 31. Under the provisions of the California Environmental Quality Act (CEQA), the County, as lead agency, will solicit comments from the California Department of Fish and Game and the U.S. Fish and Wildlife Service when an environmental document (Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report) is prepared.

Policy 32. Riparian areas will be managed in accordance with United States Army Corps of Engineers, and the California Department of Fish and Game rules and regulations to enhance the

drainage, flood control, biological, recreational, and other beneficial uses while acknowledging existing land use patterns.

Implementation Measures

Implementation Measure Q. Discretionary projects shall consider effects to biological resources as required by the California Environmental Quality Act.

Implementation Measure R. Consult and consider the comments from responsible and trustee wildlife agencies when reviewing a discretionary project subject to the California Environmental Quality Act.

Implementation Measure S. Pursue the development and implementation of conservation programs with state and federal wildlife agencies for property owners desiring streamlined endangered species mitigation programs.

1.10.6. Surface Water and Groundwater

Policies

Policy 34. Ensure that water quality standards are met for existing users and future development.

Policy 41. Review development proposals to ensure adequate water is available to accommodate projected growth.

Policy 43. Drainage shall conform to the Kern County Development Standards and the Grading Ordinance.

Policy 44. Discretionary projects shall analyze watershed impacts and mitigate for construction-related and urban pollutants, as well as alterations of flow patterns and introduction of impervious surfaces as required by the California Environmental Quality Act (CEQA), to prevent the degradation of the watershed to the extent practical.

Implementation Measures

Implementation Measure X. Encourage effective groundwater resource management for the long-term benefit of the County through the following:

i. Promote groundwater recharge activities in various Zone Districts.

iii. Support the development of Groundwater Management Plans.

iv. Support the development of future sources of additional surface water and groundwater, including conjunctive use, recycled water, conservation, additional storage of surface water, and groundwater and desalination.

Implementation Measure Y. Promote efficient water use by utilizing measures such as:

i. Requiring water-conserving design and equipment in new construction.

ii. Encouraging water-conserving landscaping and irrigation methods.

1.10.7. Light and Glare

Policies

Policy 47. Ensure that light and glare from discretionary new development projects are minimized in rural as well as urban areas.

Policy 48. Encourage the use of low-glare lighting to minimize nighttime glare effects on neighboring properties.

Implementation Measures

Implementation Measure AA. The County shall utilize CEQA Guidelines and the provisions of the Zoning Ordinance to minimize the impacts of light and glare on adjacent properties and in rural undeveloped areas.

Chapter 2. Circulation Element

2.1 Introduction

Goals

Goal 4. Kern County will plan for a reduction of environmental effects without accepting a lower quality of life in the process.

Goal 5. Maintain a minimum [level of service] LOS D for all roads throughout the County unless the roads are part of an adopted Community Plan or Specific Plan which utilizes Smart Growth policies that encourage efficient multi-modal movements (See Section 1.10.8 of the Kern County General Plan).

2.3. Highways

2.3.3. Highway Plan

Goals

Goal 5. Maintain a minimum Level of Service (LOS) D.

2.3.4. Future Growth

Goals

Goal 1. To provide ample flexibility in this plan to allow for growth beyond the 20-year planning horizon.

Policies

Policy 2. The County should monitor development applications as they relate to traffic estimates developed for this plan. Mitigation is required if development causes affected roadways to fall below Level of Service (LOS) D. Utilization of the CEQA process would help identify alternatives to or mitigation for such developments. Mitigation could involve amending the Land Use, Open Space and Conservation Element to establish jobs/housing balance if projected trips in any traffic zone exceed trips identified for this Circulation Element. Mitigation could involve exactions to build offsite transportation facilities. These enhancements would reduce traffic congestion to an acceptable level.

Policy 4. As a condition of private development approval, developers shall build roads needed to access the existing road network. Developers shall build these roads to County standards unless improvements along state routes are necessary then roads shall be built to Caltrans standards. Developers shall locate these roads (width to be determined by the Circulation Plan) along centerlines shown on the circulation diagram map unless otherwise authorized by an approved Specific Plan Line. Developers may build local roads along lines other than those on the circulation diagram map. Developers would negotiate necessary easements to allow this.

Implementation Measures

Implementation Measure C. Project development shall comply with the requirements of the Kern County Zoning Ordinance, Land Division Ordinance, and Development Standards.

2.5. Other Modes

2.5.4. Transportation of Hazardous Materials

Goals

Goal 1. Reduce risk to public health from transportation of hazardous materials.

Policies

Policy 1. The commercial transportation of hazardous material, identification and designation of appropriate shipping routes will be in conformance with the adopted Kern County and Incorporated Cities Hazardous Waste Management Plan.

Policy 2. Kern County and affected cities should reduce use of County-maintained roads and city-maintained streets for transportation of hazardous materials.

Implementation Measures

Implementation Measure A. Roads and highways utilized for commercial shipping of hazardous waste destined for disposal will be designated as such pursuant to Vehicle Code Sections 31303 et seq. Permit applications shall identify commercial shipping routes they propose to utilize for particular waste streams.

Chapter 3. Noise Element

3.2. Noise Sensitive Areas

Goals

Goal 1. Ensure that residents of Kern County are protected from excessive noise and that moderate levels of noise are maintained.

Goal 2. Protect the economic base of Kern County by preventing the encroachment of incompatible land uses near known noise producing roadways, industries, railroads, airports, oil and gas extraction, and other sources.

Policies

Policy 1. Review discretionary industrial, commercial, or other noise-generating land use projects for compatibility with nearby noise-sensitive land uses.

Policy 2. Require noise level criteria applied to all categories of land uses to be consistent with the recommendations of the California Division of Occupational Safety and Health (DOSH).

Policy 3. Encourage vegetation and landscaping along roadways and adjacent to other noise sources in order to increase absorption of noise.

Policy 4. Utilize good land use planning principles to reduce conflicts related to noise emissions.

Policy 7. Employ the best available methods of noise control.

Implementation Measures

Implementation Measure A. Utilize zoning regulations to assist in achieving noise-compatible land use patterns.

Implementation Measure C. Review discretionary development plans, programs and proposals, including those initiated by both the public and private sectors, to ascertain and ensure their conformance to the policies outlined in this element.

Implementation Measure F. Require proposed commercial and industrial uses or operations to be designed or arranged so that they will not subject residential or other noise sensitive land uses to exterior noise levels in excess of 65 dB L_{dn} and interior noise levels in excess of 45 dB L_{dn}.

Implementation Measure J. Develop implementation procedures to ensure that requirements imposed pursuant to the findings of an acoustical analysis are conducted as part of the project permitting process.

Chapter 4. Safety Element

Goals

Goal 1. Minimize injuries and loss of life and reduce property damage.

4.2. General Policies and Implementation Measures, which Apply to More than One Safety Constraint

Policies

Policy 1. That the County's program of identification, mapping, and evaluating the geologic, fire, flood safety hazard areas, and significant concentrations of hydrogen sulfide in oilfield areas, presently under way by various County departments, be continued.

Implementation Measures

Implementation Measure A. All hazards (geologic, fire, and flood) should be considered whenever a Planning Commission or Board of Supervisor's action could involve the establishment of a land use activity susceptible to such hazards.

Implementation Measure F. The adopted multi-jurisdictional Kern County, California Multi-Hazard Mitigation Plan, as approved by FEMA, shall be used as a source document for preparation of environmental documents pursuant to CEQA, evaluation of project proposals, formulation of potential mitigation, and identification of specific actions that could, if implemented, mitigate impacts from future disasters and other threats to public safety.

4.3. Seismically Induced Surface Rupture, Ground Shaking, and Ground Failure

Implementation Measures

Implementation Measure B. Require geological and soils engineering investigations in identified significant geologic hazard areas in accordance with the Kern County Code of Building Regulations.

Implementation Measure C. The fault zones designated in the Kern County Seismic Hazard Atlas should be considered significant geologic hazard areas. Proper precautions should be instituted to reduce seismic hazard, whenever possible in accordance with state and County regulations.

4.5. Landslide, Subsidence, Seiche, and Liquefaction

Policies

Policy 1. Determine the liquefaction potential at sites in areas of shallow groundwater (Map Code 2.3) prior to discretionary development and determine specific mitigation to be incorporated into

the foundation design, as necessary, to prevent or reduce damage from liquefaction in an earthquake.

Policy 3. Reduce potential for exposure of residential, commercial, and industrial development to hazards of landslide, land subsidence, liquefaction, and erosion.

4.6. Wildland and Urban Fire

Policies

Policy 1. Require discretionary projects to assess impacts on emergency services and facilities.

Policy 3. The County will encourage the promotion of fire prevention methods to reduce service protection costs and costs to taxpayers.

Policy 4. Ensure that new development of properties have sufficient access for emergency vehicles and for the evacuation of residents.

Policy 6. All discretionary projects shall comply with the adopted Fire Code and the requirements of the Fire Department.

Implementation Measures

Implementation Measure A. Require that all development comply with the requirements of the Kern County Fire Department or other appropriate agency regarding access, fire flows, and fire protection facilities.

4.9. Hazardous Materials

Implementation Measures

Implementation Measure A. Facilities used to manufacture, store, and use of hazardous materials shall comply with the Uniform Fire Code, with requirements for siting or design to prevent onsite hazards from affecting surrounding communities in the event of inundation.

4.11. Abandoned Open Shafts and Wells

Policies

Policy 2. The County should protect residents from the hazards associated with development in areas where wells have been drilled and abandoned for exploration and/or production of oil and natural gas.

Implementation Measures

Implementation Measure B. Support the construction site review program of the Department of Oil, Gas, and Geothermal Resources that assures wells are precisely located, properly plugged and abandoned, and tested for leakage prior to development of the area.

Chapter 5. Energy Element

5.3.2. Kern County's Economic Dependence on the Oil Marketplace

Policies

Policy 3. The County shall encourage the conversion of existing petroleum-related facilities to other productive uses when they are no longer needed or productive.

Kern County Zoning Ordinance

Title 19 of the Kern County Ordinance provides a description of permitted uses for the various zoning classifications within the County. The Zoning Ordinance consists of two primary parts: a Zoning Map that delineates the boundaries of zoning districts, and a Zoning Code that explains the purpose of the districts, specifies permitted and conditional uses, and establishes development and performance standards. The intent of the Zoning Code is to protect public health, safety, and the general welfare of residents and visitors in the County. Together with the Zoning Map, the Zoning Code identifies the particular uses permitted on each parcel of land in the County and sets forth regulations and standards for development to ensure that the policies, goals, and objectives of the KCGP are implemented. In addition to land use regulations, the Zoning Code contains development standards that can lessen a new structure's impacts on a location or area. These standards control the height, setbacks, parking lot coverage, gross floor area, etc. for new structures. The Zoning Code also regulates which uses are permitted in each of the County's zoning districts to ensure compatibility between land uses.

4.11.4 Impacts and Mitigation Measures

Methodology

For the purposes of this analysis, relevant documents (particularly the KCGP and the Kern County Zoning Ordinance) were consulted, and a Google Earth visual survey of the project area was performed. A discussion of the project's consistency with plans and policies for each environmental topic area is summarized below and is described in greater detail in each of the relevant environmental topic sections (Sections 4.1 through 4.20).

Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist identify the following criteria, as established in Appendix G of the CEQA Guidelines, to determine if a project could potentially have a significant adverse effect on land use.

A project could have a have a significant adverse effect on land use if the project would:

a. Physically divide an established community;

b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted to avoid or mitigate an environmental effect.

Impacts and Mitigation Measures

Impact 4.11-1: Physically Divide an Established Community

There would be no impacts because there are no established residential communities in the project area. The use of all new CCS facilities, including wells, pipelines, and ancillary infrastructure, would be considered compatible land use because they would be operated in areas in which oil and gas activity is currently the primary land use. Furthermore, the project does not have the potential to create a physical barrier in the middle of an existing community because the CSS facilities are not considered large barrier structures. The CSS facilities would be constructed in an area where there are no established communities. Therefore, the project would not result in the physical division of an established community. No impacts would result.

Mitigation Measures

No mitigation measures are required.

Level of Significance

No impact would occur.

Impact 4.11-2: Conflict with Any Applicable Land Use Plan, Policy, or Regulation Adopted for the Purpose of Avoiding or Mitigating an Environmental Effect

The KCGP and the Kern County Zoning Ordinance establish land use policies and regulations, adopted to avoid or mitigate an environmental effect, that are applicable to the project. The following discussion evaluates the project's consistency with these plans, policies, and regulations in the lands for which the County has jurisdiction. Implementation of the project would require approval of CUPs. and changes in zone districts for KCGP consistency and conformance to the Alternative to Determination of Similar Use.

The proposed project would be consistent with plans, policies, and goals of the KCGP, as analyzed in Table 4.11-4.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
KERN COUNTY GENERAL PLAN	
CHAPTER 1. LAND USE, OPEN SPACE, AND CONSERVATION ELEMENT	
1.2 NON-JURISDICTIONAL LAND	
Goal 1. To promote harmonious and mutually beneficial uses of land among the various jurisdictions and land management entities present in Kern County.	CONSISTENT. The project promotes harmonious and mutually beneficial uses among various jurisdictions because the project proposes a use that is consistent with the existing land use of the project area.
Policy 3. The County retains the maximum discretion allowed by law over land use issues of local concern, which impact the development of private and public property in the County.	CONSISTENT. The project maintains the County's authority over land use issues. The County is exercising its discretion over land use issues by processing and considering at a public hearing a Conditional Use Permit for a Carbon Capture and Storage Facility within its jurisdiction.
Policy 6. The County will solicit a city's comments on land use planning proposals within the city's adopted sphere of influence or within one mile of the city limits, whichever is greater.	CONSISTENT. With the publication of the NOP, the County notified all local governments within the project Area to solicit comments.
1.3 PHYSICAL AND ENVIRONMENTAL CONSTRAINTS	
Goal 1. To strive to prevent loss of life, reduce personal injuries, and property damage, minimize economic and social diseconomies resulting from natural disaster by directing development to areas which are not hazardous.	CONSISTENT. Consistent with this policy, the project would develop a CO_2 capture site and associated facilities that are not located on a hazardous site. See Section 4.9, *Hazards and Hazardous Materials*, of this EIR. As described in Section 4.7, *Geology and Soils*, of this EIR, the project site is not transected by a known active or potentially active fault and is not located within a State of California Alquist-Priolo Earthquake Fault Zone. Adherence to all applicable regulations and mitigation would reduce potential impacts associated with fault rupture adjacent to the proposed project site. Based on the absence of any known active faults that cross, or are located in close proximity to, the project site and project compliance with applicable ordinances of the Kern County Building Code, and compliance with MM 4.7-1, the potential impact of fault rupture would be less than significant. Additionally, the proposed project would implement all other recommendations of the final design level geotechnical report. The final report's recommendations would be consistent with the Kern County Building Code (Chapter 17.08) and the most recent version of the California Building Code. As described in Section 4.10, *Hydrology and Water Quali*ty, of this EIR, the project area is located in three FIRM areas designated as Zone A and X. Zone A indicates areas of the 100-year flood where base flood elevations are not known, and Zone X indicates areas that experience minimal flooding. Implementation of MM 4.10-

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
	2 would require preparation of a drainage plan that would design project facilities to have 1 foot of freeboard clearance above the calculated maximum flood depths for the finished floor of any permanent structures and grading for the project would be designed so that water surface elevations during flood events would not be increased by more than 1 foot. Further, the project would be developed in accordance with the General Plan and Floodplain Management Ordinance. Thus, final review of the proposed project by the Kern County Planning and Natural Resources Department, as well as adherence to all applicable local, state, and federal regulations, would ensure that the proposed project would not pose significant environmental or public health and safety hazards. As such, with the implementation of mitigation measures the project would be consistent with this goal.
Policy 1. Kern County will ensure that new developments will not be sited on land that is physically or environmentally constrained ((Map Code 2.1 (Seismic Hazard), Map Code 2.2 (Landslide), Map Code 2.3 (Shallow Groundwater), Map Code 2.5 (Flood Hazard), Map Codes from 2.6 – 2.9, Map Code 2.10 (Nearby Waste Facility), and Map Code 2.11 (Burn Dump Hazard)) to support such development unless appropriate studies establish that such development will not result in unmitigated significant impact.	CONSISTENT. See 1.3, Physical and Environmental Constraints, Goal 1, of the KCGP, above.
Policy 3. Zoning and other land use controls will be used to regulate and, in some instances, to prohibit development in hazardous areas.	CONSISTENT. Hazards and hazardous materials impacts are evaluated in Section 4.9, *Hazards and Hazardous Materials*, of this EIR. Consistent with this policy, the project would comply with the requirements of the Kern County Zoning Ordinance, Land Division Ordinance, and Development Standards.
Policy 8. Encourage the preservation of the floodplain's flow conveyance capacity, especially in floodways, to be open space/passive recreation areas throughout the County.	CONSISTENT. See Section 4.10, *Hydrology and Water Quality*, of this EIR, the project would be developed in accordance with the KCGP, Floodplain Management Ordinance and would implement MM 4.10-1 and MM 4.10-2, as described in that section.
Policy 9. Construction of structures that impede water flow in a primary floodplain will be discouraged.	CONSISTENT. See Section 4.10, *Hydrology and Water Quality*, of this EIR, the project would be developed in accordance with the KCGP, Floodplain Management Ordinance and would implement MM 4.10-1 and MM 4.10-2, as described in that section.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
Policy 10. The County will allow lands which are within flood hazard areas, other than primary floodplains, to be developed in accordance with the General Plan and Floodplain Management Ordinance, if mitigation measures are incorporated so as to ensure that the proposed development will not be hazardous within the requirements of the Safety Element (Chapter 4) of this General Plan.	CONSISTENT See Section 4.10, *Hydrology and Water Quality*, of this EIR, the project would be developed in accordance with the KCGP, Floodplain Management Ordinance and would implement MM 4.10-1 and MM 4.10-2.
Policy 11. Protect and maintain watershed integrity within Kern County.	CONSISTENT. See 1.3, Physical and Environmental Constraints, Goal 1 and Policy 9 of the KCGP, above. As discussed in Section 4.10, *Hydrology and Water Quality*, of the EIR, the project site would implement BMPs during construction to avoid impacts on water quality. As described in Section 4.9, *Hazards and Hazardous Materials*, of this EIR, the project would also implement MM 4.9-1, which would require the project proponent to provide a Hazardous Materials Business Plan to reduce mixing of pollutants with stormwater on site, thereby maintaining the integrity of the watershed.
Implementation Measure D. Review and revise the County's current Grading Ordinance as needed to ensure that its standards minimize permitted topographic alteration and soil erosion while maintaining soil stability.	CONSISTENT. See 1.3, Physical and Environmental Constraints, Goal 1 and Policy 9 and Policy 11 of the KCGP, above. The project would implement MM 4.10-1 and M M 4.10-2, which would require the preparation of a SWPPP, which would require the project operator to conform to the requirements of Kern County's NPDES Program and that would include erosion control and sediment control BMPs designed to prevent disturbed soils from moving off site. A hydrologic study also would be prepared that would include the designs for a drainage plan that would minimize the potential for changes in the existing drainage patterns to increase erosion and sedimentation. A grading permit would be obtained from the County prior to the commencement of construction activities. Compliance with Chapter 17.28 of the Kern County Grading Ordinance would ensure both structural and nonstructural BMPs.
Implementation Measure F. The County will comply with the Colbey-Alquist Floodplain Management Act in regulating land use within designated floodways.	CONSISTENT. See 1.3, Physical and Environmental Constraints, Goal 1 and Policy 9 and Policy 11 of the KCGP, above, and Section 4.10 *Hydrology and Water Quality*. The project facilities would be designed to maintain clearance above the maximum flood depths and grading would not substantially increase flooding depths. Further, the project would be developed in accordance with the KCGP, Floodplain Management Ordinance and MM 4.10-1 and MM 4.10-2. Therefore, the project would be consistent with this measure.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
Implementation Measure H. Development within areas subject to flooding, as defined by the appropriate agency, will require necessary flood evaluations and studies.	CONSISTENT. See 1.3, Physical and Environmental Constraints, Goal 1 and Policy 9 and Policy 11 of the KCGP, above and Section 4.10 *Hydrology and Water Quality* of this EIR, the project would be developed in accordance with the KCGP, Floodplain Management Ordinance and MM 4.10-1 and MM 4.10-2.
Implementation Measure J. Compliance with the Floodplain Management Ordinance prior to grading or improvement of land for development or the construction, expansion, conversion or substantial improvements of a structure is required.	CONSISTENT. See 1.3, Physical and Environmental Constraints, Goal 1 and Policy 9, Policy 11, and Measure H, of the KCGP, above.
Implementation Measure N. Applicants for new discretionary development should consult with the appropriate Resource Conservation District and the California Regional Water Quality Control Board regarding soil disturbances issues.	CONSISTENT. See 1.3, Physical and Environmental Constraints, Policy 11 and Measure D of the KCGP, above. The project would implement BMPs in accordance with a SWPPP that would be required to comply with Kern County's NPDES. This would ensure compliance with the State Water Resources Control Board's Construction General Permit, as applicable
1.4 PUBLIC FACILITIES AND SERVICES	
Goal 1. Kern County residents and businesses should receive adequate and cost effective public services and facilities. The County will compare new urban development proposals and land use changes to the required public services and facilities needed for the project.	CONSISTENT. As discussed in Section 4.15, *Public Services* of this EIR, the project would implement MM 4.15-3 to provide a CIC to provide funding to offset the regional impacts on County services as the surface uses must be restricted for the CCS projects on known project surface land that if approved, cannot be developed for uses that pay property taxes to support all County service. Further, MM 4.15-4 would provide annual funding for the fire department and MM 4.15-5 would provide for funding for County services at the end of injection activities.
Goal 5. Ensure that adequate supplies of quality (appropriate for intended use) water are available to residential, industrial, and agricultural users within Kern County.	CONSISTENT. As discussed in Section 4.19, *Utilities and Service Systems*, of this EIR, a project-specific water supply assessment was prepared for the project. Based on estimated project construction and operational water demands per the report, there is sufficient water available to meet the projected water demands of the project. However, water supplies have the potential to be adversely affected if the project in the future demands more water than is available. Therefore, the project would implement MM 4.19-1 to ensure that any groundwater or reclaimed water used is regulated to ensure that the project would have sufficient water supplies to serve the project and reasonably foreseeable future development.
Goal 9. Serve the needs of industries and Kern County residents in a manner that does not degrade the water supply and the environment and protect the public health	CONSISTENT. As discussed in Section 4.10, *Hydrology and Water Quality*, the operator shall comply with all applicable federal, state, regional, and local agency water quality protection laws and regulations, and commonly utilized industry

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
and safety by avoiding surface and subsurface nuisances resulting from the disposal of hazardous wastes, irrespective of the geographic origin of the waste.	standards, including obtaining all applicable stormwater construction permits from the Central Valley Regional Water Quality Control Board. The operator would also implement BMPs, such as those set forth in the Kern County Grading Ordinance. In addition, because project construction would cause more than 1 acre of ground disturbance, the project would implement MM 4.10-1 through MM 4.10-3 requiring a SWPPP to prevent the occurrence of soil erosion and discharge of other construction-related pollutants that could contaminate water quality within any areas of the project. Per MM 4.10-4 and MM 4.10-5, the Underground Injection Control program would prevent discharge into any underground source of current or future beneficial use groundwater. Injection of CO_2 into the ground via injection well would not mix with or contaminate groundwater. Therefore, operation of the project would not violate water quality standards, waste discharge requirements, or degrade surface or water quality in the area.
Policy 1. New discretionary development will be required to pay its proportional share of the local costs of infrastructure improvements required to service such development	CONSISTENT. The project would construct and operate a CCS facility and associated facilities. All infrastructure improvements associated with the project would be fully funded by the project proponent. No further improvements are anticipated as a part of the project. However, should improvements be made, the project proponent would coordinate with the County to ensure that the cost of the infrastructure improvement is properly funded. As discussed in Section 4.15, *Public Services*, the project would implement MM 4.15-3 to provide a CIC to offset the regional impacts on County services as the surface uses must be restricted for the CCS projects on known project surface land that if approved, cannot be developed for uses that pay property taxes to support all County services. The project would also implement MM 4.15-4 to ensure that the cost of emergency preparation in the event of CO_2 release is fully funded and MM 4.15-5 to ensure that all requirements, including payments, have been met prior to final closure of the facility.
Policy 3. Individual projects will provide availability of public utility service as per approved guidelines of the serving utility.	CONSISTENT. Public utility impacts are evaluated in Section 4.19, *Utilities and Service Systems*, of the EIR. As described therein, the project would have less-than-significant impacts on water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities. However, regarding water supplies, the project has the potential to adversely affect groundwater or reclaimed water reserves if the project in the future demands more water than is

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
	available. The project would implement MM 4.19-1 to ensure that any groundwater or reclaimed water used is accounted for and regulated.
Policy 6. The County will ensure adequate fire protection to all Kern County residents	CONSISTENT. See 1.4, Public Services and Facilities, Goal 1, above. The project would implement MM 4.15-3 to provide a CIC to offset the regional impacts on County services as the surface uses must be restricted for the CCS projects on known project surface land that if approved, cannot be developed for uses that pay property taxes to support all County services.
Policy 7. The County will ensure adequate police protection to all Kern County residents.	CONSISTENT. See 1.4, Public Services and Facilities, Goal 1, above. The project would implement MM 4.15-3 to provide a CIC to offset the regional impacts on County services as the surface uses must be restricted for the CCS projects on known project surface land that if approved, cannot be developed for uses that pay property taxes to support all County services.
Policy 15. Prior to approval of any discretionary permit, the county shall make the finding, based on information provided by the CEQA documents, staff analysis, and the applicant, that adequate public or private services and resources are available to serve the proposed development.	CONSISTENT. Consistent with this goal, the project requires consideration and approval of a CUP, as well as other discretionary actions that ensure compliance with all policies. The project would implement MM 4.15-3 to provide a CIC to offset the regional impacts on County services as the surface uses must be restricted for the CCS projects on known project surface land that if approved, cannot be developed for uses that pay property taxes to support all County services.
Implementation Measure B. Determine local costs of county facility and infrastructure improvements and expansion which are necessitated by new development of any type and prepare a schedule of charges to be levied on the developer at the site of approval of the Final Map. This implementation can be effectuated by the formation of a county work group.	CONSISTENT. See 1.4, Public Services and Facilities, Goal 1, above. Though the project would require no new fire protection, law enforcement protection, or public facilities to accommodate the proposed project, the project could increase demand for such facilities in the future. Therefore, the project would implement MM 4.15-1 through MM 4.15-5 requiring the project proponent to coordinate with the County to ensure that the cost of the infrastructure improvement is properly funded by the project.
Implementation Measure C. Project developers shall coordinate with the local utility service providers to supply adequate public utility services.	CONSISTENT. Project effects related to utilities are discussed in Section 4.19, *Utilities and Service Systems*, of this EIR. The project would result in less than significant impacts on utilities.
Implementation Measure L. Prior to the approval of development projects, the county shall determine the need for fire protection services. New development in the county shall not be approved unless adequate fire protection facilities and resources can be provided.	CONSISTENT. Impacts to fire protection services are evaluated in Section 4.15, *Public Services*, of this EIR. The project would implement MM 4.15-3, to provide an annual payment to the fire department for special training and equipment for emergency response.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
Implementation Measure N. Secure complete and accurate information on all hazardous wastes generated, handled, stored, treated, transported, and disposed of within or through Kern County.	CONSISTENT. Chapter 3, *Project Description* and Section 4.9, *Hazards and Hazardous Materials* of this EIR describes hazardous wastes generated, handled, stored, treated, transported, and disposed of with respect to CCS development in the project area.
1.9 RESOURCE	
Goal 1. To contain new development within an area large enough to meet generous protections of foreseeable need, but in locations that will not impair the economic strength derived from the petroleum, agriculture, rangeland, or mineral resources or diminish the other amenities that exist in the County.	CONSISTENT. The project site is located on land that is zoned as A (Exclusive Agriculture) and A-1 (Limited Agriculture), which still allows for agricultural uses "by right" within the project area. This means that the project area could potentially be leased for agricultural or farming purposes. The project would implement MM 4.2-1 to reduce impacts on agricultural or farming operations if the project area is leased for those purposes during project implementation. The project would not involve additional changes in the existing environment besides those described in this EIR and would not directly lead to other projects that would result in the loss of grazing or cultivation land. While the project site has been used for oil extraction, and there is an oil/gas facility within the project boundaries, the project would not interfere with current oil and mineral extraction operations and the existing well would not be disturbed or removed as part of the project. As described in Section 4.12, *Mineral Resources,* of this EIR the project would, however, preclude EOR within the project area.
Goal 2. Protect areas of important mineral, petroleum, and agricultural resource potential for future use.	CONSISTENT. See 1.9, Resource, Goal 1, above. As discussed in Section 4.12, *Mineral Resources*, of the EIR, the project site is designated as MRZ 3 (where known or inferred mineral occurrences of undetermined mineral resource significance are present) by the Conservation's State Mining and Geology Board. Implementation of the project would result in the loss of oil exploration and extraction with over 200 wells abandoned for project implementation. Further use of EOR, is prohibited by law. The project would result in a significant and unavoidable impact.
Goal 3. Ensure the development of resource areas minimize effects on neighboring resource lands.	CONSISTENT. The project is compatible with open space and other resource management land uses. Furthermore, the placement of facilities at the project site may deter other urban and suburban land uses from being developed nearby. The project would not preclude the existing nearby agricultural, mineral, and petroleum extraction uses from operating.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
Goal 4. Encourage safe and orderly energy development within the county, including research and demonstration projects, and to become actively involved in the decision and actions of other agencies as they affect energy development in Kern County.	CONSISTENT. The project would develop CO_2 capture sites and associated facilities. The location of the site would ensure a safe and orderly development of the project facilities. Additionally, the NOP of this EIR was sent to state and federal agencies requesting their input to ensure that appropriate information about the project site were being gathered. Similarly, this EIR will also be circulated to these agencies, and staff will have the opportunity to comment on the environmental analyses. Therefore, the County is complying with this goal for the project.
Policy 1. Appropriate resource uses of all types will be encouraged as desirable and consistent interim uses in undeveloped portions of the county regardless of General Plan designation.	CONSISTENT. The project would allow the continued use of the site and is surrounding adjacent parcels for both agricultural uses and oil and gas exploration.
Policy 7. Areas designated for agricultural use, which include Class I and II and other enhanced agricultural soils with surface delivery water systems, should be protected from incompatible residential, commercial, and industrial subdivision and development activities.	CONSISTENT. See 1.9, Resource, Goal 2, of the KCGP, above.
Policy 10. To encourage effective groundwater resource management for the long-term economic benefit of the county, the following shall be considered: (a) Promote groundwater recharge activities in various zone districts. (b) Support for the development of Urban Water Management Plans and promote Department of Water Resources grant funding for all water providers. (c) Support the development of groundwater management plans. (d) Support the development of future sources of additional surface water and groundwater, including conjunctive use, recycled water, conservation, additional storage of surface water and groundwater, and desalination.	CONSISTENT. As discussed in Section 4.10, *Hydrology and Water Quality*, the operator would implement a SWPPP, which would reduce impacts on groundwater. In addition, the project would not hinder County efforts to develop Urban Water Management Plans, promote Department of Water Resources grant funding, develop groundwater management plans, or develop future sources of additional surface and groundwater.
Policy 11. Minimize the alteration of natural drainage areas. Require development plans to include necessary mitigation to stabilize runoff and silt deposition through utilization of grading and flood protection ordinances.	CONSISTENT. See 1.3, Physical and Environmental Constraints, Policy 11 and Measure D and Measure N of the KCGP, above. The project would not result in the removal or alteration of any drainages.
Policy 14. Emphasize conservation and development of identified mineral deposits.	CONSISTENT. As discussed in Section 4.12, *Mineral Resources*, of this EIR, and See 1.9, Resource, Goal 1, 3, and 5. While the project would impede the use of the site of oil and gas exploration, this alternative use of the underground pore space has been determined to be constitute with utilization of mineral deposit (oil and gas) areas.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
Policy 25. Discourage incompatible land use adjacent to Map Code 8.4 (Mineral and Petroleum) areas.	CONSISTENT. See 1.9, Resource, Policy 14, of the KCGP, above.
Implementation Measure B. Areas designated as Resource Reserve (Map Code 8.2), Extensive Agriculture (Map Code 8.3), Resource Management (Map Code 8.5) that are under Williamson Act Contracts or Farmland Security Zone Contracts will have a minimum parcel size of 80 acres until such time as a contract is expired or is cancelled, at which time the minimum parcel size will become 20 acres**.**	CONSISTENT. One parcel within the CUP boundary is subject to Williamsons Act contract and two parcels are subject to Farmland Security Zone Contract. However, there will be no project-related surface areas or ground disturbances within these parcels and, therefore, there will be no conflict with the ongoing activities related to grazing and agriculture in these parcels. The project, therefore, is consistent with this policy.
Implementation Measure C. The County Planning Department will seek review and comment from the County Engineering and Survey Services Department on the implementation of the National Pollution Discharge Elimination System for all discretionary projects.	CONSISTENT. As discussed in Section 4.10, *Hydrology and Water Quality*, construction activities in the project area that could result in a discharge to waters of the United States are subject to the California NPDES General Construction Permit (General Construction Activity NPDES Storm Water Permit, 2009-0009-DWQ and 2010-0014-DWQ).
Implementation Measure F. Prime agricultural lands, according to the Kern County Interim- Important Farmland map produced by the Department of Conservation, which have Class I or II soils and a surface delivery water system shall be conserved through the use of agricultural zoning with minimum parcel size provisions.	CONSISTENT. According to the California DOC Farmland Mapping and Monitoring Program, no Prime farmland is present on the project site; the majority of the site is designated as Vacant or Disturbed Land, Nonagricultural and Natural Vegetation, Grazing, and Urban and Built-Up Land.
Implementation Measure G. Property placed under the Williamson Act/Farmland Security Zone Contract must be in a Resource designation**.**	CONSISTENT. See 1.9, Resource, Goal 2, of the KCGP, above.
Implementation Measure H. Use the California Geological Survey's latest maps to locate mineral deposits until the regional and Statewide importance mineral deposits map has been completed, as required by the Surface Mining and Reclamation Act.	CONSISTENT. See 1.9, Resource, Goal 1, and Goal 2 and Policy 14, of the KCGP, above.
1.10 GENERAL PROVISIONS	
Goal 1. Ensure that the County can accommodate anticipated future growth and development while maintaining a safe and healthful environment and a prosperous economy by preserving valuable natural resources, guiding development away from hazardous areas, and assuring the provision of adequate public services.	CONSISTENT. Consistent with this goal, the project requires consideration and approval of a CUP, as well as other discretionary actions that ensure compliance with all policies. The project would implement MM 4.15-3 to provide a CIC to offset the regional impacts on County services as the surface uses must be restricted for the CCS projects on known project surface land that if approved cannot be developed for uses that pay property taxes to support all County services.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
1.10.1 PUBLIC SERVICES AND FACILITIES	
Policy 9. New development should pay its pro rata share of the local cost of expansions in services, facilities, and infrastructure which it generates and upon which it is dependent.	CONSISTENT. See 1.4, Public Facilities and Services, Goal 1, above.
Policy 15. Prior to approval of any discretionary permit, the County shall make the finding, based on information provided by the California Environmental Quality Act (CEQA) documents, staff analysis, and the applicant, that adequate public or private services and resources are available to serve the proposed development.	CONSISTENT. Consistent with this goal, the project requires consideration and approval of a CUP as well as other discretionary actions that ensure compliance with all policies. The project would implement MM 4.15-3 to provide a CIC to offset the regional impacts on County services as the surface uses must be restricted for the CCS projects on known project surface land that if approved cannot be developed for uses that pay property taxes to support all County services. The project would also implement MM 4.15-4 to ensure that the cost of emergency preparation in the event of CO_2 release is fully funded and MM 4.15-5 to ensure that all requirements, including payments, have been met prior to final closure of the facility.
Policy 16. The developer shall assume full responsibility for costs incurred in service extensions or improvements that are required to serve the project. Cost sharing or other forms of recovery shall be available when the service extensions or improvements have a specific quantifiable regional significance.	CONSISTENT. See 1.4, Public Facilities and Services, Goal 1, Policy 1, and Policy 15, above.
Implementation Measure C. project developers shall coordinate with the local utility service providers to supply adequate public utility services.	CONSISTENT. See 1.4, Public Facilities and Services, Policy 9, above.
Implementation Measure D. Involve utility providers in the land use and zoning review process.	CONSISTENT. See 1.4, Public Facilities and Services, Policy 9, above.
Implementation Measure E. All new discretionary development projects shall be subject to the Standards for Sewage, Water Supply, and Preservation of Environmental Health Rules and Regulations administered by the Environmental Health Services Department. Those projects having percolation rates of less than five minutes per inch shall provide a preliminary soils study and site specific documentation that characterizes the quality of upper groundwater in the project vicinity and evaluation of the extent to which, if any, the proposed use of alternative septic systems will adversely impact groundwater quality. If the evaluation indicates that the uppermost groundwater at the proposed site already exceeds groundwater quality objectives of the Regional Water Quality Control Board, or would if the	CONSISTENT. See 1.4, Public Facilities and Services, Goal 5. Water and wastewater impacts are evaluated in Section 4.10, *Hydrology and Water Quality*, and Section 4.19, *Utilities and Service Systems*, of this EIR. No off-site water or sewage connections to municipal systems are proposed. During construction and operation, portable toilets and hand washing facilities are proposed. Final review of the project by the Kern County Planning and Natural Resources Department, as well as adherence to all applicable local, state, and federal regulations, would ensure that the project would not pose significant environmental or public health and safety hazards.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
alternative septic system is installed, the applicant shall be required to supply sewage collection, treatment, and disposal facilities.	
1.10.2 AIR QUALITY	
Policy 18. The air quality implications of new discretionary land use proposals shall be considered in approval of major developments. Special emphasis will be placed on minimizing air quality degradation in the desert to enable effective military operations and in the valley region to meet attainment goals.	CONSISTENT. Air quality and greenhouse gas impacts are evaluated in Sections 4.3, *Air Quality*, and 4.8, *Greenhouse Gas Emissions*, of this EIR. Consistent with this policy, the proposed project would implement MM 4.3-1 through MM 4.3-9, which would reduce impacts on air quality to the extent feasible. Air quality mitigation measures include diesel emission reduction measures during construction, fugitive dust control measures, and Valley Fever exposure minimization measures.
Policy 19. In considering discretionary projects for which an Environmental Impact Report must be prepared pursuant to the California Environmental Quality Act, the appropriate decision making body, as part of its deliberations, will ensure that: (a) All feasible mitigation to reduce significant adverse air quality impacts have been adopted; and (b) The benefits of the project outweigh any unavoidable significant adverse effects on air quality found to exist after inclusion of all feasible mitigation. This finding shall be made in a statement of overriding considerations and shall be supported by factual evidence to the extent that such a statement is required pursuant to the California Environmental Quality Act.	CONSISTENT. See 1.10.2, Air Quality, Policy 18, above. This EIR serves to comply with this policy. The project cannot reduce impacts to less than significant, even with required mitigation. Appropriate findings under CEQA would be required to be made by the decision-makers to approve the project despite the significant and unavoidable cumulative impacts on air quality.
Policy 20. The County shall include fugitive dust control measures as a requirement for discretionary projects and as required by the adopted rules and regulations of the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District on ministerial permits.	CONSISTENT. Air quality impacts are evaluated in Section 4.3, *Air Quality*, of this EIR. As discussed therein, implementation of MM 4.3-2 would further reduce fugitive dust emissions during construction and operation, in compliance with the adopted rules and regulations of the San Joaquin Valley Air Pollution Control District on ministerial permits.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
Policy 21. The County shall support air districts' efforts to reduce PM10 and PM2.5 emissions.	CONSISTENT. See 1.10.2, Air Quality, Policy 20, above air quality impacts are evaluated in Section 4.3, *Air Quality*, of this EIR. As discussed in that section, implementation of MM 4.3-8 would further reduce particulate matter of 10 microns or less and particulate matter of 2.5 microns or less emissions during construction and operation.
Policy 22. Kern County shall continue to work with the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District toward air quality attainment with federal, state, and local standards.	CONSISTENT. Air quality impacts are evaluated in Section 4.3, *Air Quality*, of this EIR. Consistent with this policy, the proposed project would implement MM 4.3-1 through MM 4.3-9, which would reduce impacts on air quality to the extent feasible. The project would comply with all applicable San Joaquin Valley Air Pollution Control District rules and regulations.
Implementation Measure F. All discretionary permits shall be referred to the appropriate air district for review and comment.	CONSISTENT. Air quality impacts are evaluated in Section 4.3, *Air Quality*, of this EIR. Consistent with this measure, the necessary discretionary permits would be referred to the San Joaquin Valley Air Pollution Control District for review and comment.
Implementation Measure G. Discretionary development projects involving the use of tractor trailer rigs shall incorporate diesel exhaust reduction strategies including: • Minimizing idling time. • Electrical overnight plug-ins.	CONSISTENT. Air quality impacts are evaluated in Section 4.3, *Air Quality*, of this EIR. Consistent with this measure, implementation of MM 4.3-3 and MM 4.3-4 would require diesel exhaust reduction strategies.
Implementation Measure H. Discretionary projects may use one or more of the following to reduce air quality effects: a. Pave dirt roads within the development. b. Pave outside storage areas. c. Provide additional low Volatile Organic Compounds (VOC) producing trees on landscape plans. d. Use of alternative fuel fleet vehicles or hybrid vehicles. e. Use of emission control devices on diesel equipment. f. Develop residential neighborhoods without fireplaces or with the use of Environmental Protection Agency certified, low emission natural gas fireplaces. g. Provide bicycle lockers and shower facilities on site.	CONSISTENT. See 1.10.2, Air Quality, Policies 18 through 21, above. This EIR serves to comply with this policy.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
h. Increasing the amount of landscaping beyond what is required in the Zoning Ordinance (Chapter 19.86). i. The use and development of park and ride facilities in outlying areas. j. Other strategies that may be recommended by the local Air Pollution Control Districts.	
Implementation Measure J. The County should include PM10 control measures as conditions of approval for subdivision maps, site plans, and grading permits.	See 1.10.2, Air Quality, Policies 18 through 21, above. This EIR serves to comply with this policy.
1.10.3 ARCHAEOLOGICAL, PALEONTOLOGICAL, CULTURAL, AND HISTORICAL PRESERVATION	
Policy 25. The County will promote the preservation of cultural and historic resources which provide ties with the past and constitute a heritage value to residents and visitors.	CONSISTENT. Cultural resource impacts are evaluated in Section 4.5, *Cultural Resources*, of this EIR. This EIR serves to comply with this policy and includes MM 4.5-1 through MM 4.5-3 to promote the preservation of cultural and historic resources where necessary.
Implementation Measure L. The County shall address archaeological and historical resources for discretionary projects in accordance with the California Environmental Quality Act (CEQA).	CONSISTENT. See 1.10.3, Archaeological, Paleontological, Cultural, and Historical Preservation, Policy 25. Cultural resource impacts are evaluated in Section 4.5, *Cultural Resources*, of this EIR. Consistent with this measure, impacts to archaeological and historical resources are evaluated in accordance with CEQA. This EIR serves to comply with this policy.
Implementation Measure M. In areas of known paleontological resources, the County should address the preservation of these resources where feasible.	CONSISTENT. Paleontological resource impacts are evaluated in Section 4.7, *Geology and Soils*, of this EIR. MM 4.7-5 and MM 4.7-6, which would reduce potential impacts on known paleontological resources through hiring a qualified paleontologist shall be retained to monitor all ground-disturbing activity, document, and implement measures as needed.
Implementation Measure N. The County shall develop a list of Native American organizations and individuals who desire to be notified of proposed discretionary projects. This notification will be accomplished through the established procedures for discretionary projects and CEQA documents.	CONSISTENT. Tribal cultural resource impacts are evaluated in Section 4.18, *Tribal Cultural Resources*, of this EIR. Consistent with this measure, notification regarding the proposed project was accomplished in accordance with AB52 and the established procedures for discretionary projects and CEQA documents in the County. Outreach letters were sent to appropriate contacts of California Native American Tribes affiliated with the geographic area of the project on April 14, 2022.
Implementation Measure O. On a project specific basis, the County Planning Department shall evaluate the necessity for the involvement of a qualified Native	CONSISTENT. Cultural resource impacts are evaluated in Section 4.5, *Cultural Resources,* of this EIR. This EIR serves to comply with this measure and includes MM 4.5-1 through MM 4.5-3, which would require consultation with the

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
American monitor for grading or other construction activities on discretionary projects that are subject to a CEQA document.	monitors or Native American monitor(s) and to conduct cultural resources sensitivity training for all personnel working on the project.
1.10.5 THREATENED AND ENDANGERED SPECIES	
Goal 1. Ensure that the County can accommodate anticipated future growth and development while a safe and healthful environment, and a prosperous economy by preserving valuable natural resources, guiding development away from hazardous areas, and assuring the provision of adequate public services.	CONSISTENT. As discussed in Section 4.4, *Biological Resources*, of this EIR, the project would potentially impact special-status plant and wildlife species. To preserve these valuable natural resources, the project would implement MM 4.4-1 through MM 4.4-21. Impacts on jurisdictional waters would be less than significant under the proposed project with implementation of MM 4.4-22 and MM 4.4-23. Those mitigation measures would require a Jurisdictional Delineation report (if applicable) and a Report of Waste Discharge with the RWQCB to obtain Waste Discharge Requirements (if applicable), and the Owner/operator shall also consult with CDFW on the need for a streambed alteration agreement. See 1.3, Physical and Environmental Constraints, Goal 1 and Policy 9 and Policy 11 of the KCGP, above and Section 4.10, *Hydrology and Water Quality,* of this EIR. The project would be constructed in consideration of the floodplain and the KCGP, Floodplain Management Ordinance and MM 4.10-1. As discussed in Section 4.9, *Hazards and Hazardous Materials*, MM 4.9-1 through MM 4.9-2 would reduce hazards impacts and involve waste and debris management, preparation of a hazardous materials business plan, limitations on herbicide use, and contamination of subsurface materials. As discussed in Section 4.15, *Public Services*, of this EIR, implementation of MMs 4.15-1 through MM 4.15-5 would require the project to pay a fee assigned by the Kern County Planning and Natural Resources Department over the life of the proposed facilities to mitigate any potential impacts on fire or facilities, resulting from the project. The mitigation would take the form of a CIC; allocation of sales and use taxes; and wherever feasible, require the project owner/operator to hire project employees from the local workforce. With the implementation of these mitigation measures, the project would be consistent with this measure.
Policy 27. Threatened or endangered plant and wildlife species should be protected in accordance with State and federal laws.	CONSISTENT. Biological resource impacts are evaluated in Section 4.4, *Biological Resources*, of this EIR. This EIR serves to comply with this policy and reduce potential impacts with mitigation. Additionally, the project would be developed and operated in accordance with all local, state, and federal laws pertaining to the preservation of sensitive species.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
Policy 28. County should work closely with State and federal agencies to assure that discretionary projects avoid or minimize impacts to fish, wildlife, and botanical resources.	CONSISTENT. Biological resource impacts are evaluated in Section 4.4, *Biological Resources*, of this EIR. This EIR serves to comply with this policy and reduce potential impacts with mitigation. As part of the biological resources evaluation and habitat assessment conducted for the project, relevant state and federal agencies were contacted to ensure that appropriate information about the project site were gathered. Specifically, an NOP of this EIR was sent to state and federal agencies requesting their input on the biological resource evaluation. Similarly, this EIR will also be circulated to these agencies, and staff will have the opportunity to comment on the biological resources evaluation. Therefore, the County is complying with this policy for the project.
Policy 29. The County will seek cooperative efforts with local, State, and federal agencies to protect listed threatened and endangered plant and wildlife species through the use of conservation plans and other methods promoting management and conservation of habitat lands.	CONSISTENT. Biological resource impacts are evaluated in Section 4.4, *Biological Resources*, of this EIR. The project site is consistent with the applicable plans and policies related to preservation, mitigations, and reduction of impacts on biological resources. Accordingly, implementation of MM 4.4-1 through MM 4.4-21 would further increase cooperative efforts with local, State, and federal agencies to support threatened and endangered plant and wildlife.
Policy 31. Under the provisions of the California Environmental Quality Act (CEQA), the County, as lead agency, will solicit comments from the California Department of Fish and Game and the U.S. Fish and Wildlife Service when an environmental document (Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report) is prepared.	CONSISTENT. See 1.10.5, Threatened and Endangered Species, Policy 27, 28, and 29, above.
Policy 32. Riparian areas will be managed in accordance with United States Army Corps of Engineers, and the California Department of Fish and Game rules and regulations to enhance the drainage, flood control, biological, recreational, and other beneficial uses while acknowledging existing land use patterns.	CONSISTENT. Biological resource impacts and impacts on riparian areas, are evaluated in Section 4.4, *Biological Resources*, of this EIR. Implementation of the biological resources mitigation measures such as MM 4.4-22 and MM 4.4-23 would ensure that project activities would not disturb state or federally regulated wetlands and waters unless the activity is specifically authorized by the issuance of permits or approvals as required by state and federal laws. The County will maintain open communication with all trustees and responsible agencies related to biological resources and will respond to all comments from reviewing agencies during the CEQA process.
Implementation Measure Q. Discretionary projects shall consider effects to biological resources as required by the California Environmental Quality Act.	CONSISTENT. Biological resource impacts are evaluated in Section 4.4, *Biological Resources*, of this EIR. Consistent with this measure, the evaluation of impacts to biological resources was performed in accordance with CEQA.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
Implementation Measure R. Consult and consider the comments from responsible and trustee wildlife agencies when reviewing a discretionary project subject to the California Environmental Quality Act.	CONSISTENT. Biological resource impacts are evaluated in Section 4.4, *Biological Resources*, of this EIR. Consistent with this measure, the project would implement mitigation measures that require consultation with the CDFW and USFWS. The County has and will respond to all comments from reviewing agencies during the CEQA process.
Implementation Measure S. Pursue the development and implementation of conservation programs with State and federal wildlife agencies for property owners desiring streamlined endangered species mitigation programs.	CONSISTENT. Biological resource impacts are evaluated in Section 4.4, *Biological Resources*, of this EIR. Consistent with this measure, the evaluation of impacts to biological resources was performed in accordance with CEQA.
1.10.6 SURFACE WATER AND GROUNDWATER	
Policy 34. Ensure that water quality standards are met for existing users and future development.	CONSISTENT. Water quality impacts are evaluated in Section 4.10, *Hydrology and Water Quality*, of this EIR. Consistent with this policy, the project would implement BMPs during construction to avoid impacts to water quality. The project would also implement a Hazardous Materials Business Plan to reduce the mixing of pollutants with stormwater on site, thereby maintaining the integrity of the watershed. In addition, per MM 4.10-1 in Section 4.10, *Hydrology and Water Quality*, of this EIR, the project would be required to implement a SWPPP, which would include BMPs designed to prevent the occurrence of soil erosion and discharge of other construction-related pollutants that could contaminate water quality and would be applicable to all areas of the project. In addition, prior to the commencement of construction activities, the project proponent would be required to adhere to the requirements of the Kern County Grading Code. This includes the implementation of various measures designed to prevent erosion and control drainage on site, thereby further preventing the potential sedimentation and subsequent degradation of stormwater.
Policy 39. Encourage the development of the County's groundwater supply to sustain and ensure water quality and quantity for existing users, planned growth, and maintenance of the natural environment.	CONSISTENT. As discussed in Section 4.10, *Hydrology and Water Quality*, the project does not impact the County's ability to develop its groundwater supply. However, because project construction would cause more than 1 acre of ground disturbance, applicable mitigation measures apply. The project would implement MM 4.10-1 through MM 4.10-3 requiring a SWPPP to prevent the occurrence of soil erosion and discharge of other construction-related pollutants that could contaminate water quality within any areas of the project. Per MM 4.10-4 and MM 4.10-5, the Underground Injection Control program would prevent discharge into any underground source of current or future beneficial use groundwater. Injection of CO_2 into the ground via injection well would not mix with or contaminate

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
	groundwater. Therefore, operation of the project would not violate water quality standards, waste discharge requirements, or degrade surface or water quality in the area
Policy 41. Review development proposals to ensure adequate water is available to accommodate projected growth.	CONSISTENT. Public utility impacts are evaluated in Section 4.19, *Utilities and Service Systems,* of the EIR. As described therein, the project would have less-than-significant impacts on water supplies. However, the project has the potential to adversely affect groundwater or reclaimed water reserves if the project in the future demands more water than is available. The project would implement MM 4.19-1 to ensure that any groundwater or reclaimed water used is accounted for and regulated.
Policy 43. Drainage shall conform to the Kern County Development Standards and the Grading Ordinance.	CONSISTENT. See 1.9, Resources, Policy 11, above
Policy 44. Discretionary projects shall analyze watershed impacts and mitigate for construction-related and urban pollutants, as well as alterations of flow patterns and introduction of impervious surfaces as required by the California Environmental Quality Act (CEQA), to prevent the degradation of the watershed to the extent practical.	CONSISTENT. Water quality impacts are evaluated in Section 4.10, *Hydrology and Water Quality*, of this EIR. Consistent with this measure, construction-related impacts related to alteration of flow patterns and impervious surfaces would be less than significant. In addition, the project would be required to submit a drainage plan to the County for review and would implement MM 4.10-2, which requires a final hydrologic study and drainage plan designed to evaluate and minimize potential increases in runoff from the project site.
Implementation Measure X. Encourage effective groundwater resource management for the long-term benefit of the County through the following: Promote groundwater recharge activities in various zone districts. Support the development of Groundwater Management Plans. Support the development of future sources of additional surface water and groundwater, including conjunctive use, recycled water, conservation, additional storage of surface water, and groundwater and desalination.	CONSISTENT. The applicant would be required to comply with mitigation measures that encourage groundwater resource management.
Implementation Measure Y. Promote efficient water use by utilizing measures such as: Requiring water-conserving design and equipment in new construction. Encouraging water-conserving landscaping and irrigation methods.	CONSISTENT. Public utility impacts are discussed in Section 4.19, *Utilities and Service Systems*, of the EIR. As discussed therein, the project would require water for dust suppression, fire protection, and pipeline hydrotesting. Water usage during construction, primarily for dust-suppression purposes, is not anticipated to exceed 400 acre-feet during the construction phase. The water would be trucked and stored on site and would not substantially decrease groundwater supplies within the Subbasin.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
1.10.7 LIGHT AND GLARE	
Policy 47. Ensure that light and glare from discretionary new development projects are minimized in rural as well as urban areas.	CONSISTENT. Aesthetic impacts are evaluated in Section 4.1, *Aesthetics and Visual Resources*, of this EIR. This EIR serves to comply with this policy and reduce potential impacts through implementation of mitigation measures. MM 4.1-5 would require compliance with the Dark Skies Ordinance (Chapter 19.81 of the Kern County Zoning Ordinance) and would result in the minimum illumination needed to achieve safety and security objectives.
Policy 48. Encourage the use of low-glare lighting to minimize nighttime glare effects on neighboring properties.	CONSISTENT. See 1.10.7, Light and Glare, Policy 47, above.
Implementation Measure AA. The County shall utilize CEQA Guidelines and the provisions of the Zoning Ordinance to minimize the impacts of light and glare on adjacent properties and in rural undeveloped areas.	CONSISTENT. See 1.10.7, Light and Glare, Policy 47, above.
CHAPTER 2. CIRCULATION ELEMENT	
Objective 1. To make certain that transportation facilities needed to support development are available. To ensure that these facilities occur in a timely manner so as to avoid traffic degradation.	CONSISTENT. As described in Section 4.17, *Transportation and Traffic,* construction and operation of the project would not disrupt normal traffic flows or otherwise conflict with the County's roadway performance policies and programs. Although the project would generate approximately 315 trips per day during construction, construction-related VMT is temporary and is not applicable to the transportation thresholds of significance recommended in the Governor's Office of Planning and Research's Technical Advisory, which are based on a measurement of the operational average VMT per capita. The project would generate up to 12 trips in the AM or PM during operation. Therefore, the project would not conflict with Circulation Element Objective 1.
Objective 5. Maintain a minimum Level Of Service (LOS) D for all roads throughout the County.	CONSISTENT. As described in Section 4.17, *Transportation and Traffic*, Although the project would generate approximately 315 trips per day during construction, construction-related VMT is temporary and is not applicable to the transportation thresholds of significance recommended in the governor's office of Planning and Research's Technical Advisory, which are based on a measurement of the operational average VMT per capita. The project would generate up to 12 trips in the AM or PM during operation. Therefore, the construction and operation phases of the project are not expected to cause any operational LOS impacts on the adjacent roadway facilities.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
2.3.3 HIGHWAY PLAN	
Goal 5. Maintain a minimum Level of Service (LOS) D.	CONSISTENT. As described in Section 4.17, *Transportation and Traffic* construction and operation of the project would not disrupt normal traffic flows or otherwise conflict with the County's roadway performance policies and programs. Although the project would generate approximately 315 trips per day during construction, construction-related VMT is temporary and is not applicable to the transportation thresholds of significance recommended in the Governor's Office of Planning and Research's Technical Advisory, which are based on a measurement of the operational average VMT per capita. The project would generate up to 12 trips in the AM or PM during operation. Therefore, the construction and operation phases of the project would not exceed a minimum LOS D, maintaining consistency with Goal 5.
Implementation Measure B. Continuity and integrity of the arterial and collector system at the mountain/valley region and the mountain/desert region boundary must be reviewed and approved in conjunction with project adoption on an individual basis.	CONSISTENT. The project boundary includes most of the San Joaquin Valley Floor portion of Kern County up to an elevation of 2,000 feet. The mountain/valley region and mountain/desert region interface area are outside the boundary of the project. Therefore, the project does not conflict with Circulation Element Implementation Measure B.
Implementation Measure C. Conformance to alignment minimum design standards, where roadways that deviate from section and mid-section lines intersect those lines, must be reviewed and approved in conjunction with project adoption on an individual basis.	CONSISTENT. As described in Section 4.17, *Transportation and Traffic*, no roadway improvements are required to serve the construction or operation of the project.
2.3.4 FUTURE GROWTH	
Policy 2. The County should monitor development applications as they relate to traffic estimates developed for this plan. Mitigation is required if development causes affected roadways to fall below Level of Service (LOS) D. Utilization of the CEQA process would help identify alternatives to or mitigation for such developments. Mitigation could involve amending the Land Use, Open Space and Conservation Element to establish jobs/housing balance if projected trips in any traffic zone exceed trips identified for this Circulation Element. Mitigation could involve exactions to build off-site transportation facilities. These enhancements would reduce traffic congestion to an acceptable level.	CONSISTENT. As discussed in Section 4.17, *Transportation and Traffic*, Construction and operation VMT would not affect traffic characteristics in this part of Kern County or elsewhere and would not cause affected roadways to fall below LOS D. Therefore, the project is consistent with Future Growth Policy 2.
Policy 4. As a condition of private development approval, developers shall build roads needed to access the existing road network. Developers shall build these roads	CONSISTENT. As described in Section 4.17, *Transportation and Traffic*, transportation requirements of the project during both construction and operation

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
to County standards unless improvements along State routes are necessary then roads shall be built to Caltrans standards. Developers shall locate these roads (width to be determined by the Circulation Plan) along centerlines shown on the circulation diagram map unless otherwise authorized by an approved Specific Plan Line. Developers may build local roads along lines other than those on the circulation diagram map. Developers would negotiate necessary easements to allow this.	would not affect traffic characteristics in this part of Kern County or elsewhere. Regional access to the project site can be obtained via the numerous highways and local roadways that traverse the North and South Belridge oilfields as shown on Chapter 3, *Project Description*, Figure 3-1. The project would not necessitate the development of additional roadway systems for project development and is, therefore, consistent with Future Growth Policy 4.
Implementation Measure C. project development shall comply with the requirements of the Kern County Zoning Ordinance, Land Division Ordinance, and Development Standards.	CONSISTENT. With the approval of a CUP, the project would comply with the County zoning ordinance. No variances or deviations are requested as part of the project. The project would conform to all applicable development standards.
2.5 OTHER MODES	
2.5.4 TRANSPORTATION OF HAZARDOUS MATERIALS	
Goal 1. Reduce risk to public health from transportation of hazardous materials.	CONSISTENT. Hazardous Materials Transportation and existing regulatory requirements of the California Vehicle Code that pertain to transport of hazardous materials and wastes are discussed in Section 4.9, *Hazards and Hazardous Materials*, of this EIR.
Policy 1. The commercial transportation of hazardous material, identification and designation of appropriate shipping routes will be in conformance with the adopted Kern County and Incorporated Cities Hazardous Waste Management Plan.	CONSISTENT. See 2.5.4, Transportation of Hazardous Materials, Goal 1, above.
Policy 2. Kern County and affected cities should reduce use of County-maintained roads and city-maintained streets for transportation of hazardous materials.	CONSISTENT. See 2.5.4, Transportation of Hazardous Materials, Goal 1, above.
Implementation Measure A. Roads and highways utilized for commercial shipping of hazardous waste destined for disposal will be designated as such pursuant to Vehicle Code Sections 31303 et seq. Permit applications shall identify commercial shipping routes they propose to utilize for particular waste streams.	CONSISTENT. See 2.5.4, Transportation of Hazardous Materials, Goal 1, above.
CHAPTER 3. NOISE ELEMENT	
3.2 NOISE SENSITIVE AREAS	
Goal 1. Ensure that residents of Kern County are protected from excessive noise and that moderate levels of noise are maintained.	CONSISTENT. Noise impacts, sensitive receptors, and County noise thresholds are evaluated in Section 4.13, *Noise*, of this EIR. As discussed in that section, the project would not cause significant impacts on sensitive receptors. Thus, the project would be consistent with this goal.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
Goal 2. Protect the economic base of Kern County by preventing the encroachment of incompatible land uses near known noise producing roadways, industries, railroads, airports, oil and gas extraction, and other sources.	CONSISTENT. The land uses proposed by the project are evaluated in Section 4.13, *Noise*, of this EIR. As discussed in this section, the project would be consistent with existing land use designations of the project site.
Policy 1. Review discretionary industrial, commercial, or other noise-generating land use projects for compatibility with nearby noise-sensitive land uses.	CONSISTENT. See 3.3, Sensitive Noise Areas, Goal 1, above.
Policy 2. Require noise level criteria applied to all categories of land uses to be consistent with the recommendations of the California Division of Occupational Safety and Health (DOSH).	CONSISTENT. See 3.3, Sensitive Noise Areas, Goal 1, above.
Policy 3. Encourage vegetation and landscaping along roadways and adjacent to other noise sources to increase absorption of noise.	CONSISTENT. See 3.3, Sensitive Noise Areas, Goal 1, above. Consistent with this policy the project would be encouraged to provide vegetation and landscaping along roadways and adjacent to other noise sources to increase the absorption of noise. However, as noted in Section 4.13, *Noise*, of this EIR, noise levels above 65 dBA exterior (L_{dn}) were only identified from the extract drill rigs used for drilling activities. However, although there are not many sensitive receptors close to the project area, there is still the potential for future single-family dwelling units to occur near the project area by right per the zoning allowances. To ensure no future sensitive receptors would be impacted by the proposed project, MM 4.13-1 would be implemented requiring the project proponent to provide substantial noise information prior to obtaining any grading or construction permit. Noise levels above 65 dBA exterior (L_{dn}) were not identified from any other stationary source on the project site. Therefore, the project is consistent with Safety and Health Policy 3.
Policy 4. Utilize good land use planning principles to reduce conflicts related to noise emissions.	CONSISTENT. See 3.3, Sensitive Noise Areas, Goal 2, above. Noise-sensitive land uses are evaluated in Section 4.13, *Noise*, of this EIR.
Policy 7. Employ the best available methods of noise control.	CONSISTENT. See 3.3, Sensitive Noise Areas, Goal 1, above.
Implementation Measure A. Utilize zoning regulations to assist in achieving noise-compatible land use patterns.	CONSISTENT. The land uses proposed by the project are evaluated in Section 4.13, *Noise*, of this EIR. As discussed in this section, the project would be consistent with the land use and zoning designations of the project site.
Implementation Measure J. Develop implementation procedures to ensure that requirements imposed pursuant to the findings of an acoustical analysis are conducted as part of the project permitting process.	CONSISTENT. As discussed in Section 4.13, *Noise*, of this EIR, construction and operational noise levels would not generate a substantial increase in ambient noise levels. However, although there are no sensitive receptors close to the project area, there is still the potential for future single-family dwelling units to occur near the

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
	project area by right per the zoning allowances. To ensure no future sensitive receptors would be impacted by the proposed project, MM 4.13-1 would be implemented requiring the project proponent to provide substantial noise information prior to obtaining any grading or construction permit. Therefore, the project is consistent with Safety and Health Implementation Measure J.
CHAPTER 4. SAFETY ELEMENT	
Goal 1. Minimize injuries and loss of life and reduce property damage.	CONSISTENT. Consistent with this goal, the project would be required to comply with adopted safety regulations, such as the County Fire Code, and related policies in the General Plan.
4.2 GENERAL POLICIES AND IMPLEMENTATION MEASURE, WHICH APPLY TO MORE THAN ONE SAFETY CONSTRAINT	
Policy 1. That the County's program of identification, mapping, and evaluating the geologic, fire, flood safety hazard areas, and significant concentrations of hydrogen sulfide in oilfield areas, presently under way by various County departments, be continued.	CONSISTENT. The project does not interfere with County-wide programs related to identification, mapping, and evaluation of geologic, fire, flood safety hazard areas, and hydrogen sulfide concentrations in oilfield areas. The programs would continue regardless of the approval of the project.
Implementation Measure A. All hazards (geologic, fire, and flood) should be considered whenever a Planning Commission or Board of Supervisor's action could involve the establishment of land use activity susceptible to such hazards.	CONSISTENT. Section 4.7, *Geology and Soils*, of this EIR, discusses potential geologic hazards, Section 4.10, *Hydrology and Water Quality*, of this EIR, discusses potential flood hazards, and Section 4.20, *Wildfire*, of this EIR discusses potential fire hazards as a result of project implementation. Consistent with this measure, all hazards have been considered as part of this analysis.
Implementation Measure F. The adopted multi-jurisdictional Kern County, California Multi- Hazard Mitigation Plan, as approved by FEMA, shall be used as a source document for preparation of environmental documents pursuant to CEQA, evaluation of project proposals, formulation of potential mitigation, and identification of specific actions that could, if implemented, mitigate impacts from future disasters and other threats to public safety.	CONSISTENT. As discussed in Section 4.9, *Hazards and Hazardous Materials*, of this EIR, the Kern Multi-Jurisdictional Hazard Mitigation Plan has characterized the agricultural floor of the San Juaquin Valley as an area of very high fire severity risk. Although the project site is not located within a high fire hazard severity zone, construction and operational activities could increase the potential for wildland fires. Therefore, wildfire impacts would be potentially significant and require the implementation of measures requiring the project proponent to comply with Kern County Fire Codes and limit use of fire-sensitive electrical equipment.
4.3 SEISMICALLY INDUCED SURFACE RUPTURE, GROUND SHAKING, AND GROUND FAILURE	
Implementation Measure B. Require geological and soils engineering investigations in identified significant geologic hazard areas in accordance with the Kern County Code of Building Regulations.	CONSISTENT. See 1.3, Physical and Environmental Constraints, Measure D, of the KCGP, above.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
Implementation Measure C. The fault zones designated in Kern County Seismic Hazard Atlas should be considered significant geologic hazard areas. Proper precautions should be instituted to reduce seismic hazard, whenever possible in accordance with State and County regulations.	CONSISTENT. See 1.3, Physical and Environmental Constraints, Goal 1, of the KCGP, above. Consistent with this policy, the project would not include development for human occupancy, and would not be located near an active earthquake fault.
4.5 LANDSLIDES, SUBSIDENCE, SEICHE, AND LIQUEFACTION	
Policy 1. Determine the liquefaction potential at sites in areas of shallow groundwater (Map Code 2.3) prior to discretionary development and determine specific mitigation to be incorporated into the foundation design, as necessary, to prevent or reduce damage from liquefaction in an earthquake.	CONSISTENT. Liquefaction potential is discussed in Section 4.7, *Geology and Soils*, of this EIR. The project would implement MM 4.7-1, which would require the project to submit an engineering design-specific geotechnical study to the Kern County Public Works Department to obtain the required grading permits. MM 4.7-1 would address potential soil stability impacts and prescribe specific design requirements to address these potential impacts related to unstable soils that could lead to liquefaction. Therefore, with the implementation of this mitigation measure, the project would be consistent with this goal to avoid impacts related to seismically induced liquefaction.
Policy 3. Reduce potential for exposure of residential, commercial, and industrial development to hazards of landslide, land subsidence, liquefaction, and erosion.	CONSISTENT. As discussed in Section 4.7, *Geology and Soils*, of this EIR, conditions for landslides are also not present at the site which is characterized by relatively gradual inclines across the site. Grading would be subject to compliance with the NPDES General Construction Permit requirements and site-specific measures would be incorporated into the SWPPP as required by MM 4.10-1 as discussed in Section 4.10, *Hydrology and Water Quality*, of this EIR. The implementation of required BMPs would have the ability to minimize the potential for erosion or loss of topsoil. Implementation of MM 4.7-1, which includes adherence to the requirements of applicable building codes and earthquake-safe design standards), would ensure that effects from seismic-related ground failure including liquefaction would be minimized. In addition, with regard to erosion, as discussed in Section 4.10, *Hydrology and Water Quality*, of this EIR, the project would implement MM 4.10-2, which requires the completion of a hydrologic study and final drainage plan for the project prior to the issuance of a grading permit. This would serve to reduce any impacts related to erosion, consistent with this policy.
4.6 WILDLAND AND URBAN FIRE	
Policy 1. Require discretionary projects to assess impacts on emergency services and facilities.	CONSISTENT. Consistent with this policy, impacts on emergency services and facilities are discussed and evaluated in Section 4.9, *Hazards and Hazardous*

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
	Materials, of this EIR. The project would implement MM 4.9-19, which would require preparation and implementation of a fire safety plan to ensure the provision of appropriate access. Additionally, per Section 4.15, *Public Services*, of this EIR, the project would also implement MM 4.15-4 to ensure that the cost of emergency preparation in the event of CO_2 release is fully funded and MM 4.15-5 to ensure that all requirements, including payments, have been met prior to final closure of the facility.
Policy 3. The County will encourage the promotion of fire prevention methods to reduce service protection costs and costs to taxpayers.	CONSISTENT. The project would not interfere with or prohibit the County's ability to meet this policy. MM 4.9-19 requires the proponent to develop a fire safety plan for use during construction and operational activities. All on-site employees would be trained on fire safety and how to respond to on-site fires, should they occur. See Sections 4.9, *Hazards and Hazardous Materials*, 4.15, *Public Services*, and 4.20, *Wildfire*, of this EIR.
Policy 4. Ensure that new development of properties have sufficient access for emergency vehicles and for the evacuation of residents.	CONSISTENT. Consistent with this policy, Section 4.17, *Transportation*, of this EIR includes MM 4.17-1, which would require the approval of a Construction Traffic Control Plan, encroachments, and or other necessary permits by Caltrans and/or the Kern County Roads Department. The project proponent would also develop and implement a fire safety plan for use during construction and operation.
Policy 6. All discretionary projects shall comply with the adopted Fire Code and the requirements of the Fire Department.	CONSISTENT. Consistent with this policy, Section 4.9, *Hazards and Hazardous Materials*, of this EIR includes MM 4.9-19, which requires the proponent to develop a fire safety plan for use during construction and operational activities. The project would be required to comply with the adopted Fire Code and the requirements of the Kern County Fire Department.
Implementation Measure A. Require that all development comply with the requirements of the Kern County Fire Department or other appropriate agency regarding access, fire flows, and fire protection facilities.	CONSISTENT. Consistent with this measure, the proposed project would implement MM 4.9-19, which would require the preparation and implementation of a fire safety plan to ensure the provision of appropriate access. The project would implement MM 4.15-4 to ensure that the cost of emergency preparation in the event of CO_2 release is fully funded and MM 4.15-5 to ensure that all requirements, including payments, have been met prior to final closure of the facility.

Table 4.11-4: Project Consistency with Local Planning Documents

Goals and Policies	Project Consistency
4.9 HAZARDOUS MATERIALS	
Implementation Measure A. Facilities used to manufacture, store, and use of hazardous materials shall comply with the Uniform Fire Code, with requirements for siting or design to prevent on-site hazards from affecting surrounding communities in the event of inundation.	CONSISTENT. See 4.6, Wildland and Urban Fire, Policy 6, above.
5.3.2 KERN COUNTY'S ECONOMIC DEPENDENCE ON THE OIL MARKETPLACE	
Policy 3. The County shall encourage the conversion of existing petroleum-related facilities to other productive uses when they are no longer needed or productive.	CONSISTENT. The project does include the conversion of oil and gas facilities.
Policy 4. The County should encourage the development of renewable energy industries to diversify the energy economy in Kern County.	CONSISTENT. MM 4.11-1 allows conditional use of the surface for commercial-scale solar, thereby encouraging renewable energy.

Key:
BMP = best management practice
CCS = carbon capture and storage
CDFW = California Department of Fish and Wildlife
CEQA = California Environmental Quality Act
CIC = Cumulative Impact Charge
CO_2 = carbon dioxide
CUP = Conditional Use Permit
dBA = A-weighted decibels
DOC = California Department of Conservation
EIR = Environmental Impact Report
EOR = enhanced oil recovery
KCGP = Kern County General Plan
L_{dn} = average day/night sound
LOS = level of service
MM = Mitigation Measure
MRZ = Mineral Resource Zone
NOP = Notice of Preparation
NPDES = National Pollutant Discharge Elimination System
SWPPP = Storm Water Pollution Prevention Plan
USFWS = U.S. Fish and Wildlife Service
VMT = vehicle miles traveled

The processing and consideration of a CUP and zoning for consistency provide for a review and evaluation of the compatibility of the underground storage project with surrounding communities. The project activities occur in localized areas. However, there is a much larger area of surface land over the top of the CO_2 storage with no activities related to the storage.

The pore space is owned by the surface owner and not the mineral owner. Two of the parcels – 068-200-41 (66.84 acres) and 068-220-39 (26.17 acres) are not owned by the applicant and authorization from these owners to be included in this CCS project is required or the applicant must have full ownership of these parcels. As the pore space storage area is based on an underground area that cannot be artificially changed, these parcels must be included in the project for the CCS storage to be effective. MM 4.11-6 mandates that these parcels must be included in the project.

This presents conformity issues for the CUP. Kern County does not permit multiple site plans or CUPs for activities on the exact same piece of property. Such a policy would confuse the public and could result in possible legal conflicts between investors and owners. All contemplated activities must be included in the CUP project description even if they require further environmental review before approval. In addition, while the injection of CO_2 under a building or facility 3,000 feet deep or more may be safe based on science modeling, policy determinations at this time will be conservative and not support that type of land use. Identified uses that can be proposed on the CCS surface land area inside the CUP boundary are limited to commercial-scale solar and energy storage for electricity (MM 4.11-1), agricultural cultivation only (MM 4.2-1), and existing oil and gas operations but not EOR. EOR in association with the collection of CO_2 with this project is prohibited by state law. Each of these uses are described and restricted by each specific mitigation to ensure the operator understands the limitations on the surface site and complies with all applicable requirements of the EIR. Of specific concern is any activity that would drill wells or other shafts that could penetrate the capstone of the carbon capture area or disturb the wildlife protective buffer around the injection wells. Commercial scale or accessory solar and energy storage for electricity requires modification of the CUP and additional review under CEQA before any decision for approval or denial.

MM 4.11-3 requires the Kern County Planning and Natural Resources Department to put a notification on every Assessor Parcel within the CUP boundary in the Kern County Building Department Permitting Portal (Accela) so that appropriate review for restrictions of any permit can be done before issuance. MM 4.11-4 and MM 4.11-6 provide procedures for making the boundary of the CCS surface area larger or smaller after approval. MM 4.11-5 incorporates requirements from Senate Bill (SB) 905 for notification of adjacent property owners and communities that injection will begin, as well as deed and injection schedule notification restrictions.

MM 4.11-1 through MM 4.11-6 would provide additional protections and notification for compatibility with surrounding areas. With these measures, as well as those in Section 4.15, *Public Services*, the impacts on Land Use and Planning are less than significant.

Chapter 3, *Project Description*, Section 3.4.1, *Future Sources Identification*, provides the assumptions used for analysis of the source of CO_2 for the project. As discussed, only one source is currently identified and covered by this EIR: pre-combustion (Pre-C) produced gas stream and

post-combustion (Post-C) flue gas from within the Belridge oilfields. All future sources for CO_2 for injection will be limited by geographic location, specific types of industries, and environmental review before they can be approved to be injected into the project.

MM 4.11-7 limits future project sources to the following parameters:

- Location only within Kern County
- Hydrogen – green and blue
- Biomass carbon removal and storage
- Cement production
- Green steel production
- Oilfield field gas streams
- Power plants
- Direct air capture
- Alternative fuel production
- Industrial use is approved in an appropriately zoned parcel with CO_2 capture and transport requiring an additional CUP and EIR for compliance with CEQA for unincorporated Kern County.
- All CO_2 pipelines require a CUP and EIR for compliance with CEQA.
- CO_2 from a source in an incorporated city in Kern County must show compliance with the preparation of an environmental document, with Kern County as a responsible agency and not an exemption from CEQA review.
- Prior to injection of any approved CO_2, compliance with all applicable State and federal EPA permit conditions must be met.

MM 4.11-1 through MM 4.11-7 will provide additional protections, notification for surrounding property owners, and a full review of all future sources for compliance with the Zoning Ordinance, KCGP, and CEQA. With these measures, as well as those in Section 4.15, *Public Services*, the impacts on Land Use and Planning are less than significant.

Mitigation Measures

MM 4.11 -1 Any proposed use of any portion of the carbon capture and storage (CCS) Surface Land Area for solar or energy storage for electricity for any use on site or off site will require a Conditional Use Permit (CUP) and evaluation of the project under the California Environmental Quality Act (CEQA). Any application submitted to the Kern County Planning and Natural Resources Department for any type of solar or energy storage shall include a written acknowledgement that the solar or energy storage owner/operator is aware that if approved, the CUP will have site specific restrictions and conditions for operation related to the location as part of the CCS Surface Land Area. Any such project

would include, but not be limited to, the following mitigation measures:

a. No activities are being authorized for use of the area that would involve drilling of any water wells or other exploratory activities that would penetrate the confined cap layer as restricted by the approved CCS CUP.

b. No use of the buffer area around the injection well sites is included in any construction activity.

c. Written acknowledgement that solar owner, contractor and/or operator has been informed and has a binding agreement to not conduct any activities near or in proximity to either the injection well sites or the capture facilities that would damage the fencing or equipment.

d. The solar or energy storage project shall include a Worker Awareness Program for all contractors and employees of the use that the project is within the area for the underground storage of CO_2.

e. That the project is bound by all applicable requirements of the Aera CarbonFrontier CCS Project and EIR Mitigation Monitoring and Reporting Plan.

MM 4.11-2 Use of the CCS Surface Land Area is restricted to Agricultural Cultivation (MM 4.10-1), Solar and Energy Storage (MM 4.10-1), and oil and gas exploration and production with appropriate permits. All other uses are prohibited.

MM 4.11-3 The Kern County Building Department Permitting Portal (Accela) shall have a notation in each individual Assessor Parcel Numbers (APN) that is included in the CCS Surface Land Area of the following:

> **"***This Parcel is included in the approved Carbon Capture and Storage Conditional Use Permit (*CarbonFrontier Project [Kern County] by Aera Energy LLC). *Uses are specifically limited to only the approved Carbon Capture and Storage project, agricultural cultivation, conservation and permitted oilfield activities. No building permits can be issued without specific review and approval from the Kern County Planning and Natural Resources Department for any use."*

MM 4.11-4 No Lot Line Adjustment may be made that adds land to any parcels included in the CCS Surface Land Area without a formal modification of the CUP at a hearing and review under CEQA. Any recorded Lot Line Adjustment to reduce the size of the CCS Surface Land Area to conform to the Approved Area of Review or reduce the parcel used for monitoring or seismic wells may be done administratively by submitting a CUP site plan map with the reduced CCS Surface Land Area shown and notation of the new parcels that are included in the CUP boundary but will be outside the CCS Surface Land Area.

MM 4.11-5 Prior to any grading or building or construction, a deed restriction notification document

shall be recorded by the applicant with language as approved by the Kern County Planning and Natural Resources Department that gives constructive notice that the CCS Surface Land Area, described by both APNs and legal description, is an approved CCS project subject to a CUP and related Environmental Impact Report (EIR). The document shall be recordable and provide information for access to the following information that shall be updated quarterly, or as applicable:

a. Names of operator of CCS facility and physical address of headquarters and email, dates of injection, quantity of injections, and specific injection zone or zones.

b. Sixty (60) days before commencing the first injection of CO_2, the applicant shall provide written notice to all owners (surface and mineral) within the CUP boundary and all adjacent property owners (surface and mineral) by certified mail. The notice shall be reviewed and approved, before mailing by the applicant, by the Kern County Planning and Natural Resources Department.

MM 4.11-6 The following APNS are provisionally included in the Aera CarbonFrontier CCS Project Draft EIR for analysis based on pore space characteristics:

a. APN 068-200-41 Section 22/T27S/R 20E (66.84 acres)

b. APN 068-220-39 Section 36/T27S/R20E (26.17 acres)

1. Written authorization from the legal property owners for both pore space and surface land to be included in the Aera CarbonFrontier CCS Project CUPs must be provided to the Kern County Planning and Natural Resources Department. With written concurrence from the EPA the parcels may be excluded from the project and no authorization is required.

2. If the EPA reports, based on the monitoring evidence, that the approved Area of Review for the underground CCS storage has expanded outside the boundaries of the CCS Surface Land Area, a formal modification of the CUP boundary shall be made at a noticed public hearing at the Kern County Board of Supervisors and all applicable mitigation measures implemented.

MM 4.11-7 All CO2 injected into CarbonFrontier Project must comply with the following criteria. Written evidence of such compliance shall be submitted to the Kern County Planning and Natural Resources Department for review and approval.

a. Source of CO_2 must be from an industry within Kern County.

b. Only the following industries may send captured CO_2 for injection to the Aera CarbonFrontier CCS Project.

1. Hydrogen – Green
2. Hydrogen – Blue
3. Biomass Carbon Removal and Storage
4. Cement production
5. Green Steel production
6. Oilfield field gas streams
7. Power Plants
8. Direct Air Capture
9. Alternative Fuel production

b. The source of the captured CO_2 must comply with the following conditions:

1. Projects within unincorporated Kern County: the listed use is approved in an appropriately zoned parcel with CO_2 capture and transport requiring an additional CUP and EIR for compliance with CEQA.

2. Projects within an incorporated City in Kern County: the listed use has capture technology for CO_2 that shows compliance with the preparation of an environmental document, with Kern County as a Responsible Agency and not the use of an exemption from CEQA review.

3. All CO_2 pipelines for transport from offsite sources that traverse unincorporated Kern County land require a CUP and EIR for compliance with CEQA. Any CO_2 pipelines that are permitted by the California Public Utilities Commission (CPUC) for a common carrier company that requests to connect to the Aera CarbonFrontier CCS Project for injection are not covered by this EIR and either (a) must comply with a CUP and EIR by Kern County before injection can commence into the Aera CarbonFrontier CCS Project, or (b) Kern County has participated in the CPUC process and reasonable and feasible mitigation for protection of Kern County communities has been included.

4. The injected CO_2 from an approved source is in full compliance with all requirements of State law and the federal EPA permit.

Level of Significance After Mitigation

Impacts would be less than significant.

4.11.5 Cumulative Setting, Impacts, and Mitigation Measures

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present, and reasonably foreseeable future oil and gas development, including wells and abandonment activity to implement CCS projects, constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities and operation of the wells, and abandonment activities as projected in the Oil and Gas EIR.

The documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells per year countywide of various types (production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021), and an additional 5,066 other wells (cyclic wells, SB 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for eight years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. California Geologic Energy Management Division permitting for all wells, except for plugging and abandonments, has never averaged over 2,000 permits a year (as implementation in some years of the Kern County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts on land use and planning resources is considered the western section of Kern County near the floor of the San Joaquin Valley. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and KCGP amendments discussed in Section 3.9, *Cumulative Projects*, would have on land use and planning

resources. This geographic scope of analysis is appropriate because the land use and planning resources within this area are expected to be similar to those in the project site because of their proximity.

Impact 4.11-3: Contribute to Cumulative Land Use and Planning Resource Impacts

With regard to impacts on land use and planning resources, the project does not have the potential to contribute significantly to cumulative impacts within the County. A complete analysis of the cumulative impacts on land use and planning resources from oil and gas operations is provided in Section 4.10, *Land Use and Planning* of the Oil and Gas EIR. With regard to the cumulative effects of the project, together with other projects resulting in a physical divide of an established community (Impact 4.10-1 of *Land Use and Planning* of the Oil and Gas EIR), the project's impact would be minimal because there are no established residential communities in the project area. The project's contribution to any cumulative land use and planning impact would not be cumulatively considerable. With regard to Impact 4.11-2, and 4.11-3, MM 4.11-1 through MM 4.11-6 as well as MM 4.15-1 though MM 4.15-2 (see Section 4.15, *Public Services*) provide compatibility with plans and policies of Kern County and surrounding communities. The cumulative impacts are, therefore, less than significant.

Mitigation Measures

Implement MM 4.11-1 through MM 4.11-6, as described above, and MM 4.15-1 and MM 4.15-2, as described in Section 4.15, *Public Services*.

Level of Significance after Mitigation

Cumulative impacts would be less than significant.

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Section 4.12

Mineral Resources

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Section 4.12
Mineral Resources

4.12.1 Introduction

This section of the Environmental Impact Report (EIR) describes the affected environment and regulatory setting for mineral resources. It also describes the impacts on mineral resources that would result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers) southwest of the community of Lost Hills and west of State Route (SR) 33.

A description of the environmental setting (affected environment) for mineral resources is presented in Section 4.12.2, *Environmental Setting*. The regulatory setting applicable to mineral resources is presented in Section 4.12.3, *Regulatory Setting*, and Section 4.12.4, *Impacts and Mitigation Measures*, discusses project impacts and associated mitigation measures.

Mineral Resources Terminology

State law defines "minerals" as "[a]ny naturally occurring chemical element or compound, or groups of elements and compounds, formed from inorganic processes and organic substances, including coal, peat, and bituminous rock, but excluding geothermal resources, natural gas, and petroleum" (14 California Code of Regulations [CCR] § 3501). For this EIR, "minerals" are defined as also including oil and gas resources. Information used to prepare this section was sourced from the California Geological Survey and Kern County General Plan (KCGP).

4.12.2 Environmental Setting

Regional Setting

Kern County is California's third largest county, encompassing 8,202 square miles at the southern end of the Central Valley. The 12,362-acre project area is predominantly located in the Central Valley portion of the County in the San Joaquin Valley bounded by Kings and Tulare Counties to the north, Santa Barbara and San Luis Obispo Counties to the west, the Tehachapi Mountains and the Sierra Nevada range to the east, and the northern boundary of the Los Padres National Forest to the south.

Kern County is located within the Inland District of the Department of Conservation's California Geologic Energy Management Division (CalGEM) and is one of the richest oil-producing counties in the United States. The valley floor area of the County and the lower elevations of the surrounding mountain ranges contain numerous deposits of oil and gas resources, a major economic resource for the county.

Other mineral resources in Kern County include numerous mining operations that extract a variety of materials, including petroleum, natural gas, aggregate materials (sand and gravel), stone, gold, dimensional stone, limestone, clay, shale, gypsum, pumice, decorative rock, silica, and specialty sand.

Oil and Gas Resources

Kern County leads the state in oil and natural gas production. Kern County produced 71 percent of California's in-state oil in 2019 and about 78 percent of the state's total natural gas (KDEF 2021). Kern County's Elk Hills is the state's top natural gas producer. Kern County produced 119 million barrels of oil and 129 billion cubic feet of natural gas in 2019 (KDEF 2021).

Mineral and petroleum resources are a fundamental element of Kern County's employment base and overall economy. As new recovery technologies come into use, petroleum extraction should continue its economic importance. Even as California ramps up state laws to promote renewable energy resources and alternative transportation fuels, experts continue to recognize that oil and gas production will continue to be critical, and domestic oil and gas production remains a vital national interest.

Mineral Resource Zones

The Surface Mining and Reclamation Act of 1975 (SMARA) requires the State Geologist to classify land into Mineral Resource Zones (MRZs) according to its known or inferred mineral potential. The State Geologist has classified 2,971 square miles of land in Kern County as MRZs of varying significance. The designated MRZs in the project area are for aggregate resources, consisting of stone, sand, and gravel, generally suitable for use in building and road construction (CGS 2009), and are defined as follows:

- **MRZ-1**: Areas where available geologic information indicates that little likelihood exists for the presence of significant mineral resources.
- **MRZ-2**: Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood for their presence exists. This zone shall be applied to known mineral deposits or where well-developed lines of reasoning based upon economic-geologic principles and adequate data demonstrate that the likelihood for the occurrence of significant mineral deposits is high.
  - **MRZ-2a**: Areas underlain by mineral deposits where geologic data indicate that significant measured or indicated resources are present. Areas classified as MRZ-2a contain discovered mineral deposits that are either measured or indicated reserves. The land included in MRZ-2a is of prime importance because it contains known economic mineral deposits.
  - **MRZ-2b**: Areas underlain by mineral deposits where geologic information indicates that significant inferred resources are present. Areas classified MRZ-2b contain inferred mineral resources as determined by their lateral extension from

proven deposits or their similarity to proven deposits. Further exploration could result in upgrading areas classified as MRZ-2b to MRZ-2a.

- **MRZ-3:** Areas containing known or inferred mineral occurrences of undetermined mineral resource significance (CGS 2009).
  - **MRZ-3a**: Areas containing known mineral occurrences of undetermined economic significance. Further exploration could result in the reclassification of all or part of these areas into MRZ-2a or MRZ-2b categories.
  - **MRZ-3b**: Areas containing inferred mineral occurrences of undetermined economic significance. Further exploration could result in the reclassification of all or part of these areas into the MRZ-2a or MRZ-2b categories.
- **MRZ-4**: Areas containing no known mineral occurrence.

Local Setting

According to the Updated Mineral Land Classification Map for Portland Cement Concrete-Grade Aggregate in the Bakersfield Production-Consumption Region, Kern County, California (CGS 2009), the project area is designated as MRZ-3 and contains known or inferred mineral occurrences of undetermined mineral resource significance. No locally important mineral resource recovery sites are delineated in the KCGP; however, several parcels within the project area are designated as "mineral and petroleum" land use.

Aggregate Mines

According to a database search of active mines listed in the California Department of Conservation, Division of Mine Reclamation (DMR) database, there are no active or newly permitted (and presumed to be active in the near future) aggregate materials mines in the project area (DMR 2023). The nearest mapped mine is approximately 10 miles south of the site and is indicated to be an open pit with a primary product of shale gravel.

Other Mineral Resources

According to a search of the DMR database, there are no active mines in the project area producing either shale, diatomite, clay, or gypsum (DMR 2023).

4.12.3 Regulatory Setting

Federal

No federal laws, regulations, or policies are applicable to mineral resources in relation to the proposed project.

State

Surface Mining and Reclamation Act of 1975

SMARA was enacted to identify and protect mineral resources of statewide or regional significance and ensure that those resources are available when needed. SMARA requires the State Geologist to classify land into MRZs according to its known or inferred mineral potential. The primary goal of mineral land classification is to ensure that the mineral potential of the land is recognized by local government decision-makers and considered before land use decisions are made that could preclude mining.

Surface Mining and Reclamation Act of 1975 - State Mining and Geology Board

Pursuant to SMARA, mineral lands are mapped with the California Mineral Land Classification System according to jurisdictional boundaries. All mineral commodities in the area, including aggregates, common clay, and dimensional stone, are mapped at one time. Priority is given to areas where future mineral resource extraction could be precluded by incompatible land uses or mineral resources are likely to be mined during the 50-year period following their classification. Detailed mineral land classification and designation reports provided by the State Mining and Geology Board (SMGB) are on file with the City of Bakersfield and Kern County. The SMGB also has adopted regulations (14 CCR 3500 et seq.) establishing state policy for reclamation of mined lands and conducting surface mining operations.

The SMGB established MRZs to designate lands that contain mineral deposits. Accordingly, the MRZ classification system is used to evaluate an area's mineral resources pursuant to SMARA. A "resource" is a concentration of naturally occurring solid, liquid, or gaseous material in such form and amount that economic extraction of the commodity from the concentration is currently potentially feasible. A "reserve" is the part of the resource base that could be economically extracted or produced within the foreseeable future. For any given mineral resource, an area may be classified as MRZ-1, MRZ-2, MRZ-3, or MRZ-4, as noted previously.

As described in Section 4.12.2, *Environmental Setting*, the project area contains mineral resource areas classified as MRZ-3.

According to the SMGB, "Designation" is the process by which the SMGB determines that a particular classified mineral deposit is of regional, multi-community, or statewide economic significance. This process is facilitated through analyses by the State Geologist and the California Division of Mines and Geology (also known as the California Geological Survey [CGS]), and information gathered from local communities, the mining industry, and other governmental agencies, such as the Governor's Office of Planning and Research. The purpose of the designation is to identify those areas that are of prime importance in meeting the future needs of the study region and that remain available from a land use perspective.

Designation is an effort to conserve mineral resources in regions of expected rapid urbanization or other land uses that might prevent surface mining activities and, therefore, result in a loss of the mineral resource to the community. To avoid dictating to local communities where future

aggregate mines should be located, mineral-designated areas generally contain resources (un-permitted deposits) that are far in excess of the region's 50-year demand. This approach attempts to provide maximum flexibility to local governments in making land use decisions, while still conserving an adequate amount of construction aggregate for the future.

The objectives of these processes are to provide local agency decision-makers with information on the location, need, and importance of mineral resources within their jurisdiction, and to require that this information be considered in local land use planning decisions. These objectives are met through the adoption of local Mineral Resource Management Policies that provide for the conservation and prudent development of these mineral deposits.

California Department of Conservation Geologic Energy Management Division

CalGEM is a state agency responsible for supervising the drilling, operation, maintenance, plugging, and abandonment of oil, gas, and geothermal wells. CalGEM's regulatory program promotes the wise development of oil, natural gas, and geothermal resources in California through sound engineering practices, prevention of pollution, and implementation of public safety programs. To implement this regulatory program, CalGEM requires avoidance of building over or near plugged or abandoned oil and gas wells or requires the remediation of wells to current CalGEM standards. CalGEM oversees well operations and regulates the production of oil and gas, as well as geothermal resources, within the State of California, pursuant to CCR, Title 14, Division 2, Chapter 4, which includes well design and construction standards, surface production equipment and pipeline requirements, and well abandonment procedures and guidelines.

Local

Kern County General Plan

The project area is located within the KCGP area and, therefore, would be subject to applicable policies and measures of the KCGP. The Land Use, Conservation, and Open Space Element and the Energy Element of the KCGP include goals, policies, and implementation measures related to mineral resources that apply to the project, as described below.

No locally important mineral resource recovery sites, as delineated in the KCGP, are located within the project area; however, several parcels within the project area are designated as "mineral and petroleum" land use, by the KCGP (see Chapter 3, *Project Description*). The "mineral and petroleum" land use designation is applied to "areas which contain producing or potentially productive petroleum fields, natural gas, and geothermal resources, and mineral deposits of regional and Statewide significance…Uses are limited to activities directly associated with the resource extraction. Uses shall include, but are not limited to, the following: Mineral and petroleum exploration and extraction, including aggregate extraction; extensive and intensive agriculture; mineral and petroleum processing (excluding petroleum refining); natural gas and geothermal resources; pipelines; power transmission facilities; communication facilities; equipment storage yards; and borrow pits."

Chapter 1. Land Use, Conservation, and Open Space Element

1.9. Resource

Goals

Goal 1. To contain new development within an area large enough to meet generous protections of foreseeable need, but in locations that will not impair the economic strength derived from the petroleum, agriculture, rangeland, or mineral resources or diminish the other amenities that exist in the County.

Goal 2. Protect areas of important mineral, petroleum, and agricultural resource potential for future use.

Goal 3. Ensure the development of resource areas to minimize effects on neighboring resource lands.

Policies

Policy 1. Appropriate resource uses of all types will be encouraged as desirable and consistent interim uses in undeveloped portions of the County regardless of General Plan designation.

Policy 14. Emphasize conservation and development of identified mineral deposits.

Policy 17. Lands classified as MRZ-2, as designated by the State of California, should be protected from encroachment of incompatible land uses.

Implementation Measures

Implementation Measure H. Use the California Geological Survey's latest maps to locate mineral deposits until the regional and Statewide importance mineral deposits map has been completed, as required by the Surface Mining and Reclamation Act.

Implementation Measure I. Periodically review the Zoning Ordinance to reflect new technology and energy sources, and encourage these types of uses for new development.

Chapter 5. Energy Element

5.2. Importance of Energy to Kern County

General Goal

To assert Kern County's position as California's leading energy provider, to encourage safe and orderly energy development within the County, including research and demonstration projects, and to become actively involved in the decisions and actions of other agencies as they affect energy development in Kern County.

Policies

Policy 5. The County shall work with other agencies to define regulatory responsibility concerning energy-related issues, and shall seek to eliminate, insofar as possible, duplicative regulations.

4.12.4 Impacts and Mitigation Measures

This section describes the impact analysis relating to mineral resources for the proposed project. It describes the methods used to determine the impacts of the project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (that is, avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion, where applicable.

Methodology

Potential impacts of the project on mineral resources have been evaluated using a variety of sources, including a review of information from the California Department of Conservation, CGS, and Kern County publications and maps. Using the aforementioned resources and professional judgment, impacts were analyzed according to the California Environmental Quality Act (CEQA) significance criteria described in this subsection.

A list of the specific cited references is provided at the end of this resource section.

Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would have a significant impact on mineral resources if it would:

- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or
- Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

Project Impacts

Impact 4.12-1: Result in the Loss of Availability of a Known Mineral Resource that would be of Value to the Region and the Residents of the State

Project activities could result in the temporary or permanent loss of availability of mineral resources if project development prevents those resources from being extracted, or if project activities prevent access to mineral resources. As described above, the project site is located on lands designated as MRZ-3, where known or inferred mineral occurrences of undetermined mineral resource significance are present (CGS 2009). No mines were determined to be active within the project area.

Oil and gas in the Belridge oilfield reservoirs are considered a mineral resource of value to the state as identified in the KCGP. The state restriction on enhanced oil recovery in the carbon capture and storage (CCS) surface land area and area of review, as well as requirements to abandon over 200 wells, as regulated by the U.S. Environmental Protection Agency Underground Injection Control permit, would result in a significant loss of oil and gas resources. The project would restrict oil and gas exploration and extraction on over 12,000 acres in an established oilfield with known resources. Additionally, new technology might have the potential to find deeper reserves if the area of review was not limited by the implementation of the project. Therefore, the implementation of the proposed project would result in the loss of availability of known mineral resources of oil and gas, and the project would result in a significant and unavoidable impact. There are no feasible or reasonable measures that can legally be implemented to reduce the impacts on mineral resources.

Mitigation Measures

No feasible or reasonable mitigation measures.

Level of Significance

Impact would be significant and unavoidable.

Impact 4.12-2: Result in the Loss of Availability of a Locally Important Mineral Resource Recovery Site Delineated on a Local General Plan, Specific Plan, or Other Land Use Plan

The project would result in the loss of oil and gas resources that could reasonably be expected to be recovered as discussed above under Impact 4.11-1, the loss of the existing oil reservoir due to the state restriction on enhanced oil recovery in the CCS surface land area and area of review is a significant loss of oil and gas. This oil and gas resource is considered a mineral of value to the state and a locally important resource to the Kern County economy, as identified in the KCGP. Therefore, implementation of the proposed project would result in the significant loss of availability of a locally important mineral resource, and the project would result in a significant and unavoidable impact.

Mitigation Measures

No feasible or reasonable mitigation measures.

Level of Significance

Impacts would be significant and unavoidable.

4.12.5 Cumulative Setting, Impacts, and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present, and reasonably foreseeable future oil and gas development including wells and abandonment activity to implement carbon capture and storage projects constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The Oil and Gas EIR (including its supplemental documents) is subject to a pending court challenge. The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that are not disputed in the current litigation. The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells per year countywide of various types (production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 other wells (cyclic wells, Senate Bill [SB] 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for 8 years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. CalGEM permitting for all wells with the exception of plugging and abandonments has never averaged over 2,000 permits a year (as implementation in some years of the Kern County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts on mineral resources comprises the area of all CCS projects within the County. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects*, would have on mineral resources. This geographic scope of analysis is appropriate because mineral resources impacts within CCS project areas are expected to be similar in that each would result in a loss of oil extraction opportunities throughout the County.

Impact 4.12-3: Contribute to Cumulative Mineral Resources Impacts

With regard to impacts on mineral resources, the project has the potential to contribute significantly to cumulative impacts on mineral resources within the region. A complete analysis of the cumulative impacts on mineral resources from oil and gas activities is provided in Section 4.11, *Mineral Resources*, of the Kern County Oil and Gas EIR.

The project could result in the loss of availability of locally important mineral resources if activities prevented access to those resources. As previously discussed, the project is expected to result in a significant and unavoidable loss of oil and gas resources, which is considered a mineral of value to the State and County as identified in the KCGP. There are no feasible or reasonable measures that can legally be implemented to reduce the impacts on mineral resources.

The proposed project, in conjunction with other related projects, may result in the loss of availability of a known mineral resource or a locally important mineral resource recovery site and may contribute to cumulative impacts on mineral resources with all feasible and reasonable mitigation.

Mitigation Measures

No feasible or reasonable mitigation measures.

Level of Significance

Cumulative impacts would be significant and unavoidable.

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Section 4.13

Noise

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Section 4.13
Noise

4.13.1 Introduction

This section of the Environmental Impact Report (EIR) describes the affected environment and regulatory setting regarding noise. It also evaluates existing noise conditions in the project area and analyzes the impacts on ambient noise and vibration levels that would result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers) southwest of the community of Lost Hills and west of State Route (SR) 33.

The section is informed by technical documents by Stantec Consulting Services Inc. for the project — specifically, the Noise Study (Stantec 2023, Appendix H) and the Traffic Impact Study (Stantec 2023, Appendix I).

A description of the environmental setting (affected environment) for noise is presented in Section 4.13.2, *Environmental Setting*. The regulatory setting applicable to noise-related impacts is presented in Section 4.13.3, *Regulatory Setting*, and Section 4.13.4, *Impacts and Mitigation Measures,* discusses project impacts and associated mitigation measures.

Noise Terminology

Ambient Noise: the composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Community Noise Equivalent Level (CNEL): The average equivalent sound level during a 24-hour day, obtained after addition of approximately 5 decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and 10 decibels to sound levels in the night before 7:00 a.m. and after 10:00 p.m.

Decibel (dB): A unit for describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).

Day-Night Average Sound Level (DNL/L_{dn}). The average equivalent sound level during a 24-hour day, obtained after the addition of 10 decibels to sound levels in the night after 10:00 p.m. and before 7:00 a.m.

Equivalent Sound Level (L_{eq}): The sound level containing the same total energy as a time-varying signal over a given sample period. L_{eq} is typically computed over 1-, 8-, and 24-hour sample periods.

NOTE: The CNEL and DNL represent daily levels of noise exposure averaged on an annual basis, while L_{eq} represents the average noise exposure for a shorter time period, typically 1 hour.

L_{max}: The maximum noise level recorded during a noise event.

L_n: The sound level exceeded "n" percent of the time during a sample interval (for example, L90, L50, and L10). For example, L10 equals the level exceeded 10 percent of the time.

Noise Exposure Contours: Lines drawn about a noise source indicating constant levels of noise exposure. CNEL and DNL contours are frequently utilized to describe community exposure to noise.

Noise Level Reduction: The noise reduction between indoor and outdoor environments or between two rooms that is the numerical difference, in decibels, of the average sound pressure levels in those areas or rooms. A measurement of a noise level reduction combines the effect of the transmission loss performance of the structure plus the effect of acoustic absorption present in the receiving room.

Sound Exposure Level or Single Event Noise Exposure Level: The level of noise accumulated during a single noise event, such as an aircraft overflight, with reference to a duration of one second. More specifically, it is the time-integrated A-weighted squared sound pressure for a stated time interval or event, based on a reference pressure of 20 micropascals and a reference duration of 1 second.

Sound Level: The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high-frequency components of the sound in a manner similar to the response of the human ear and gives a good correlation with subjective reactions to noise.

Sound Transmission Class: The single-number rating of sound transmission loss for a construction element (for example, windows and doors.) over a frequency range where speech intelligibility largely occurs.

The assessment of noise impacts uses specific terminology and fundamental descriptors not commonly used in everyday conversation. Therefore, to assist in a thorough understanding of the subsequent analysis, these terms are discussed in this subsection. Acoustics is the study of sound, and noise is defined as unwanted sound. Noise is a complex sound produced by various vibrations, often diffused and not harmonic. A noise is usually disturbing and unpleasant, whether the amplitude is high or low (for example, noise from mechanical systems, impact noise, loud music). Airborne sound is a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure creating a sound wave.

Ambient noise is the composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location. The pitch or loudness of sound determines whether a sound is of a pleasant or objectionable nature. Pitch, which is the height or depth of a tone or sound, is louder to humans when it is high-pitched

versus low-pitched. The loudness of a sound is determined by a combination of the intensity of the sound waves with the reception characteristics of the ear. Measurement scales are used to describe sounds. A dB is a unit used to describe the amplitude of sound, and sound levels are calculated on a logarithmic, not linear, basis. The lowest sound level that an unimpaired human ear can hear is described as zero on the decibel scale. Due to the logarithmic nature of measuring sound levels on the decibel scale, a 10 dB increase represents a tenfold increase in acoustic energy, whereas a 20 dB increase represents a hundredfold increase in acoustic energy. Because a relationship exists between acoustic energy and intensity, each 10 dB increase in sound level can have an approximate doubling effect on loudness as perceived by the human ear. The most common metric is the overall A-weighted sound level measurement (dBA) that has been adopted by regulatory bodies worldwide. The A-weighting network measures sound in a fashion similar to the way a person perceives or hears sound, thus achieving a very good correlation in terms of evaluating acceptable and unacceptable sound levels. Table 4.13-1 provides the relative A-weighted noise levels of common sounds measured in the environment and industry for various qualitative sound levels.

Table 4.13-1: Typical Sound Levels Measured in the Environment and Industry

Noise Source at a Given Distance	A-Weighted Sound Level (in decibels)	Qualitative Description
Carrier deck jet operation Jet takeoff (200 feet)	140 130 120	Pain threshold
Auto horn (3 feet) Jet takeoff (1,000 feet) Shout (0.5 feet)	110 100	Maximum vocal effort
Heavy truck (50 feet)	90	Very annoying; hearing damage (8-hour, continuous exposure)
Pneumatic drill (50 feet) Freight train (50 feet) Freeway traffic (50 feet)	80 70 to 80 70	Annoying Intrusive (telephone use difficult)
Air conditioning unit (20 feet) Light auto traffic (50 feet) Living room/bedroom	60 50 40	Quiet
Library/soft whisper (5 feet) Broadcasting/recording studio	30 20 10	Very quiet Just audible

Source: 2020/2021 SREIR (Kern County Planning and Natural Resources Department 2021)

A-weighted sound levels can be measured or presented as equivalent sound pressure level (L_{eq}). This is defined as the average noise level, on an equal-energy basis for a stated period of time and is commonly used to measure steady-state sound or noise that is usually dominant. Statistical

measurements are typically denoted by Ln, where "n" represents the percentile of time the sound level is exceeded. The L90 measurement represents the noise level that is exceeded during 90 percent of the measurement period. Similarly, the L10 measurement represents the noise level exceeded for 10 percent of the measurement period. The maximum noise level (L_{max}) is the maximum instantaneous noise level during a specific period of time.

Of particular interest in this analysis are other descriptors of noise that are commonly used to help determine noise/land use compatibility and predict an average community reaction to adverse effects of environmental noise, including traffic-generated, construction, and industrial noise. One of the most universal descriptors is the average day-night level (DNL or L_{dn}). As recommended by the California Health Department and State planning law, this descriptor is used by many planning agencies, including Kern County's Planning and Community Development Department. The L_{dn} noise metric represents a 24-hour period and applies a time-weighted factor designed to penalize noise events that occur during nighttime hours when relaxation and sleep disturbance are of more concern for average residents. Noise occurring during the daytime hours—between 7:00 a.m. and 10:00 p.m.—is measured in decibels. Noise occurring between 10:00 p.m. and 7:00 a.m., however, is effectively "penalized" by adding 10 dB to the measured level. In California, the use of the CNEL descriptor is also permitted. CNEL is identical to the day-night average sound level metric, except that CNEL adds a 5 dB penalty for noise occurring during evening hours between 7:00 p.m. and 10:00 p.m. as well as the 10 dB penalty added between 10:00 p.m. and 7:00 a.m.

The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. Ambient sounds generally range from 30 dB (very quiet) to 100 dB (very loud). As shown in Table 4.13-2, changes of 1 to 3 dB are detectable under quiet, controlled conditions, and changes of less than 1 dB are usually not discernible (even under ideal conditions). A 3 dB change in noise levels is considered the minimum change that is detectable with human hearing in outside environments. A change of 5 dB is readily discernible to most people in an exterior environment, and a 10 dB change is perceived as a doubling (or halving) of the sound.

Table 4.13-2: Noise Perceptibility

Noise Level	Listener Perception
± 3 dB	Threshold of human perceptibility
± 5 dB	Clearly noticeable change in noise level
± 10 dB	Half or twice as loud
± 20	Much quieter or louder

Source: Kern County Oil and Gas SREIR (2020/2021)
Key:
dB = decibels

Noise-Sensitive Land Uses

Noise-sensitive land uses, as defined in the Noise Element of the Kern County General Plan (KCGP; Kern County 2004), include houses and schools in the project vicinity. The sensitive receptor closest to the proposed project site is a small housing tract on Lost Hills Road, north of Lerdo Highway, roughly 3 miles east of the proposed project site. The community of Lost Hills is located 7 miles northeast of the proposed project site. Lost Hills Wonderful Park, a local park, is located approximately 7 miles northeast of the nearest injection well. There are five schools in the project vicinity (see Table 4.13-3). There are no sensitive receptors within the Conditional Use Permit boundary.

Table 4.13-3: Schools in the Vicinity of the Project Site

School Name	Student Population (2022-2023)	District	Distance to CUP Boundary (miles)	Distance to Closest Injection Well (miles)	Distance to Closest Facility Pipeline (miles)
Lost Hills Elementary School	180	Lost Hills Union Elementary	6.43	7.09	7.02
A. M. Thomas Middle School	82	Lost Hills Union Elementary	6.49	7.15	7.08
Wonderful College Prep Academy - Lost Hills	504	Kern County Office of Education	7.12	7.68	7.54
McKittrick Elementary School	79	McKittrick Elementary	8.68	17.30	11.41
Buttonwillow Elementary School	313	Buttonwillow Union Elementary	11.58	19.11	14.01

Key: CUP = Conditional Use Permit

Vibration

Vibration is defined as the mechanical motion of the ground, or buildings or other types of structures, that is induced by the operation of mechanical devices or equipment. Vibration generally results in an "oscillatory" motion, in terms of the displacement, velocity, or acceleration of the ground (or structure), that causes a person to be aware of the vibration by means such as, but not limited to, sensation by touch or visual observation of moving objects. The effects of ground-borne vibration include movements of building floors, rattling of windows, and shaking of items on shelves or hangings on the walls. In extreme cases, vibration can cause damage to buildings. The noise radiated from the motion of the room surfaces is called ground-borne noise. Table 4.13-4 presents typical levels of ground-borne vibration, vibration sources, and responses.

Table 4.13-4: Typical Levels of Ground-borne Vibration

Response	Velocity Level[(a)]	Typical Sources (at 50 feet)
Minor cosmetic damage of fragile buildings	100	Blasting from construction projects
Difficulty with tasks such as reading a video display terminal screen	90	Bulldozers and other heavy tracked construction equipment
Residential annoyance, infrequent events	80	Rapid transit, upper range
Residential annoyance, frequent events	70	High-speed rail, typical
Approximate threshold for human perception	60	Bus or truck, typical
None	50	Typical background vibration

Source: Kern County Oil and Gas SREIR (2020/2021)
Note:
[a] Root mean square vibration velocity level in vibration decibels relative to 10^{-6} inches per second.

Effects of Noise

The effects of noise on people can be grouped into four general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction
- Interference with activities such as speech, sleep, learning
- Physiological effects such as startling
- Physical effects such as hearing loss

In most cases, environmental noise produces effects in the first two categories of subjective effects and interference with activities only; however, workers in industrial plants might experience physiological effects of noise. There is no satisfactory way to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is due primarily to the wide variation in individual thresholds of annoyance and habituation to noise. Noise can interrupt ongoing activities and can result in community annoyance, especially in residential areas. In general, most residents become highly annoyed when noise interferes significantly with activities such as sleeping; talking; noise-sensitive work; and listening to the radio, TV, or music.

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dB. Exposure to high noise levels affects the entire human system, with prolonged noise exposure in excess of 75 dB increasing body tension and thereby affecting blood pressure, functions of the heart, and the nervous system. In comparison, extended periods of noise exposure above 90 dB could result in permanent hearing

damage. People may consider louder environments adverse, but in many cases, people will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dB) or urban or industrial areas (65 to 80 dB).

4.13.2 Environmental Setting

Existing Noise Environment

Existing land uses within the Belridge oilfields generally include oil and gas exploration and production and agricultural lands. An ambient noise study was conducted between June 15 and June 17, 2023, to characterize existing noise levels at the site and surrounding areas. Long-term (24-hour) ambient noise level measurements were conducted at four locations within the project vicinity (Figures 4.13-1 and 4.13-2). The sensitive receptor closest to the proposed project site is a small housing tract on Lost Hills Road, north of Lerdo Hwy, roughly three miles east of the proposed project site. The community of Lost Hills is located seven miles northeast of the proposed project site. Lost Hills Wonderful Park, a local park, is located approximately seven miles northeast of the nearest injection well (Figure 4.13-2).

Existing noise levels were measured at four different locations (two project sites and two noise-sensitive receptor properties). The two noise-sensitive receptor locations were used to fully determine the ambient noise levels on site and at neighboring properties. The two project site locations were used to determine existing ambient noise levels at significant project construction and operation locations, the Compressor Booster Station and the CO_2 Capture Facility. Noise measurements at each location lasted at least 24 hours.

The four measurement locations were divided into two measurement setups (Figures 4.13-1 and 4.13-2). The first measurement setup consisted of one sound meter at the Compressor Booster Station and another at the nearest residence located at 17059 West Side Highway, Lost Hills, California (Residence A), which is now legally demolished and the property is owned by Aera Energy (Figure 4.13-1). The second measurement consisted of one sound meter placed at the CO_2 capture facility and a second at the closest sensitive receptor, 17863 Lost Hills Road, McKittrick California, approximately 3.12 miles from the capture facility (Residence D) (Figure 4.13-2).

Figure 4.13-1: Measurement 1 Setup and Sound Meter Placement

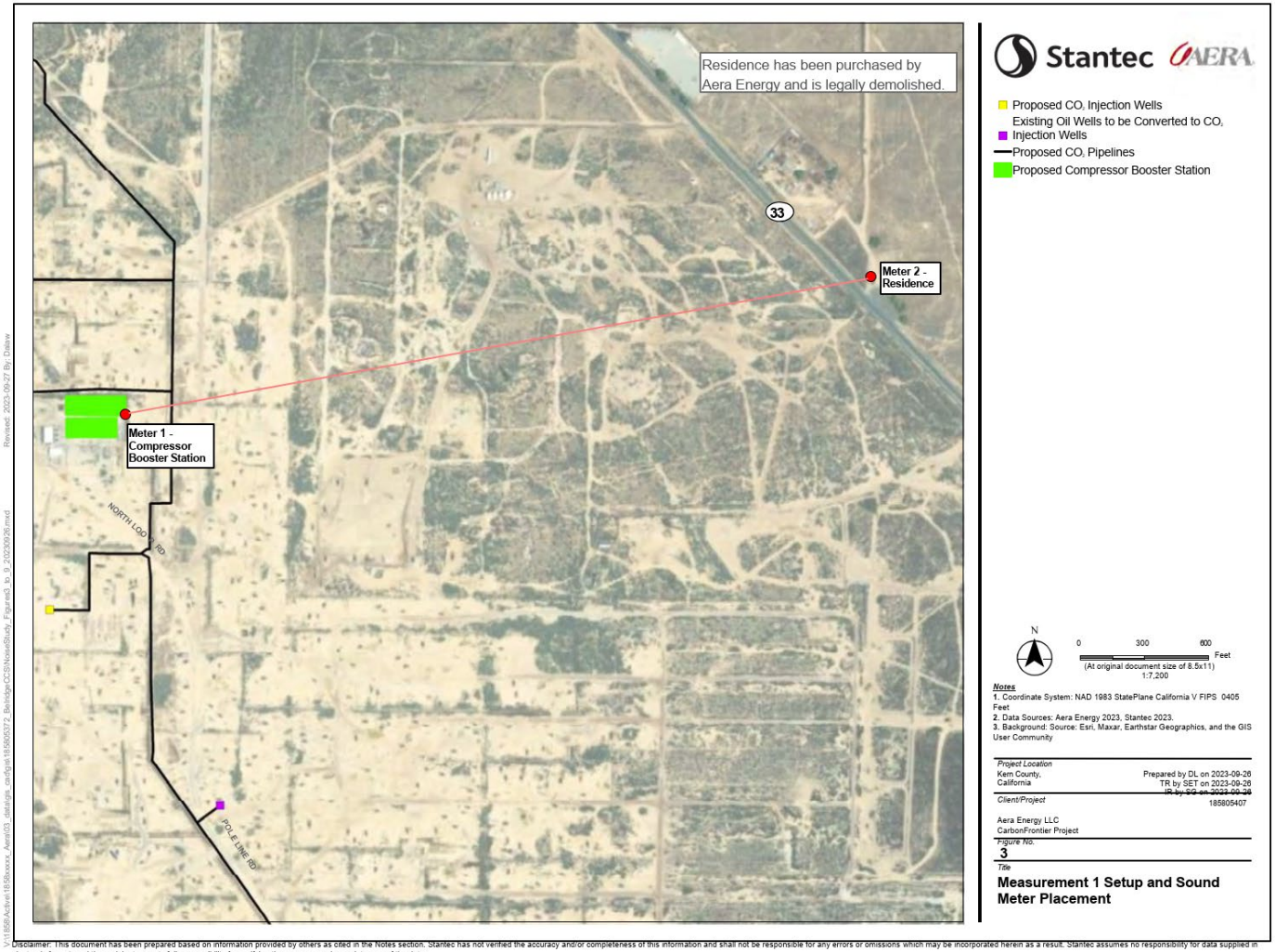
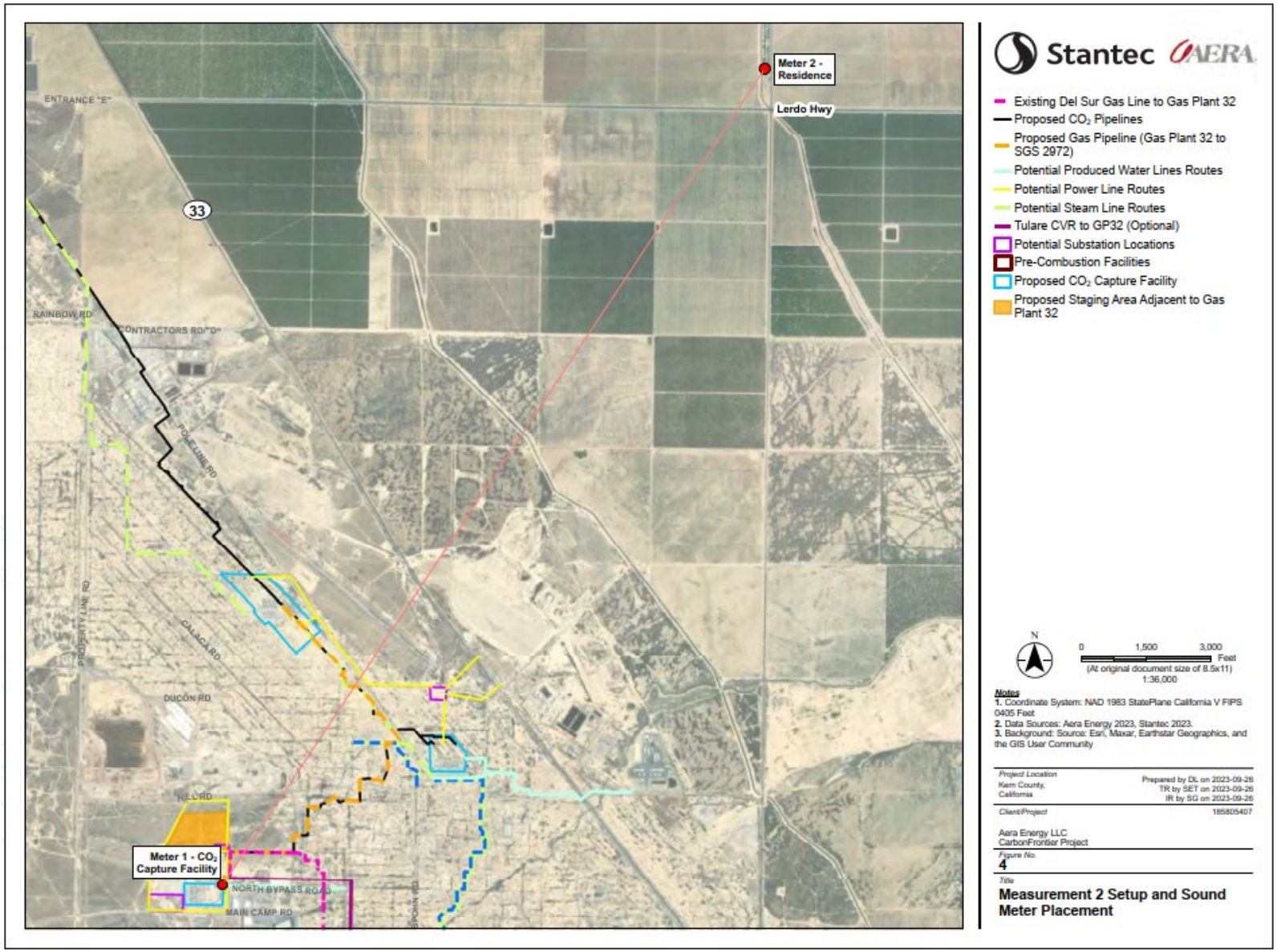


Figure 4.13-2: Measurement 2 Setup and Sound Meter Placement



Measured Noise Levels

Hourly ambient noise levels measured at the Compressor Booster Station ranged from 54 to 59 dBA and the corresponding levels at Residence A ranged from 48 to 55 dBA. The average measured noise level for the entire period was 57 dBA at the Compressor Booster Station and 51 dBA at Residence A.

Hourly ambient noise levels measured at the CO_2 capture facility ranged from 58 to 61 dBA and the corresponding levels at Residence D ranged from 53 to 67 dBA. The average measured noise level for the entire measurement period was 60 dBA at the CO_2 Capture Station and 61 dBA at Residence D.

4.13.3 Regulatory Setting

Federal

Federal highway and aircraft guidelines and regulations have been established by the Federal Highway Administration (FHWA) (23 Code of Federal Regulations [CFR] 772) and Federal Aviation Administration regulations (18 CFR 150). Federal guidelines and regulations are summarized in Table 4.13-5. These federal regulations do not apply to project activities but may be applicable to existing activities in the project area and also represent useful benchmarks for noise standards used by other agencies.

Table 4.13-5: Federal Guidelines and Regulations for Exterior Noise (dBA)

Agency	L_{eq}	DNL
Federal Energy Regulatory Commission	[49]	55
U.S. Department of Transportation (construction noise level at residential land use during daytime)	90	---
Federal Highway Administration	67	[67]
Federal Aviation Administration	[59]	65
U.S. Department of Housing and Urban Development	[59]	65

Sources: FTA 2006; 24 CFR 51B; HUD 1991

Note: Brackets around numbers (e.g., [59]) indicate a calculated equivalent standard. Because the FHWA regulates peak noise level, the DNL is assumed equivalent to the peak noise hour.

Key:
DNL = average day-night level
L_{eq} = equivalent sound pressure level

Occupational Safety and Health Act of 1970

On-site noise levels are regulated by the Occupational Safety and Health Administration (OSHA). This regulation protects workers from the effects of occupational noise exposure. The noise exposure level of workers is regulated at 90 dBA over an 8-hour work shift to protect hearing (29 CFR 1910.95). Employee exposure to levels exceeding 85 dBA requires that employers develop a hearing conservation program. Such programs include adequate warning, the provision of hearing protection devices, and periodic employee testing for hearing loss.

State

California Division of Occupational Safety and Health

The California Division of Occupational Safety and Health implements and enforces the noise exposure limits established by the federal OSHA, as described above, for the State of California. No State regulations apply to noise specifically for the proposed project; however, there are general State guidelines provided by the California Department of Health Services that define acceptable noise levels based on a land use compatibility matrix designed to protect residents and other sensitive land uses from excessive noise levels. These guidelines help to define a threshold for acceptable noise levels for residential areas in the project area. The California Department of Health Services has identified DNL or CNEL values of 60 dBA or less as normally acceptable outdoor levels for residential areas.

California Noise Control Act of 1973

Sections 46000 through 46080 of the California Health and Safety Code, known as the California Noise Control Act of 1973, declares that excessive noise is a serious hazard to the public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. It also identifies a continuous and increasing bombardment of noise in the urban, suburban, and rural areas. The California Noise Control Act declares that the State of California has a responsibility to protect the health and welfare of its citizens by controlling, preventing, and abating noise. It is the policy of the State to provide an environment for all Californians free from noise that jeopardizes their health or welfare.

California Department of Transportation Construction Vibration Guidance Manual

One of the most recent references suggesting vibration guidelines is the California Department of Transportation (Caltrans) Transportation and Construction Vibration Guidance Manual (Caltrans 2013). The manual provides guidance for determining annoyance potential criteria and damage potential threshold criteria. These criteria are provided in Table 4.13-6 and Table 4.13-7 and are presented in terms of peak particle velocity in inches per second.

Table 4.13-6: Caltrans Guideline Vibration Annoyance Potential Criteria

	Maximum Peak Particle Velocity (inches per second)	
Human Response	**Transient Sources**	**Continuous/Frequent Intermittent Sources**
Barely Perceptible	0.04	0.01
Distinctly Perceptible	0.25	0.04
Strongly Perceptible	0.9	0.1
Severe	2.0	0.4

Source: Caltrans 2013

Table 4.13-7: Caltrans Guideline Vibration Damage Potential Threshold Criteria

Structure and Condition	Maximum Peak Particle Velocity (inches per second)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile, historic buildings, ancient monuments	0.13	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: Caltrans 2013

Local

Noise Level Standards

Kern County General Plan

The Kern County Noise Element of the KCGP (Noise Element) establishes noise level criteria in terms of the Day-Night Average Level (L_{dn}) metric. The L_{dn} is the time-weighted energy average noise level for a 24-hour day, with a 10 dB penalty added to noise levels occurring during the nighttime hours (10:00 p.m.-7:00 a.m.). The L_{dn} represents cumulative exposure to noise over an extended period of time and is, therefore, calculated based upon annual average conditions.

The Noise Element establishes a land use compatibility criterion of 65 dB L_{dn} for exterior noise levels in outdoor activity areas of residential uses. Outdoor activity areas generally include backyards of single-family residences and individual patios or decks of multi-family developments. The intent of the exterior noise level requirement is to provide an acceptable noise environment for outdoor activities and recreation.

The Noise Element also requires that interior noise levels attributable to exterior noise sources do not exceed 45 dB L_{dn}. The intent of the interior noise level standard is to provide an acceptable noise environment for indoor communication and sleep. Excerpts from the KCGP Noise Element relevant to the proposed project are provided below.

The following noise-sensitive land uses have been identified in the County:

- Residential areas
- Schools
- Convalescent and acute care hospitals
- Parks and recreational areas
- Churches

Goals

Goal 1. Ensure that residents of Kern County are protected from excessive noise and that moderate levels of noise are maintained.

Goal 2. Protect the economic base of Kern County by preventing the encroachment of incompatible land uses near known noise-producing roadways, industries, railroads, airports, oil and gas extraction, and other sources.

Policies

Policy 2. Require noise level criteria applied to all categories of land uses to be consistent with the recommendations of the California Division of Occupational Safety and Health.

Policy 3. Encourage vegetation and landscaping along roadways and adjacent to other noise sources in order to increase absorption of noise.

Policy 4. Utilize good land use planning principles to reduce conflicts related to noise emissions.

Policy 5. Prohibit new noise-sensitive land uses in noise-impacted areas unless effective mitigation measures are incorporated into the project design. Such mitigation shall be designed to reduce noise to the following levels:

(a) 65 dB L_{dn} or less in outdoor activity areas; and

(b) 45 dB L_{dn} or less within interior living spaces or other noise-sensitive interior spaces.

Policy 6. Ensure that new development in the vicinity of airports will be compatible with existing and projected airport noise levels as set forth in the Airport Land Use Compatibility Plan.

Policy 7. Employ the best available methods of noise control.

Implementation Measures

The following are programs to be carried out by Kern County to implement the goals and policies of the Noise Element.

Implementation Measure A. Utilize zoning regulations to assist in achieving noise-compatible land use patterns.

Implementation Measure C. Review discretionary development plans, programs, and proposals, including those initiated by both the public and private sectors, to ascertain and ensure their conformance to the policies outlined in this element.

Implementation Measure E. Review discretionary development plans to ensure compatibility with adopted Airport Land Use Compatibility Plans.

Implementation Measure F. Require proposed commercial and industrial uses or operations to be designed or arranged so that they will not subject residential or other noise-sensitive land uses to exterior noise levels exceeding 65 dB L_{dn} and interior noise levels exceeding 45 dB L_{dn}.

Implementation Measure G. At the time of any discretionary approval, such as a request for a General Plan Amendment, zone change, or subdivision, the developer may be required to submit an acoustical report indicating the means by which the developer proposes to comply with the noise standards. The acoustical report shall:

a) Be the responsibility of the applicant.

b) Be prepared by a qualified acoustical consultant experienced in the fields of environmental noise assessment and architectural acoustics.

c) Be subject to the review and approval of the Kern County Planning Department and the Environmental Health Services Department. All recommendations therein shall be complied with prior to final approval of the project.

Implementation Measure I. Noise analyses shall include recommended mitigation measure, if required, and shall:

(a) Include representative noise level measurements with sufficient sampling periods and location to adequately describe local conditions.
(b) Include estimated noise levels, in terms of CNEL, for existing and projected future (10 to 20 years hence) conditions, with a comparison made to the adopted policies of the Noise Element.
(c) Include recommendations for appropriate mitigation to achieve compliance with the adopted polices and standards of the Noise Element.
(d) Include estimates of noise exposure after the prescribed mitigation measures have been implemented. If compliance with the adopted standards and policies of the Noise Element will not be achieved, a rationale for acceptance of this project must be provided.

Implementation Measure J. Develop implementation procedures to ensure that requirements imposed pursuant to the findings of an acoustical analysis are conducted as part of the project permitting process.

Kern County Code of Ordinances

Section 8.36 (Noise Control) of the Kern County Code of Ordinances limits construction to the hours of 6:00 a.m. to 9:00 p.m. on weekdays, and between 8:00 a.m. and 9:00 p.m. on weekends, when construction is within 1,000 feet of a residence (Kern County 2007). Certain exceptions to these hours are specified in the Code. The Code does not list specific noise level limits for fixed-source equipment.

4.13.4 Impacts and Mitigation

Methodology

Noise impacts associated with the proposed project assessed in this section are based primarily on technical documents by Stantec Consulting Services Inc. for the project—specifically, the Noise Study (Stantec 2023, Appendix H) and the Traffic Impact Study (Stantec 2023, Appendix I). As discussed in Section 4.13.2, the residence located at 17059 West Side Highway, Lost Hills, California was included in the Noise Study prior to its legal demolition.

SoundPLAN Predictive Model

As explained in Appendix H, four new-site configurations were considered for SoundPLAN predictive noise models to predict noise levels that could potentially be produced by the new carbon capture and storage (CCS) facility. The four site configurations are defined as follows: 1) Pre-C Cogen 32 Layout; 2) Post-C Cogen 32 Layout; 3) Post-C SGS 2868 Layout; and 4) Post-C SGS 2972. The following conditions and assumptions were included in the exterior noise analysis of the project:

- The noise levels generated from the project were calculated using SoundPLAN acoustic modeling software. SoundPLAN uses standardized prediction techniques (per International Organization for Standardization [ISO] 9613) and accounts for distance, topography, vegetation, and the effect of shielding and reflections produced by buildings and acoustic barriers. All receptors were positioned at 5 feet above ground level.

- Due to the absence of specific selected equipment, and consequently, the absence of specific equipment noise levels, each model used internal SoundPLAN data as a baseline for the equipment that will be used for each measurement configuration. The analysis considered noise generated from three types of equipment, compressors, pumps, and steam generators. The SoundPLAN-generated sound power level data for the equipment used in the model are as follows:

    - Steam Generators – 113.6 dB(A)

    - Compressors – 129 dB(A)

    - Pumps – 108.6 dB(A)

- The equipment was set to run 24 hours a day in the model and used a conservative single sound power level at 500 hertz (Hz). The noise level generated by the actual equipment, especially the compressors and pumps, will most likely be quieter. Estimates produced for this analysis may be revised if more accurate equipment placement and noise data are provided.

- The SoundPLAN model assumes an open fence around the project. Therefore, no additional losses from barriers or fencing were included in the model.

Thresholds of Significance

The Kern County California Environmental Quality Act (CEQA) Implementation Document and Kern County Environmental Checklist identify the following criteria, as established in Appendix G of the CEQA Guidelines, to determine if a project could potentially have a significant noise-related adverse effect. The thresholds identified in Appendix G of the guidelines indicate that a project would normally be considered to have a significant impact if it would result in:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generation of excessive ground-borne vibration or ground-borne noise levels;
- For a project located within the Kern County Airport Land Use Compatibility Plan, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels.

Project Impacts

Impact 4.13-1: Generation of a Substantial Temporary or Permanent Increase in Ambient Noise Levels in the Vicinity of the Project in Excess of Standards Established in the Local General Plan or Noise Ordinance, or Applicable Standards of Other Agencies

The KCGP applies an exterior noise level standard of 65 dB DNL for defined noise-sensitive receptors. A substantial permanent increase in ambient noise levels would occur if the noise level increase exceeded 65 dBA CNEL. This analysis examined both temporary and operational noise levels.

Construction Impacts

Short-term construction noise impacts could result from land clearing and grading for well pads and work areas; injection well pad construction; construction/maintenance of access roads; construction of accessory facilities (including pipelines, electrical transmission lines, drilling sumps, or temporary storage tanks); transporting the drilling rig, associated equipment, workers, and materials to the well pad site; well drilling; well plugging and abandonment activities; installation of CO_2 distribution pipelines; installation of intra-field electrical distribution; well hookup activities; and construction equipment operations. Project construction is expected to take up to three years. However, construction duration may vary based on factors such as weather, seasonal environmental constraints, resource availability, or various site-specific conditions. The following list is the different construction phases and the following sections describe each phase and its temporary construction impacts:

- Well Construction, Drilling, Completion, and Decommissioning
- CO_2 Capture and Processing Facilities Construction

- CO_2 Pipeline Construction
- Field Systems Construction
- Electrical Transmission Power Line Construction

Well Construction, Drilling, Completion, and Decommissioning

The well drilling activities phase of the proposed project includes several components, including drilling of new injection wells, conversion of existing wells to injection wells, monitoring and seismic monitoring wells, and abandonment activities. Construction activities would include well pad site preparation activities, such as geophysical surveys, land clearing and grading for well pads, access road construction or improvement, construction of temporary drilling sumps, installation, completion, and initial operation (testing) of new wells and ancillary equipment, installation of temporary equipment and facilities such as storage tanks or drilling sumps, spill prevention activities, downhole monitoring equipment installation, and well decommissioning activities. Construction activities would result in temporarily elevated noise levels.

During the preparation of the Kern County Oil and Gas EIR, noise level measurements were conducted for numerous drill rigs, in December 2014 and January 2015. These noise level measurements were used as inputs into the SoundPLAN ISO 9613 to calculate noise exposure levels in terms of the DNL, which is the noise metric applicable to the Kern County noise level standards. The largest and loudest of these measured drill rigs was the exploratory rig, Kenai No. 7. As the noise levels associated with this rig represent a worst-case assessment of drilling noise levels, they are applied for this analysis. Additionally, the analysis applied the loudest measured noise levels, as measured from various positions around the rig, while in operation, and assumed that these noise levels would be constant over a 24-hour period. As such, modeled noise levels should be considered a worst-case assessment of project-related well-drilling activities. It is also important to recognize that, in scenarios where the topography is relatively flat or there is a steady slope away from a sound source located on a hill, the SoundPLAN ISO 9613 method is overly conservative and can over-predict noise by up to 6 dB, even where line-of-sight from the receiver location to the turbine hub is not broken. The model included the loudest observed noise measurement for each source as a basis for modeling potential project-related noise exposure. The model included no shielding as a result of buildings or other structures that may be in the sound propagation path. These assumptions represent a highly conservative, worst-case assessment regarding noise propagation from individual sources.

Well decommissioning and abandonment would entail plugging and abandoning wells once they are no longer productive. Well decommissioning and abandonment would involve removal, disassembly, and salvage or disposal of pumping units, well cellars, pipelines, and associated infrastructure, plugging the well with concrete and steel plates, and restoration of the well pad. Equipment used for decommissioning and abandonment varies somewhat from that used for construction but would be expected to generate similar or lesser noise levels. Typical equipment used on site for decommissioning and abandonment may include bulldozers, motor graders, front-end loaders, cement trucks, and dump trucks.

The County noise level standard applicable to the proposed project area is 65 dB L_{dn} or an incremental noise increase of not over 5 dB. The SoundPLAN ISO 9613 was used to calculate setback distances to various noise contours for Kenai No. 7 Rig. The modeled distance from the rig to the 65 dB L_{dn} noise level contour was 3,270 feet (approximately 0.6 miles). As described above, the closest residential sensitive receptors to the project area are at setback distances of almost 5 miles or greater. At a setback distance of 4 to 5 miles, noise levels associated with the large-scale exploratory rig would be approximately 47 dB L_{dn}.

These conceptual noise levels do not take into account any acoustical shielding that would occur from intervening topography or any atmospheric or ground absorption or any required mitigation. Therefore, they are considered a worst-case assessment of noise levels associated with drilling activities and construction activity at nearby sensitive receptor locations.

CO_2 Capture and Processing Facilities Construction

Construction of the capture and processing facilities would include the following activities:

- Site preparation
- Construction of access and site internal roads
- Grading and earthwork
- Dust control
- Concrete foundations
- Major equipment installation
- Structural steel work
- Electrical/instrumentation work
- Stormwater management facilities
- Architecture and landscaping

As further described in Chapter 3, *Project Description*, construction of the CO_2 and processing facility would occur over an approximate three-year construction period. These construction activities would take place at a setback distance of 4 to 5 miles or greater from surrounding sensitive receptors. Implementation of Mitigation Measure (MM) 4.13-1 would further ensure that noise levels associated with the CO_2 capture and processing facility construction activities would fall below KCGP noise level thresholds and would, therefore, not conflict with local policies or ordinances.

Pipeline Construction Activities

New pipe would be installed above ground only at the connection to the capture facility site and underground for the length of the pipeline, using primarily traditional cut and cover trenching techniques with short jack and bores used for road crossings, if necessary. The proposed project also includes establishing a temporary construction corridor, temporary storage and laydown areas, and hydrostatic testing. It is anticipated that a total of up to 14 miles of up to 12-inch pipeline would be constructed.

Pipeline construction is likely to occur on multiple pipeline sections at once. Pipeline installation rates depend on terrain and other site-specific conditions and the number of welds required in the trench. Other work related to the facilities may also overlap with the pipeline construction work. Idling and purging would occur after the new pipeline for each phase of construction is operational. Together, with a setback distance of 4 to 5 miles or greater from surrounding sensitive receptors, and the required implementation of MM 4.13-1, noise levels associated with pipeline construction activities would fall below the KCGP threshold of 65 dB L_{dn} for exterior noise levels in outdoor activity areas of residential uses and 45 dB L_{dn} for interior noise levels attributable to exterior noise sources. Pipeline construction activities would therefore not conflict with any local policies or ordinances.

Field Systems Construction

Field systems construction would include the installation of a system of on-site gathering and distribution lines for various co-located services, including produced gas pipelines, and steam distribution. The field gathering and distribution system would be designed to locate pipeline corridors primarily along existing pipeline corridors. The sequence of construction procedures associated with the intra-field pipeline installation would be similar to the CO_2 pipeline construction and would include the following activities:

- Clearing and grading
- Hauling and stringing
- Pipe bending and welding
- Pipe installation and testing

The intra-field electrical distribution system would be constructed concurrently with injection well drilling, re-purposing, and CO_2 capture facility construction. Field system construction activities would take place at a setback distance of 4 to 5 miles or greater from surrounding sensitive receptors. Implementation of MM 4.13-1 would further ensure that noise levels associated with CO_2 and processing facility construction activities would fall below KCGP noise level thresholds and would, therefore, not conflict with local policies or ordinances.

Electrical Transmission Power Line Construction

As described in Chapter 3, *Project Description*, the project proposes to construct and maintain 1.26 miles of new 115-kilovolt transmission lines to the substations located within the project site. To support the major construction efforts, electrical connections are anticipated to be in place prior to significant field activities, which would require the installation of 17 wooden poles. Construction of the power line interconnection would involve temporary ground disturbance around each new power pole location (an approximately 50-foot radius) as well as temporary ground disturbance associated with access to each pole location (approximately a 15-foot-wide access route). All new poles and access thereto would be located within existing oil field production areas or along a dirt road. Transmission power line construction is anticipated to take approximately six months.

Electrical transmission power line construction activities would take place at a setback distance of 4 to 5 miles or greater from surrounding sensitive receptors. Implementation of MM 4.13-1 would

further ensure that noise levels associated with power line construction activities would fall below KCGP noise level thresholds and would, therefore, not conflict with local policies or ordinances.

Construction Traffic Noise

The proposed project would result in a temporary increase in vehicle trips during the construction phases. During construction, heavy-duty trucks (for example, construction material delivery and dump trucks and water delivery trucks) and construction worker vehicles would be the main sources of trip generation.

A construction trip generation analysis included in Appendix I describes the anticipated project-related daily trips for the project phases identified above. The analysis specifies that various components of construction of the proposed project would generate 300 daily worker trips (150 trips during the AM or PM peak hour) and 15 daily construction vehicle trips. As mentioned in Section 4.17, *Transportation and Traffic*, construction traffic would be temporary and would not permanently affect vehicle miles traveled characteristics in this part of Kern County or elsewhere. Though there may be periodic overlap of construction phases, it would be for a limited time and would be limited to within the existing Belridge oilfield facility boundaries. Additionally, there are no sensitive receptors within the project area. Sensitive receptors reside 4 to 5 miles or greater from any construction activities. Therefore, temporary noise levels relating to construction traffic would not generally result in any increase in traffic noise exposure levels along roadways in the project vicinity and would not generate a substantial temporary increase in ambient noise levels at nearby sensitive receptor locations.

Conclusion

Because construction activities would take place 4 to 5 miles or more from surrounding sensitive receptors, construction noise levels are not expected to be audible over existing ambient noise levels at the sensitive receptor locations. With the implementation of MM 4.13-1, noise levels are expected to be below the maximum day-night noise levels listed in Implementation Measure F in the KCGP. There are also no local residences within the project area that would be impacted by construction noise. Additionally, temporary noise levels relating to construction traffic would not generally result in any increase in traffic noise exposure levels along roadways in the project vicinity.

Therefore, the proposed project would not generate a substantial temporary increase in ambient noise levels at nearby sensitive receptor locations, and impacts would be less than significant.

Operational Impacts

The CEQA Guidelines require evaluation of noise impacts against the standards developed by the pertinent local agency. As discussed above, project activities would occur within the boundaries of the KCGP. The Noise Element of the KCGP establishes a land use compatibility criterion of 65 dB L_{dn} for exterior noise levels in outdoor activity areas of residential uses with an additional noise level for oil and gas operations for an incremental increase of no more than 5 dB over ambient. As described in Section 4.13.2, *Environmental Setting*, there are no noise-sensitive land uses located within the project area. Local residences that could be potentially impacted by operational noise are located outside the project area. Therefore, long-term (24-hour) ambient noise measurements were conducted at two off-site locations within the greater project area, which included the nearest sensitive noise receptors (refer to Appendix H).

Stationary Noise Sources

The stationary noise source locations used in the SoundPLAN model were based on the preliminary equipment locations provided by Aera Energy (Appendix H). For the models, only compressors, pumps, and generators were used.

Using the assumed sound level data for the project, the configuration of the project equipment, and the assumptions above, the worst-case modeled noise levels expected from the project site were evaluated. Day-night noise level contours of noise from the project to the surrounding areas are provided on Figures 4.13-3 through 4.13-7. All modeled noise levels assume a worst-case scenario with all equipment operating 24 hours a day.

As shown on Figures 4.13-3 through 4.13-7, the modeled noise levels from the project at all nearby residential homes are expected to be below the maximum day-night noise levels listed in Implementation Measure F in the KCGP. Local residences that could potentially be impacted are located at a significant distance from the project site. Buildings depicted on Figures 4.13-3 through 4.13-7 are owned by Aera Energy, therefore, there are no local residences within an area that would be impacted by operational noise.

Figure 4.13-3: Contour Plots for Pre-C Cogen 32 Layout

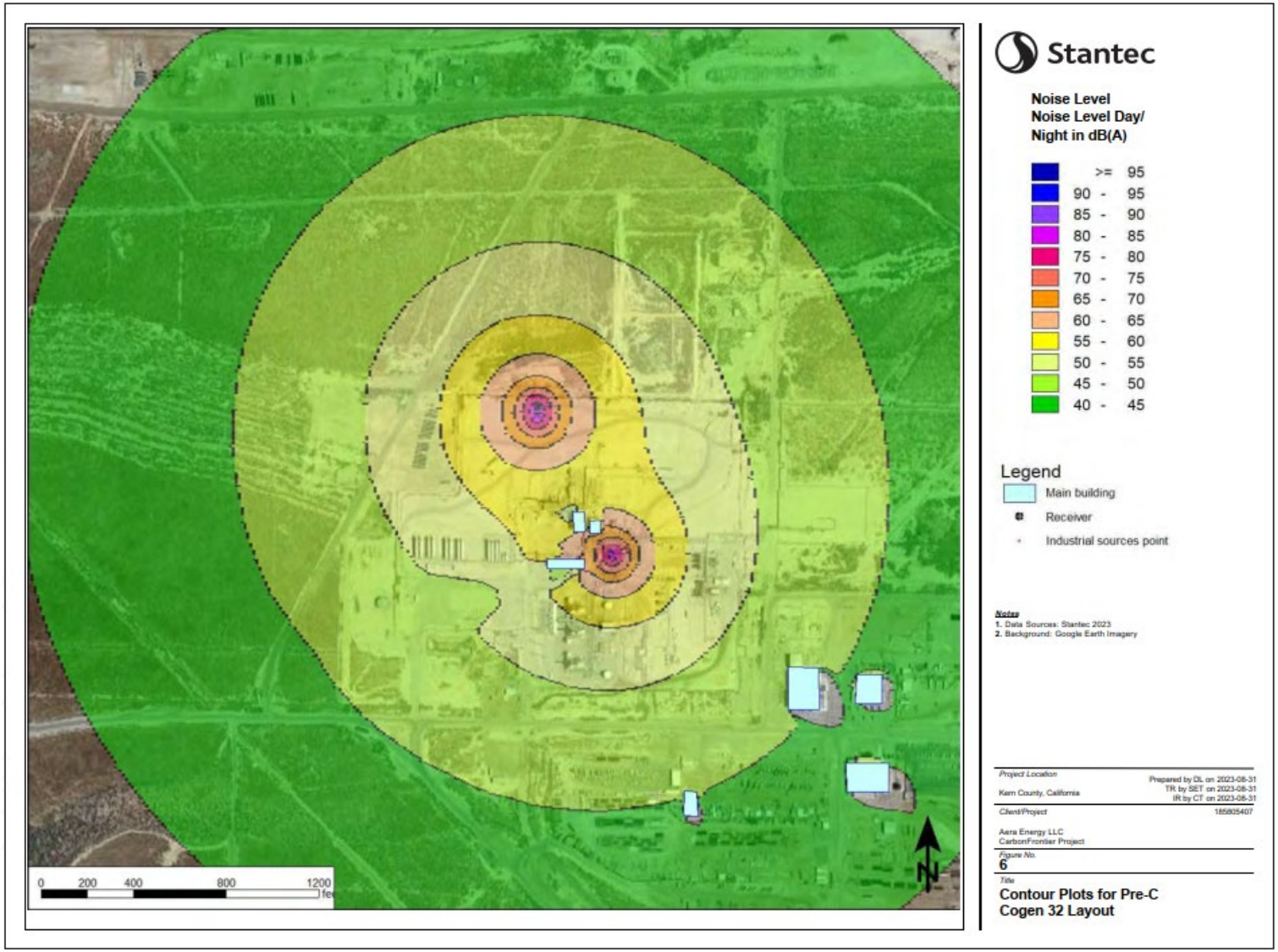


Figure 4.13-4: Contour Plots for Post-C Cogen 32 Layout

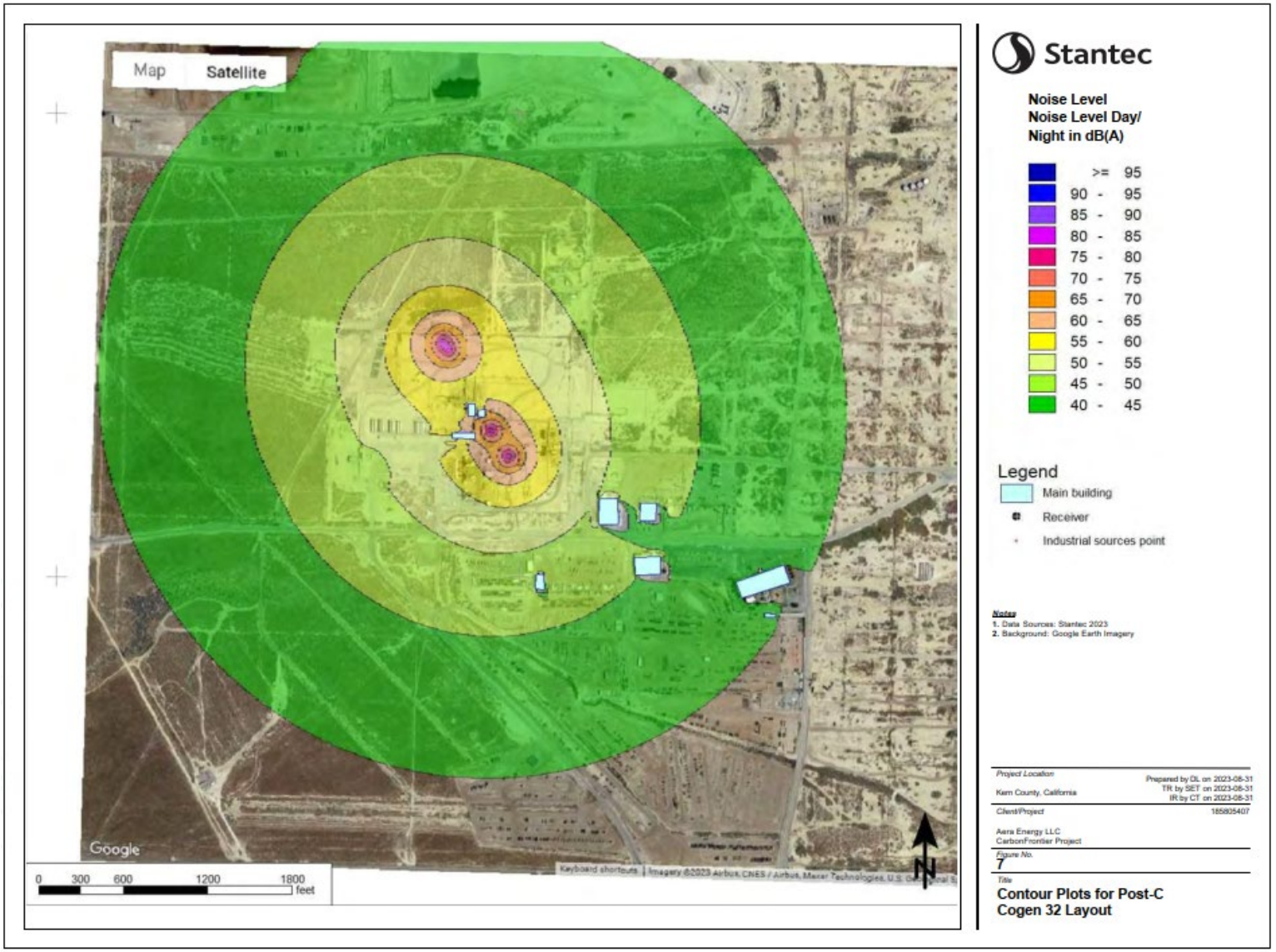


Figure 4.13-5: Contour Plots for Post-C SGS 2868 Layout

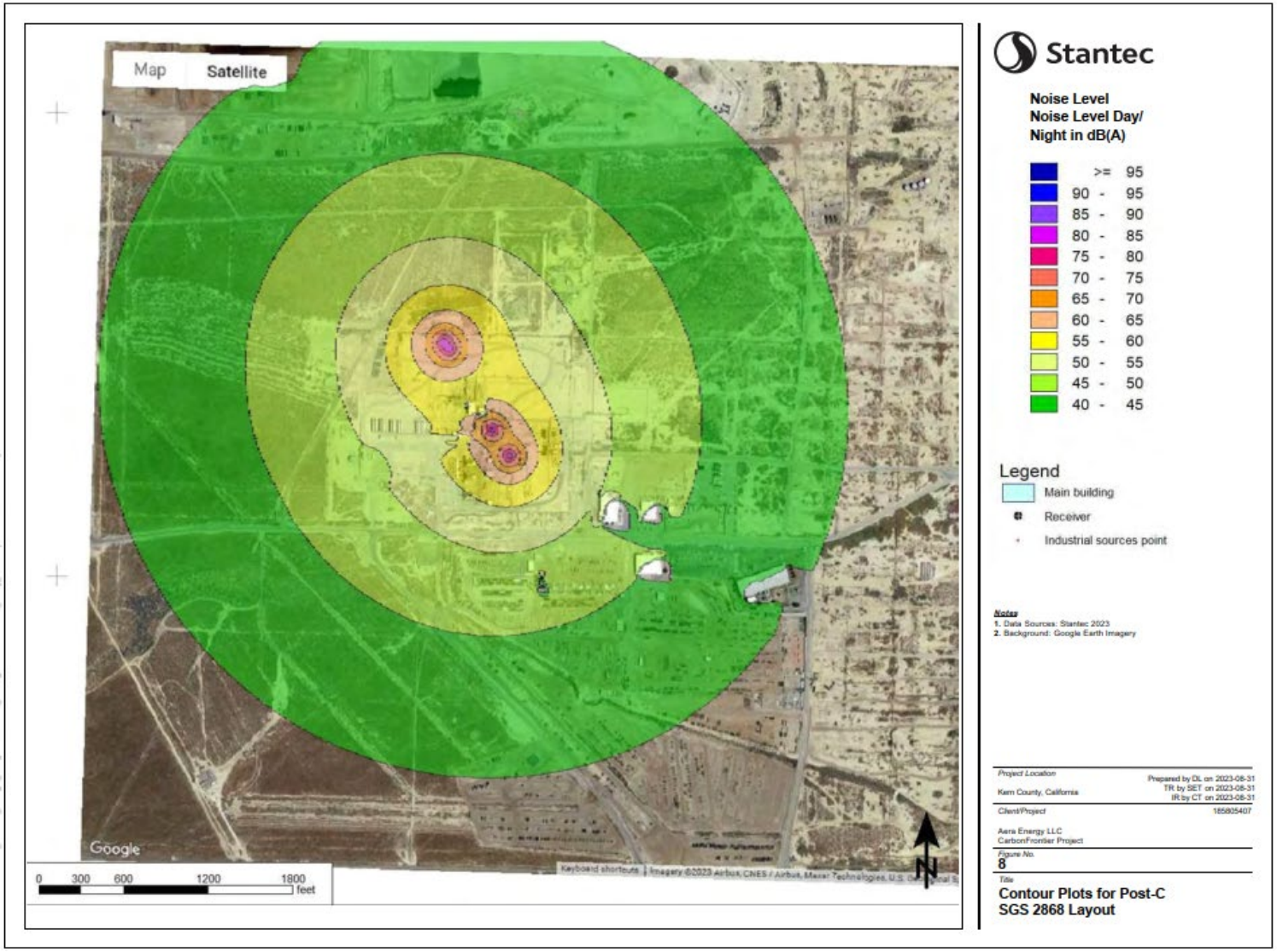
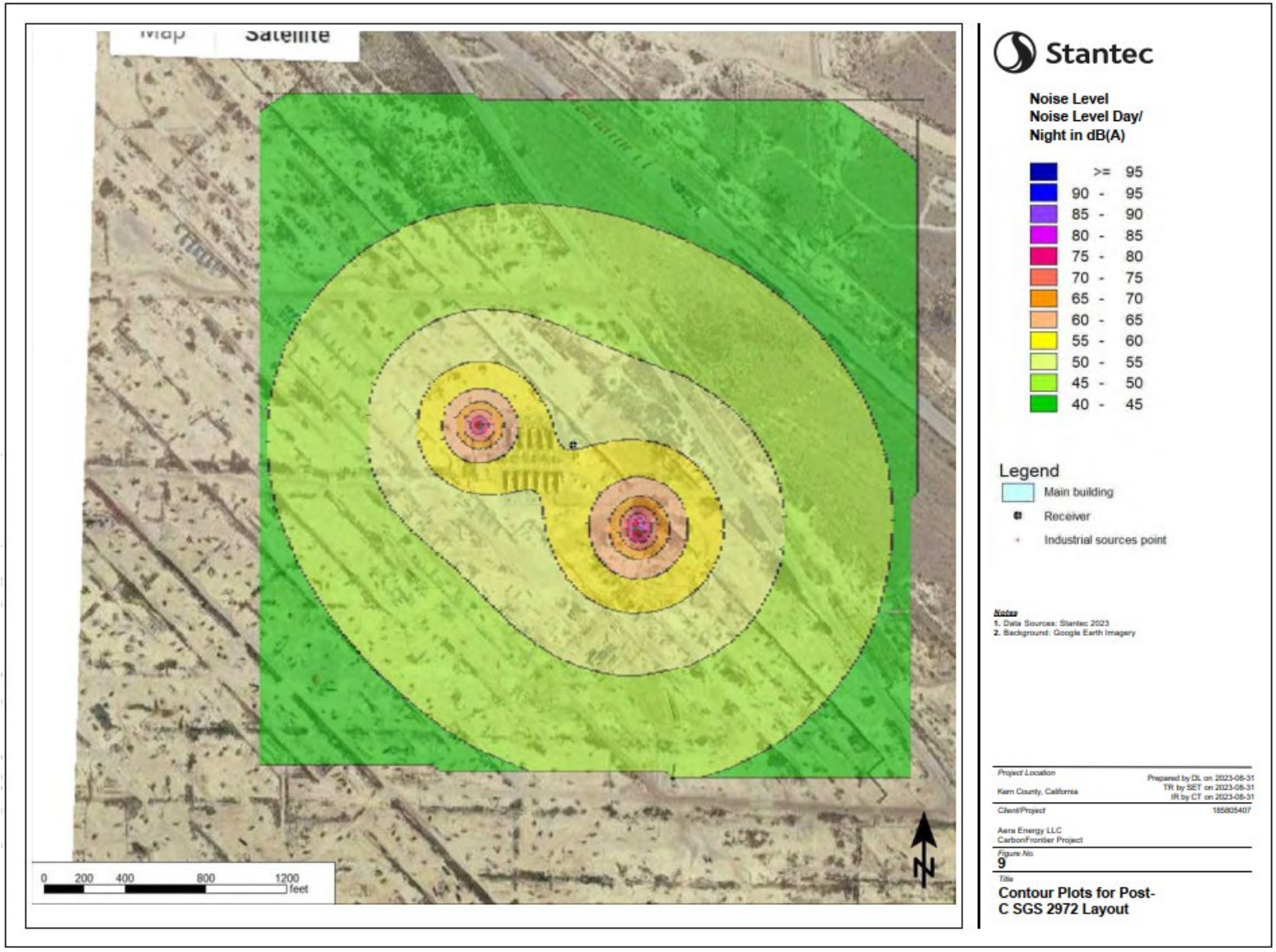


Figure 4.13-6: Contour Plots for Post-C SGS 2972 Layout



Operational Traffic Noise

Operation of the project would include 10 full-time employees who would operate the facility seven days a week, 24 hours a day. Assuming 10 employees per day, there would be approximately 25 trips per day based on an average rate of 2.5 trips per employee, which would include daily operation and periodic maintenance trips. It is noted that the maintenance or repair work would occur periodically, and there would generally only be one trip in the peak hour. Additionally, there are no sensitive receptors within the project area. Sensitive receptors reside 4 to 5 miles or greater from the project area. Due to the minimal amount of traffic increase during project operation, operational traffic would not result in a substantial increase in traffic noise exposure levels along roadways in the project vicinity and would not generate a substantial increase in ambient noise levels at nearby sensitive receptor locations.

Summary

The operational noise levels would not be audible over the existing ambient noise levels of the operational power plant and oilfield. Additionally, project-related traffic noise would not result in any increase in traffic noise exposure levels along roadways in the project vicinity.

There are no sensitive receptors closer than 2 miles to a construction site, and there would be no permanent operations of the injection well closer than 4 to 5 miles. The standard for oil and gas requires that the ambient level at any sensitive receptor as defined within 4,000 feet of construction or operational facilities for the project shall be under 65 dB. If the ambient level would be over 65 dB at the site, it cannot exceed 5 dB due to the project noise impacts. MM 4.13-1 provides for the study required before construction and a study when injection operations begin. The study will verify the acoustical study conclusions and, if the proposed project exceeds the noise limits at the property line of the sensitive receptor, provide for measures for sound reduction and monitoring.

Mitigation Measures

To ensure no future sensitive receptors would be impacted by the proposed project, MM 4.13-1 would be implemented.

MM 4.13-1 **CONSTRUCTION** Prior to issuance of any grading or construction permits, the owner/operator shall comply with the following noise information regarding both construction and operations phase of the project.

1. Noise Site Map A map showing the location of any sensitive receptors within 4,000 feet of the construction activity. A sensitive receptor is defined as a single or multi-family dwelling unit, place of public assembly (a legally permitted place where 100 or more people gather together in a building or structure for the purpose of amusement, entertainment, or retail sales), church, institution, school, or hospital. If there are no sensitive receptors within the 4,000-foot potential impact area, then no construction or operational noise measures shall be required.
2. **Noise Standards**

1. For locations where the ambient level is below 65 dB, noise levels from operation of the well may not increase the existing ambient level at the property line of the sensitive receptor by more than 5dB and may not exceed 65 dB at the property line of the sensitive receptor.
2. For locations where the ambient level is at or in excess of 65 dB, noise levels from operation of the well may not increase the existing ambient level at the property line of the sensitive receptor by more than 1 dB.

3. Acoustic Noise Reduction Report

1. An Acoustic Noise Reduction Report completed by a qualified professional shall be provided if there are sensitive receptors within 4,000 feet. The report and submitted site vicinity map shall include all dimensions and detailed notes, based on the Acoustic Noise Reduction Report detailed in this measure.
2. Clearly marked distances in feet and with coordinates from the construction location on the well site to the nearest sensitive receptors both exterior wall of the receptor and the property line within the potential impact area.
3. Notes showing the average day-night level (DNL or Ldn) of ambient outdoor noise level at the proposed well location and at the property line of the nearest identified sensitive receptors that face the drill site over a 24-hour period.
4. Specific details from the Acoustic Noise Reduction Report specifying the level of project activity noise at the property line of the sensitive receptor allowed under the noise standard and the projected level of noise from the project.
5. The report shall identify and include the specific noise reduction method or methods that will be implemented and shall not include options for compliance. Any changes to the selected method or methods of compliance after approval will require submission of an amended Acoustic Noise Reduction Report reflecting the new selection.

4. Construction

1. Placement of a temporary sound attenuation wall(s) on property controlled by the applicant or with written permission from the property owner.
2. Construction of a temporary berm on property controlled by the applicant or with written permission from the property owner/

3. Specific orientation of the drilling equipment on the well site and modification of equipment to reduce noise impacts.
4. Implementation of other detailed sound reduction technologies or practices with evidence from the qualified professional of the reductions achieved.
5. Written confirmation from the occupants of the sensitive receptor(s) of their voluntary, temporary relocation or business restrictions during a defined construction period.

5. Operation

1. A permanent barrier wall or combination wall and berm that will reduce the noise level from operations to meet the standard. Installation to be completed before commencement of operation of capture equipment and first injection of CO_2.
2. Changes in operational equipment or tempo of operations that will reduce the noise level from operations to meet the standard.

6. Monitoring

Construction

1. For the duration of the construction the following measurements shall be submitted to the Kern County Planning and Natural Resources Department at the required intervals. The measurements shall show achievement of the stated average day and night noise level stated on the Site Plan. If the measurement does not show the level is achieved, additional measures must be proposed and installed to prevent a stop work notice. Failure to submit within one business day after taking the required measurements will result in a stop work notice.
2. 24 hours after completion of all noise attenuation measures and commencement of drilling or rework activities, the applicant shall take a measurement at the ambient level at the property line of the identified, nearest sensitive receptor.
3. Every 14 days after commencement of activities, the applicant shall take a measurement at the ambient level at the property line of the identified, nearest sensitive receptor until completion of construction activities.
4. All installed noise attenuation measures shall be maintained throughout all construction phase activities.

7. Operations

a. Concurrent with the commencement of capture activities and injection of CO_2, agreements with the sensitive receptor property owners shall be completed for 24-hour noise

monitoring. An operational noise monitoring report shall include 7 days of 24-hour monitoring at the sensitive receptor property line during normal operations of the CCS project. If the noise standard is not achieved, then additional mitigation for operations is required to be submitted and implemented after review and approval by Kern County Planning and Natural Resources.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.13-2: Exposure of Persons to, or Generate, Excessive Ground-borne Vibration or Ground-borne Noise Levels

The dominant sources of man-made vibration are sonic booms, blasting, pile driving, pavement breaking, demolition, diesel locomotives, and rail-car coupling. None of these activities are anticipated to occur during the construction or operation of the proposed project. Typical vibration levels at distances of 100 feet and 300 feet are summarized in Table 4.13-8. As stated above, construction activities would occur at distance of 5 miles or more from any existing sensitive receptor locations. As such, construction-related vibration would not result in any impacts on sensitive receptors.

Table 4.13-8: Typical Vibration Levels During Construction

	Peak Particle Velocity (inches per second)	
Equipment	**At 100 feet**	**At 300 feet**
Bulldozer (Large)	0.011	0.006
Bulldozer (Small)	0.0004	0.00019
Loaded Truck	0.01	0.005
Jackhammer	0.005	0.002
Vibratory Roller	0.03	0.013
Caisson Drilling	0.01	0.006

Once project construction is complete, it is not expected that ongoing operational activities would result in any vibration impacts on sensitive uses. Therefore, the proposed project would not expose sensitive receptors to excessive ground-borne vibration or noise levels, and impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

Impact 4.13-3: For a Project Located Within the Vicinity of a Private Airstrip or an Airport Land Use Plan or, Where Such a Plan Has Not Been Adopted, Within Two Miles of a Public Airport or Public Use Airport, Would the Project Expose People Residing or Working in the Project Area to Excessive Noise Levels.

The project site is not located within 2 miles of a public airport or private airstrip. The closest airport to the project site is the Buttonwillow-Elk Hills Airport located approximately 14 miles southeast of the project site. No impacts would occur.

Mitigation Measures

No mitigation is required.

Level of Significance

No impact would occur.

4.13.5 Cumulative Setting, Impacts, and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present, and reasonably foreseeable future oil and gas development, including wells and abandonment activity to implement CCS projects, constitute cumulative impacts. Kern County has prepared an EIR that evaluated the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022, (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities, and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The aforementioned documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells per year Countywide of various types (for example, production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection, and gas disposal) (pages 3-37 and 3-38 of the SREIR 2020/2021) and an additional 5,066 other wells (such as, cyclic wells, Senate Bill [SB] 4 Activities, plugged and abandoned) per year (page 3-38 of the SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for eight years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. California Geologic Energy Management Division permitting for all wells with the exception of plugging and abandonments has never averaged over 2,000 permits a

year (as implementation in some years of the Kern County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts on noise receptors is considered the project site plus a 5-mile radius. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects*, would have on noise receptors. This geographic scope of analysis is appropriate because noise receptors within this area are expected to be similar to those in the project site because of their proximity and similar environments would result in similar land use—and thus, site types.

Impact 4.13-4: Contribute to Cumulative Noise Impacts

With regard to noise, the project has the potential to contribute significantly to cumulative impacts within the study area. A complete analysis of the cumulative impacts of the various noise-generating activities from oil and gas are provided in Section 4.12, *Noise* (Final Oil and Gas EIR 2015). Since oil and gas activities could occur anywhere in the project area, the combined noise levels from the proposed project and existing or reasonably foreseeable projects depend on the proximity of oil and gas activities to other noise sources at a specific location. Noise generated from the construction of wells authorized under the project, conservatively assuming the use of the largest exploratory deep drilling rig (Kenai Rig), could be in excess of 65 dBA CNEL up to 4,000 feet from a construction site. Therefore, significant noise impacts would occur if there were sensitive noise receptors within 4,000 feet of the construction of a well. Other projects with construction or operations occurring concurrently with the construction or operations of a well would also contribute to noise levels experienced by nearby sensitive noise receptors.

Other projects associated within the study area would also have to comply with the Kern County Noise Ordinance and/or the Noise Element of the KCGP and, therefore, would have to ensure noise levels do not exceed standards. MM 4.13-1 would be implemented for project activities if there are sensitive human noise receptors within 4,000 feet of a well to ensure that the noise levels do not exceed 65 dBA at the nearest exterior wall of the nearest sensitive receptor or more than 1 dBA higher than the ambient noise levels, if in excess of 65 dBA. Potentially significant cumulative noise impacts could occur even if noise levels associated project activities plus surrounding oil and gas activities are under 65 dBA, depending on the location of another nearby project, its noise levels, and the distance to a sensitive noise receptor.

Mitigation Measures

Implement MM 4.13-1 as described above.

Level of Significance after Mitigation

Cumulative impacts would be significant and unavoidable.

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Section 4.14

Population and Housing

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Section 4.14

Population and Housing

4.14.1 Introduction

This section of the Environmental Impact Report (EIR) describes the environmental setting and regulatory setting for population, employment, and housing. It also describes the impacts on population and housing that would result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers) southwest of the community of Lost Hills and west of State Route (SR) 33.

The information in this section is based on data from, but not limited to, the Kern Council of Governments (COG) and Kern COG 2022 Regional Transportation Plan (RTP), as well as the Kern County General Plan (KCGP) Housing Element (2015–2023), and demographic information from the California Department of Finance (DOF) and the U.S. Census Bureau.

A description of the environmental setting (affected environment) for population and housing is presented in Section 4.14.2, *Environmental Setting*, including discussion of the regional and local housing and employment trends. The regulatory setting applicable to population and housing is presented in Section 4.14.3, *Regulatory Setting* and Section 4.14.4, *Impacts and Mitigation Measures*, discusses project impacts and associated mitigation measures.

4.14.2 Environmental Setting

Regional Setting

Population

Kern County (County) is California's third largest county, encompassing 8,202 square miles. As of 2022, the county had a total population of 909,235 (Kern COG 2022). The California DOF estimated that the total county population between 2010 and 2022 increased 3.5 percent, while population in the unincorporated areas increased by an estimated 11.5 percent (DOF 2021, 2023). The 2022 Kern County RTP and Sustainable Communities Strategy (SCS) identifies future growth in the County as being driven by value-added agriculture, aerospace/defense, energy/natural resources, transportation logistics/manufacturing, and health care. Oil and renewable energy, such as wind and solar, primarily drove growth over the last decade. The Valley portion of the County produces over 75 percent of California's in-state oil and 58 percent of the state's total natural gas. Countywide, commercial-scale wind, solar, and distributed generation solar produce over 12,000 megawatts of electricity for use locally and throughout California. Value-added agriculture

supported by alternative fuel production, such as biodiesel, made the County the largest agricultural-producing county in the nation for the first time in 2016.

The Kern County RTP/SCS projects that the population growth will average about 10,500 people per year with 1,186,600 people by 2046. The previously adopted 2015 forecast for the 2018 RTP assumed that the population growth would average about 21,900 people per year from 2015 to 2042. The new adopted forecast for the 2022 RTP predicts a significant 51 percent reduction in population growth compared to the 2018 RTP assumptions. Out-migration has driven the slowdown in population growth, exceeding natural increase (births minus deaths). In 2020–21, the County experienced a negative growth year because of prison closures, early release of prisoners, and people leaving the state because of high housing costs and concerns over the pandemic. Still, out of 58 counties in California, the County remains the 11th-most populated and is ahead of San Francisco County but behind Fresno County.

Regional and Local Housing Trends

In 2010, the County had a total of 284,367 housing units; in 2022, there were 305,853 units (DOF 2021, 2023). Approximately 93.4 percent of the 305,853 units were occupied, and 19,950 (or 6.5 percent) of the units were vacant in 2022 (DOF 2023). According to the U.S. Census Bureau, between 2017 and 2021, 58.3 percent of the housing units were owner occupied (U.S. Census Bureau 2021). Housing units and occupancy/vacancy rate trends for 2020 through 2022 are reflected in Table 4.14-1.

Table 4.14-1: Kern County Housing Trends

Area	Unit Count			Occupancy/Vacancy Rate		
	2020	2022	Percent Change	Occupied 2020	Occupied 2022	% Change
Incorporated	186,612	193,032	3.44	174,135/6.7%	184,357/4.5%	5.87/-2.2%
Balance of the County	115,268	112,821	-2.12	100,344/12.9%	101,546/10.0%	1.19/-2.9%
TOTAL	**301,880**	**305,853**	**1.32**	**274,479/9.1%**	**285,903/6.6%**	**4.16/-2.5%**

Source: DOF 2021, 2023

Existing housing and projected housing in the region and vicinity (including incorporated cities), as reported by the Kern County RTP/SCS, are presented in Table 4.14-2 (households) and Table 4.14-3 (housing units and households incorporated cities and surrounding areas).

Table 4.14-2: Estimated and Projected Housing Trends within Incorporated and Unincorporated Regional Statistical Areas

Area	2010	2013	2023	Percent Change 2013-2023
Greater Arvin Area	4,596	5,036	6,503	29.1
Unincorporated Greater Arvin Area	368	721	803	11.4
Metro-Bakersfield	168,373	178,842	217,548	21.6
Unincorporated Metro-Bakersfield	57,241	65,555	87,348	33.2
Greater Delano/McFarland Area	13,712	14,327	16,239	13.4
Unincorporated Greater Delano/McFarland Area	853	1,285	1,239	-3.6
Greater Shafter Area	6,212	7,071	10,588	49.7
Unincorporated Greater Shafter Area	1,982	2,757	3,788	37.4
Greater Taft/Maricopa Area	6,189	6,578	7,863	19.5
Unincorporated Greater Taft/Maricopa Area	3,521	3,915	4,953	26.5
Greater Tehachapi Area	11,614	12,466	15,672	25.7
Unincorporated Greater Tehachapi Area	8,493	9,272	11,872	28.0
Greater Wasco Area	6,087	6,435	7,905	22.8
Unincorporated Greater Wasco Area	956	1,142	905	-20.8
TOTAL	**290,197**	**315,402**	**393,226**	**24.7**

Source: Kern COG 2014

Table 4.14-3: Estimated and Projected Housing Unit Trends within Incorporated Cities

	Housing Units				Households			
Area	2010	2013	2023	%Change 2013-2023	2010	2013	2023	% Change 2013-2023
City of Arvin	4,476	4,568	6,000	31.32%	4,228	4,315	5,700	32.1
City of Bakersfield	120,725	123,066	140,500	14.17%	111,132	113,287	130,200	14.9
Delano	10,713	10,831	12,500	15.41%	10,260	10,373	12,000	15.7
McFarland	2,683	2,755	3,100	12.52%	2,599	2,669	3,000	12.4
City of Shafter	4,521	4,612	7,200	56.11%	4,230	4,314	6,800	57.6
City of Taft	2,525	2,522	2,800	11.02%	2,254	2,251	2,500	11.1
City of Maricopa	466	464	500	7.76%	414	410	410	0.0
City of Wasco	5,477	5,649	7,400	31.00%	5,131	5,293	7,000	32.3
TOTAL	**151,586**	**154,468**	**180,000**	**16.53%**	**140,248**	**142,912**	**167,610**	**17.3**

Source: Kern COG 2014

Regional and Local Employment Trends

According to the California Employment Development Department, the County consistently ranks among the top five most-productive agricultural counties in the United States and is the 13th largest petroleum-producing county in the nation. Additionally, because of its unique geographic location, the County has also become a distribution location for some of the world's largest companies, with freight cargo going to and from the Ports of Los Angeles and Long Beach.

Between 2010 and 2022, the County's civilian labor force grew by 5.2 percent (372,200 and 391,700, respectively). The employed labor force grew by 16.1 percent between 2010 and 2022 (312,600 and 364,600, respectively) (State of California Employment Development Department 2021). The Kern Economic Development Corporation (KEDC) projects the fastest growing occupations within Kern County between 2018 and 2028 to be within the Education, Healthcare & Social Assistance industry and the Trade, Transportation and Utilities industry (KEDC 2023).

In 2022, the annual average number of individuals participating in the Kern County labor force was 387,500; of these, 360,500 were employed, leaving 27,000 actively looking for work, or an unemployment rate of 7 percent. Based on the KEDC 2023 Market Overview, industry employment in the County is projected to reach 382,900 by 2028, an increase of 9.4 percent over the 10-year period.

According to the Kern COG Regional Housing Data Report, there were 1.10 jobs per housing unit for incorporated areas of Kern County in 2010. That ratio increased to 1.18 in 2013 and was projected to decrease to 1.03 by 2023. Similarly, the ratio of jobs to housing units in unincorporated areas of Kern County was expected to decrease from 1.13 (2013) to 0.83 (2023) (Kern COG 2014).

4.14.3 Regulatory Setting

Federal

No federal laws, regulations, or policies are applicable to population and housing in relation to the proposed project.

State

California Housing Element Law

California state law requires each city and county to adopt a general plan for future growth containing at least seven mandatory elements, including Housing Element. The California Department of Housing and Community Development (HCD) plays the critical role of reviewing every local government's housing element to determine whether it complies with state law and submitting written findings back to each local government. HCD's approval is required before a local government can adopt its housing element as part of its overall General Plan. Jurisdictions can opt to update their housing elements every five years or every eight years. The option to use an 8-year schedule was created to better align with the schedule local governments (or COGs/Metropolitan Planning Organizations) have to meet to update their Regional Transportation Plans, which are updated every four years and are now mandated to align with housing plans in Regional Sustainable Communities Strategies. California's Housing Element Law acknowledges that, in order for the private market to adequately address the housing needs and demand of Californians, local governments must adopt plans and regulatory systems that provide opportunities for (and do not unduly constrain) housing development. As a result, housing policy in California rests largely on the effective implementation of local general plans and, in particular, local housing elements (HCD 2022).

Housing Element in general plans must identify housing needs for all economic segments. It also provides opportunities for housing development to meet their existing and projected housing needs, including their share of the regional housing need. At the state level, the HCD estimates the relative share of California's projected population growth that could occur in each county in the state based on DOF population projections and historic growth trends. Where there is a regional

COG, as in Kern County, the HCD provides the regional housing need to the COG. The COG then assigns a share of the regional housing need to each of its cities and counties. The process of assigning shares provides cities and counties the opportunity to comment on the proposed allocations. The HCD oversees the process to ensure that the COGs distribute their share of the state's projected housing need.

Before adopting an update to its Housing Element, the city or county must submit a draft to the HCD for review. The HCD advises the local jurisdiction as to whether its Housing Element complies with the provisions of California housing element law.

The COGs are required to assign regional housing shares to the cities and counties within their regions on a similar 5-year schedule. At the beginning of each cycle, the HCD provides population projections to the councils of governments, which then allocate shares to their cities and counties. The shares of the regional need are allocated before the end of the cycle so that the cities and counties can amend their housing elements by the deadline.

Regional

2022 Regional Transportation Plan/Sustainable Communities Strategy

On July 21, 2022, the Kern COG adopted the 2022 RTP/SCS for the Kern Region, including Chapter 4, the SCS, which implements Senate Bill 375, California's Sustainable Communities and Climate Protection Act. The SCS integrates transportation planning, greenhouse gas reductions from passenger vehicles and light-duty trucks, and regional housing needs with a forecasted development pattern that acknowledges Kern County's and the incorporated cities' General Plan programs.

The SCS acknowledges the importance of energy resources, including oil and gas production, as an important resource and industry to Kern County's economy and future growth.

Local

Kern County General Plan

The project site is located within the KCGP area and, therefore, would be subject to applicable policies and measures of the KCGP. The Land Use, Conservation, and Open Space Element and the Energy Element of the KCGP include goals, policies, and implementation measures related to population and housing. As the proposed project site is located on an existing oilfield far from an urbanized community, no policies related to population and housing apply to the proposed project. There are more general policies that do apply, no matter the specifics of the proposed project, as listed below.

1.10. General Provisions

Goals

Goal 1. Ensure that the County can accommodate anticipated future growth and development while maintaining a safe and healthful environment and a prosperous economy by preserving valuable natural resources, guiding development away from hazardous areas, and assuring the provision of adequate public services.

Policies

Policy 6. The County shall ensure the fair treatment of people of all races, cultures, incomes, and age groups with respect to the development, adoption, implementation, and enforcement of land use and environmental programs.

1.10.9. Economic Development

Policies

Policy 58. Support and work toward the elimination of disincentives for business and industry to prosper in Kern County and create special economic development programs to encourage commerce and industry to locate in Kern County.

Implementation Measures

Implementation Measure DD. Utilize the County's Economic Strategy and the Economic Incentive Program to promote economic growth and to maintain a strong local economy.

Chapter 5. Energy Element

5.3.2. Kern County's Economic Dependence on the Oil Marketplace

Goals

Goal. To reduce the County's susceptibility to fluctuations in the petroleum production levels, and to encourage diversification of the economy.

Policies

Policy 3. The County shall encourage the conversion of existing petroleum-related facilities to other productive uses when they are no longer needed or productive.

Policy 4. The County should encourage the development of renewable energy industries to diversify the energy economy in Kern County.

KCGP, Housing Element 2015-2023, Adopted April 26, 2016

The Housing Element is a separate element of the KCGP. Each city and county is required by California housing law to develop a Housing Element, one of the seven general plan elements, in

order to qualify for allocation of state regional housing funding. To receive regional housing funds, each city and county must update its general plan Housing Element on a regular basis (generally, every 5 years to 8 years). The housing element must incorporate policies and identify potential sites that would accommodate the city or county's share of the regional housing needs. The County adopted its current Housing Element (2024–2023) on April 26, 2016 (Kern County 2016). The Sixth Cycle Kern County Housing Element (2024–2031) is currently in public review with adoption required by April 2024 (Kern County 2023). Because the project would not include new housing, the goals and policies of the Housing Element do not apply to the proposed project.

4.14.4 Impacts and Mitigation Measures

This section describes the impact analysis relating to population and housing for the proposed project. It describes the methods used to determine the impacts of the project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion, where applicable,

Methodology

Population, housing, and employment in the area were evaluated by reviewing the most current data available from the U.S. Census Bureau, California DOF, KCGP, KEDC, and the Kern COG.

Thresholds of Significance

The County's California Environmental Quality Act (CEQA) Implementation Document and Environmental Checklist identify the following criteria, as established in Appendix G of CEQA Guidelines, to determine whether a project could potentially have a significant adverse effect on population and housing. A project could have a significant adverse effect on recreation if it would:

- Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).
- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Project Impacts

The types of potential impacts related to population and housing is generally the same for construction and operational activities, each of which requires a workforce of experienced employees. Accordingly, the impacts assessment applies to both project construction and operation.

Impact 4.14-1: Induce Substantial Population Growth in an Area, Either Directly or Indirectly

As described in Chapter 3, *Project Description*, construction of the project would require a maximum of approximately 300 workers daily during the peak construction. The presence of construction workers at the project site would be temporary, over the duration of the approximate three-year construction period. Construction workers would likely come from an existing local and/or regional construction labor force and would not likely relocate their households as a consequence of working on the project. If temporary construction worker housing should be necessary, it is expected that accommodations would be available in the nearby hotels. Therefore, the short-term increased employment of construction workers on the project site would not result in a notable increase in the residential population of the area surrounding the project site.

Operation of the project would require up to 10 full-time employees that would generate up to approximately 25 trips per day. Given the scope of the existing population and available housing in the area, a potential increase in population this minimal is not considered significant. Moreover, some, if not all, of these future employees would already reside in the project area. Consequently, construction and operation of the project would not create a significant number of jobs or directly induce: (1) substantial population growth; or (2) the development of any new housing, businesses, or new infrastructure during construction or operation.

Construction and operation of the proposed project would not result in a significant increase or the availability of new jobs. In addition, the project does not propose the extension of roads or the development of other infrastructures, such as utilities that would directly or indirectly induce population growth. Therefore, this impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

Impact 4.14-2: Displace Substantial Numbers of Existing Housing or People, Necessitating the Construction of Replacement Housing Elsewhere

As described in Section 4.15.2, *Environmental Setting*, the surrounding area is composed of agricultural fields, both active and fallow, and other existing oilfields. The closest urbanized area to the project site is located approximately 7 miles southwest within the community of Lost Hills. The project would not require the removal or displacement of any residential structures or inhabitants; therefore, no housing would be displaced, and the project would not require construction of replacement housing elsewhere. No impact would occur.

Mitigation Measures

No mitigation measures are required.

Level of Significance

No impact would occur.

4.14.5 Cumulative Setting Impacts and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project, together with the impacts of past, present, and reasonably foreseeable future oil and gas development, including wells and abandonment activity to implement carbon capture and storage projects, constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells countywide per year of various types (production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 other wells (cyclic wells, SB 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for 8 years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. California Geologic Energy Management Division permitting for all wells with the exception of plugging and abandonments has never averaged over 2,000 permits a year (as implementation in some years of the County permits) since 2019. The analysis in the previous EIR documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts to population and housing is the County. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects*, within this geographic scope may have on population and housing in conjunction with the proposed project. This geographic scope of analysis is appropriate because population and housing in the County is expected to be similar to those in the project site because of their proximity.

Impact 4.14-4: Contribute to Cumulative Population and Housing Impacts

With regard to population and housing impacts, the project does not have the potential to contribute significantly to cumulative impacts within the County. A complete analysis of the cumulative impacts relative to population and housing from oil and gas activities are provided in Section 4.12, *Population and Housing,* of the Oil and Gas EIR.

In addition, the County is expected to continue to grow, with or without the proposed project, consistent with the growth projections included in the 2022 Kern COG RTP/SCS and accompanying EIR.

The proposed project would not be expected to result in any substantial increases in population or housing demand or require the displacement of substantial residences or people and construction of relocated housing. Accordingly, less than significant impacts would occur with the addition of the project in a cumulative setting. Displacement of and demand for housing and changes in the local labor market and population would not contribute to cumulatively considerable impacts.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Cumulative impacts would be less than significant.

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Section 4.15

Public Services

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Section 4.15

Public Services

4.15.1 Introduction

This section of the Environmental Impact Report (EIR) describes the affected environment and regulatory setting for public services, which includes fire protection, law enforcement services, schools, emergency medical services, and community health centers. It also describes the impacts to public services that would result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers) southwest of the community of Lost Hills and west of State Route (SR) 33.

A description of the environmental setting (affected environment) for public services is presented in Section 4.15.2, *Environmental Setting*, including discussion of the public service providers and facilities. The regulatory setting applicable to public services is presented in Section 4.15.3, *Regulatory Setting*. Section 4.15.4, *Impacts and Mitigation Measures*, includes a discussion of project impacts and associated mitigation measures, if necessary.

For impacts to parks and other recreational facilities, please refer to Section 4.16, *Recreation*.

4.15.2 Environmental Setting

Kern County is geographically California's third largest county, encompassing 8,202 square miles at the southern end of the Central Valley. The project area is bounded by Kings and Tulare Counties to the north, Santa Barbara and San Luis Obispo Counties to the west, the Tehachapi Mountains and the Sierra Nevada Mountains to east, and the northern boundary of the Los Padres National Forest to the south.

Fire Protection

Local

Fire protection in Kern County is a cooperative effort. The Kern County Fire Department (KCFD) provides firefighting services to many cities throughout the County. In addition, operating agreements with the U.S. Forest Service, U.S. Department of the Interior, Bureau of Land Management, U.S. Fish and Wildlife Service, and the California Department of Forestry and Fire Protection (CAL FIRE) provide wildland fire protection.

According to the KCFD's 2021 Strategic Fire Plan, the project site is within the Western Kern Fuel Management Area (Battalion 2) (KCFD 2022). The KCFD, and the following authorities, are

responsible for firefighting in this Fire Management Area: Bureau of Land Management, Department of Defense, U.S. Fish and Wildlife Service, and the local KCFD.

The KCFD provides fire protection services for the 8,000 square miles of unincorporated areas of Kern County and the cities of Arvin, Delano, Maricopa, McFarland, Ridgecrest, Shafter, Taft, Tehachapi, and Wasco. KCFD has 47 full-time fire stations and one seasonal station. KCFD is broken into seven battalions for operational management; each battalion covers a large geographical area and includes seven to nine fire stations. In total, KCFD provides fire protection services for citizens living in the cities of Arvin, Delano, Maricopa, McFarland, Ridgecrest, Shafter, Taft, Tehachapi, and Wasco, as well as 500,000 citizens living in unincorporated areas of Kern County. As of 2023, there are seven battalions, 47 fire stations, 58 engines, six ladder trucks, 54 patrols, 30 command vehicles, two hand crews, two helicopters, three hazardous materials response teams, two technical rescue teams, and one oil fire foam tender (KCFD 2023a). KCFD has 14 Mutual Aid Agreements with neighboring fire suppression organizations to further strengthen the emergency services available to residents. The project site is served by Kern County Fire Station Number 26 (Lost Hills).

The Emergency Communications Center for KCFD is in the Whiting Communications Center in Northeast Bakersfield (KCFD 2023b). The Emergency Communications Center is responsible for dispatching resources over an area of more than 8,000 square miles that includes 65 fire stations.

State/Pipeline Safety Division at the Office of State Fire Marshal

The Pipeline Safety Division at the Office of State Fire Marshal (OSFM) regulates the supercritical and hazardous liquid pipelines pursuant to 49 Code of Federal Regulations (CRF) Part 195 and the California Elder Pipeline Safety Act of 1981, as amended in 2022. Specifically, the OSFM is an agent to enforce the 49 CFR part 195 regulation on *intrastate* hazardous liquid pipelines. According to Part 195.2, carbon dioxide (CO_2) means a fluid consisting of more than 90 percent CO_2 molecules compressed to a supercritical state. Hence, the OSFM only regulates CO_2 pipelines with a concentration of more than 90 percent of CO_2 compressed to a supercritical state under the federal program. Currently, the OSFM does not regulate pipelines transporting CO_2 as a gas or liquid under the federal program.

Law Enforcement Protection

California Highway Patrol

The California Highway Patrol (CHP) performs the following services:

- Enforces traffic regulations
- Oversees response to emergency incidents on California's highways (or assists other public agencies responding to emergency incidents)
- Promotes the safe and efficient movement of people and goods on California highways to minimize loss of life, injuries, and property damage

CHP officers patrol state highways and implement the CHP's other law enforcement activities (for example, drug interception, vehicle theft investigation and prevention, vehicle inspections, accident investigations, and public awareness campaigns), with the support of the non-uniformed personnel assigned to area and division offices.

The CHP has eight divisions that provide services throughout California. Kern County is in both the Central and Inland Division service areas (CHP 2023a). The CHP has two offices in the vicinity of the project site, which are part of the CHP's Central Division, including one in Bakersfield and one in Buttonwillow (see Table 4.15-1). The Central Division includes the San Joaquin Valley and extends south into the Grapevine, a portion of Interstate 5 that climbs out of the San Joaquin Valley and into the Los Angeles Basin (CHP 2023b).

Table 4.15-1: California Highway Patrol Area Offices in the Vicinity of the Project Site

CHP Office Number	Name	Address
(426)	Buttonwillow	29449 Stockdale Highway Bakersfield, CA 93314
(420)	Bakersfield	9855 Compagnoni Street Bakersfield, CA 93313

Source: CHP 2023a
Key:
CHP = California Highway Patrol

Kern County Sheriff's Office

The Kern County Sherriff provides police protection services to the unincorporated portions of the County. The Kern County Sheriff is the County's chief law enforcement officer. The Kern County Sheriff's Office has 1,202 sworn and civilian employees. There are 567 authorized deputy sheriff positions deployed in patrol, substation, detective, courts services, and special investigations units (KCSO 2023a). The Kern County Sheriff's Office provides protection for the unincorporated areas of Kern County and has a contract arrangement with some incorporated areas. The Kern County Sherriff's headquarters is in Bakersfield and consists of 15 substations that provide patrol services to remote areas of Kern County, such as the desert and mountainous regions, as well as other areas that need law enforcement services. The Buttonwillow substation is the closest to the project site.

The average response times for the Kern County Sheriff's Office are 7 minutes 24 seconds for emergency in-progress calls (for example, a crime that is under way and/or a life-or-death situation), 14 minutes 25 seconds for non-emergency in-progress calls (for example, a crime that has already occurred and/or an incident that is not life-threatening), and 28 minutes 23 seconds for report calls (reporting a crime that is not in progress) (Pruitt 2014).

The Metro Patrol Division of the Kern County Sheriff's Office has eight sergeants, 67 deputies, seven senior deputies, and eight civilian support staff. The Kern County Sheriff's Office Metro Patrol Division covers four zones within the city of Bakersfield. The four zones cover 600 square miles, but this area does not include the outlying areas where the substations provide services

(KCSO 2023b). The Rural Crimes Investigation Unit addresses property crimes in the agricultural, ranch, and oilfield portions of the County.

Schools

The County is served by 46 K-12 school districts (KCSS n.d.[a]). The project site is within the McKittrick Elementary and Taft Union High school district boundaries (KCSS n.d. [b]). In addition to Kern County's K-12 school districts, the County includes several private schools, as well as home or independent study programs. Colleges in Kern County include Bakersfield College, California State University, Bakersfield, Taft College, and Cerro Coso Community College. The project site is not within the vicinity of any colleges.

The closest schools to the project site are Lost Hills Elementary School, A. M. Thomas Middle School, Wonderful College Prep Academy - Lost Hills, and Mc Kittrick Elementary School. These schools are located within 10 miles of the project site, and specific distances to each project element are listed in Table 4.15-2.

Table 4.15-2: Schools in the Vicinity of the Project Site

School Name	Student Population (2022-2023)	District	Distance to CUP Boundary (miles)	Distance to Closest Injection Well (miles)	Distance to Closest Facility Pipeline (miles)
Lost Hills Elementary School	180	Lost Hills Union Elementary	6.43	7.09	7.02
A.M. Thomas Middle School	82	Lost Hills Union Elementary	6.49	7.15	7.08
Wonderful College Prep Academy - Lost Hills	504	Kern County Office of Education	7.12	7.68	7.54
McKittrick Elementary School	79	McKittrick Elementary	8.68	17.30	11.41
Buttonwillow Elementary School	313	Buttonwillow Union Elementary	11.58	19.11	14.01

Key: CUP = Conditional Use Permit

Parks

Please see information regarding park and recreation facilities in Section 4.15, *Recreation*.

Other Public Facilities

There are over 60 community health centers, health clinics, ambulatory surgical centers, and hospitals within the region. Below is a list of hospitals in the region that have emergency rooms:

- Bakersfield Heart Hospital, Bakersfield
- Bakersfield Memorial Hospital, Bakersfield
- Delano Regional Medical Center, Delano
- Kern Medical Center, Bakersfield
- Mercy Hospital, Bakersfield
- Mercy Southwest Hospital, Bakersfield
- Ridgecrest Regional Hospital, Ridgecrest
- San Joaquin Community Hospital, Bakersfield

The Kern Medical Center also has a trauma center. A Community Health Needs Assessment was prepared for Kern County in 2019 (Healthy Community Institute and Strategy Solutions 2019) through a collaborative effort of the Kern County Community Benefit Collaborative, and is comprised of Delano Regional Medical Center, Dignity Health (Mercy and Memorial Hospitals), Kaiser Permanente, and San Joaquin Community Hospital. The Community Health Needs Assessment was conducted to identify primary health issues, status, and needs, and enable providers to establish priorities, development interventions, and to direct resources to improve the health of Kern County residents. The closest health care facility to the project site is Omni Family Health, located at 21138 Paso Robles Highway, Lost Hills, CA 93249, approximately 7 miles away.

The Kern County Emergency Medical Services (EMS) Department is the lead agency for the EMS system in Kern County. EMS is responsible for coordinating all system participants, which include the public, emergency service providers, and hospitals throughout the County. The department provides training programs for EMS, such as certification and recertification for local EMS personnel. It includes communications services, including EMS dispatch. Transportation services include ambulance service monitoring and system compliance, service areas and performance standards, and status of EMS transportation systems. The County has been divided into nine geographic regions. Each region, or Exclusive Operating Area or Operating Area, has been assigned to one ambulance provider. The project site is located within the Operating Area 9, which covers Taft, Maricopa, McKittrick, and surrounding unincorporating areas (CEMSA 2019).

Other public services include over 25 federal post offices and city and County libraries. The County library system is divided into two districts: Greater Bakersfield Area and Outside Bakersfield Area.

Greater Bakersfield Area has seven branch libraries, plus a bookmobile and the Olive Drive Fire Research Center. Outside Bakersfield Area has 13 branches, plus a bookmobile.

The closest post office is located at 21155 CA-46, Lost Hills, approximately 7 miles east of the northern portion of the project site. The Buttonwillow Library is the closest library, located at 101 N Main Street in Buttonwillow, approximately 13 miles northeast of the western portion of the project site.

4.15.3 Regulatory Setting

Federal

No federal regulations, plans, or public service standards applicable to the project have been identified.

State

The California Department of Forestry and Fire Protection

Under Title 14 of the Natural Resources of the California Code of Regulations (CCR), CAL FIRE has the primary responsibility for implementing fire wildlife planning and protection for State Responsibility Area (SRA) lands. CAL FIRE develops fire safe regulations and issues fire safe clearances for land within a fire district of SRA. More than 31 million acres of California's privately owned wildlands are under the jurisdiction of CAL FIRE through the CAL FIRE Resource Management Program. CAL FIRE provides emergency services in 36 of the State's 58 counties via contracts with local governments (CAL FIRE 2022).

In addition to wildland fires, CAL FIRE's planning efforts involve responding to other types of emergencies that may occur daily, including residential or commercial structure fires, automobile accidents, heart attacks, drowning victims, lost hikers, hazardous material spills on highways, train wrecks, floods, and earthquakes.

Under CCR, Title 24, Regulations Development, the Office of the State Fire Marshal is responsible for promulgating regulations that promote fire and life safety for inclusion into the State Building Codes, including the California Building Code, California Fire Code, California Electrical Code, California Mechanical Code, California Plumbing Code, and California Historical Building Code. These documents are also referred to as CCR, Title 24. The process incorporates a great deal of public participation and is guided by the State Building Standards Law.

California Occupational Safety and Health Administration

In accordance with CCR, Title 8, Sections 1270, Fire Prevention, and 6773, Fire Protection and Fire Equipment, the California Occupational Safety and Health Administration has established minimum standards for fire suppression and EMS. The standards include guidelines on the handling of highly combustible materials; fire hosing sizing requirements; restrictions on the use of

compressed air; access roads; and the testing, maintenance, and use of firefighting and emergency medical equipment.

Local

Kern County General Plan

The project is located within the Kern County General Plan (KCGP) (Kern County 2009) area; therefore, it would be subject to applicable policies and measures of the KCGP. The Land Use, Conservation, and Open Space Element and the Safety Element of the KCGP include goals, policies, and implementation measures related to public safety that apply to the project, as described below.

Chapter 1. Land Use, Conservation, and Open Space Element

1.4. Public Facilities and Services

Goals

Goal 1. Kern County residents and businesses should receive adequate and cost-effective public services and facilities. The County will compare new urban development proposals and land use changes to the required public services and facilities needed for the project.

1.4.1. Public Facilities and Services

Policies

Policy 1. New discretionary development will be required to pay its proportional share of the local costs of infrastructure improvements required to service such development.

Policy 3. Individual projects will provide availability of public utility service as per approved guidelines of the serving utility.

Policy 6. The County will ensure adequate fire protection to all Kern County residents.

Policy 7. The County will ensure adequate police protection to all Kern County residents.

Implementation Measures

Implementation Measure A. Continue to administer the Capital Improvement Program (CIP) and coordinate with public utility providers listing the necessary improvements to Kern County's public services and facilities in collaboration with key service providing agencies and the County Administrative Office as a first step toward the preparation of a long-term Public Services Plan for Kern County. This plan addresses the projected demand for public services throughout the County in comparison with projected revenues and identifies long-term financial trends for the major public service providers. The CIP and General Plan can assure compliance with the provisions of Government Code Sections 65401 and 65402 which require review of all capital facility decisions for consistency with this General Plan.

Implementation Measure B. Determine local costs of County facility and infrastructure improvements and expansion which are necessitated by new development of any type and prepare a schedule of charges to be levied on the developer at the site of approval of the Final Map. This implementation can be effectuated by the formation of a County work group.

Implementation Measure J. Ensure that the Superintendent of Schools and the respective school districts are informed of development proposals and are afforded the opportunity of evaluating their potential effect on the physical capacity of school facilities.

Implementation Measure L. Prior to the approval of development projects, the County shall determine the need for fire protection services. New development in the County shall not be approved unless adequate fire protection facilities and resources can be provided.

1.10. General Provisions

Goals

Goal 1. Ensure that the County can accommodate anticipated future growth and development while maintaining a safe and healthful environment and a prosperous economy by preserving valuable natural resources, guiding development away from hazardous areas, and assuring the provision of adequate public services.

1.10.1. Public Services and Facilities

Policies

Policy 9. New development should pay its pro rata share of the local cost of expansions in services, facilities, and infrastructure which it generates and upon which it is dependent.

Policy 15. Prior to approval of any discretionary permit, the County shall make the finding, based on information provided by the California Environmental Quality Act documents, staff analysis, and the applicant, that adequate public or private services and resources are available to serve the proposed development.

Policy 16. The developer shall assume full responsibility for costs incurred in service extensions or improvements that are required to serve the Project. Cost sharing or other forms of recovery shall be available when the service extensions or improvements have a specific quantifiable regional significance.

Chapter 4. Safety Element

4.6. Wildland and Urban Fire

Policies

Policy 1. Require discretionary projects to assess impacts on emergency services and facilities.

Policy 3. The County will encourage the promotion of fire prevention methods to reduce service protection costs and costs to taxpayers.

Policy 4. Ensure that new development of properties have sufficient access for emergency vehicles and for the evacuation of residents.

Policy 6. All discretionary projects shall comply with the adopted Fire Code and the requirements of the Fire Department.

Implementation Measures

Implementation Measure A. Require that all development comply with the requirements of the KCFD or other appropriate agency regarding access, fire flows, and fire protection facilities.

Kern County Fire Code

Kern County has adopted, by reference, portions of the California Building Standards Code and the Uniform Fire Code, with modifications and amendments, in Chapter 17.32 of the Kern County Code of Building Regulations (Fire Code). The purpose of this code is to prescribe the minimum requirements necessary to establish a reasonable level of fire safety to protect life and property from hazards created by fire, explosions, and dangerous conditions.

The Kern County Fire Code defines a hazardous fire area as any land that is covered with grass, grain, brush, or forest, and situated in an inaccessible location so that a fire originating upon such land would present an abnormally difficult job of suppression, and would result in great and unusual damage through fire or the resulting erosion.

Kern County Fire Department Strategic Fire Plan

The KCFD's 2021 Strategic Fire Plan was developed collaboratively between federal, state, city, and County agencies to identify and prioritize pre-fire and post-fire management strategies and tactics meant to reduce the loss of values at risk within the department. The plan is designed to be an assessment and planning tool only. It is the responsibility of those implementing the projects to ensure that all environmental compliance and permitting processes are met as necessary (KCFD 2022).

Kern County Fire Department Wildland Fire Management Plan

The KCFD Wildland Fire Management Plan adopted in 2009 assesses the wildland fire situation throughout the SRA within the County. The Plan includes stakeholder contributions and priorities, and identifies strategic targets for pre-fire solutions, as defined by the people who live and work within the local fire problem. The plan systematically assesses the existing levels of wildland protection services, and identifies high-risk and high-value areas, which are potential locations for costly and damaging wildfires. The plan also ranks the areas in terms of priority needs (KCFD 2009).

Kern County Multi-Jurisdiction Hazard Mitigation Plan

The purpose of the multi-hazard mitigation plan is to reduce or eliminate the long-term risk to people and property from natural hazards and their effects in the County. The 2019–20 Update to the Kern County Multi-Jurisdiction Hazard Mitigation Plan is to help Kern County become less vulnerable to losses from future disasters (KCFD 2020). The multi-jurisdictional plan includes the County and the incorporated municipalities of Arvin, Bakersfield, California City, Delano, Maricopa, Ridgecrest, Shafter, Taft, Tehachapi, and Wasco. The County also encompasses areas of land controlled by federal and State land management agencies, including CAL FIRE, Bureau of Land Management, and Bureau of Reclamation. While other levels of government have jurisdiction in these parts of the County, the Hazard Mitigation Plan could also be used to document and coordinate mitigation efforts among federal, State, and local jurisdictions. This plan also covers 49 special districts that include school, airport, community service, water, recreation and park, sanitation, and other districts. Among the items assessed, the plan evaluated the risks associated with seismic events, dam failure, severe weather, and wildfire on oil and gas facilities (KCFD 2020).

Capital Projects and Major Maintenance

The General Services Division annually distributes a major maintenance and capital project submission and processing timeline. The timeline is accompanied by a list of projects previously requested by departments. The departments are required to (1) delete any projects no longer deemed necessary, (2) add any new project request, (3) indicate if a project is being revised, and (4) establish the department's prioritization of the projects. The General Services Division performs an initial screening of all projects to establish a preliminary priority. For those projects that are given preliminary priority, as well as for revised projects, cost estimates are then generated. The list of prioritized projects is provided to the County Administrative Office for budgetary consideration. The Fiscal Year (FY) 2021–2022 Recommended Budget included $26.4 million as part of the American Rescue Plan. No additional projects are included in the FY 2022–2023 Recommended Budget (KCCAO 2022).

Each year the County assesses the need for capital improvements in accordance with the County's capital policy. This policy provides guidance for the County's approach to planning of capital projects. The projects identified in this process include improvements to, or acquisition of, land and facilities. Certain recurring capital or infrastructure projects, such as roads, bridges, and sewer, are reviewed separately and budgeted in the applicable operating fund (roads or sanitation districts). The General Fund Major Maintenance budget unit enables the County to capitalize major maintenance projects that meet the capitalization requirements per accounting rules, which are considered routine maintenance, but require capitalization, and are funded through the originating departmental operating budget, or through an allocation of Net General Fund.

To the extent possible, and under current policy, the County uses one-time funding or fund balance to fund one-time expenses, such as capital projects, in order to mitigate impacts to operations. The amount of discretionary General Fund resources for capital projects varies annually based on available one-time funding. As a result of limited resources, the County has prioritized major

maintenance or capital improvements of existing structures and improvements over new capital projects.

4.15.4 Impacts and Mitigation Measures

Methodology

The methodology used to evaluate potential public services impacts includes the following: (1) evaluation of existing fire and police services and personnel for the fire and law enforcement stations serving the project site; (2) determination of whether the existing fire and law enforcement services and personnel are capable of servicing the project, in addition to the existing population and building stock; and (3) determining whether the project's contribution to the future service population would cause fire or police station(s) to operate beyond service capacity. The determination of the significance of the project on public services considers the ability of the service providers to provide and maintain acceptable levels of service, which in turn would require the construction of new or expansion of existing facilities. The methodology for this analysis included a review of published information pertaining to KCFD and Kern County Sherrif's Office (KCSO).

Thresholds of Significance

The Kern County California Environmental Quality Act (CEQA) Implementation Document and Kern County Environmental Checklist identify the following criteria, as established in Appendix G of the CEQA Guidelines, to determine if a project could potentially have a significant adverse effect on public services.

A project could have a significant adverse effect on public services if it would:

a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:
    i. Fire Protection
    ii. Police Protection
    iii. Schools
    iv. Parks
    v. Other Public Facilities

Project Impacts

Impact 4.15-1: The project would result in the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection services or police protection services.

Fire Protection

Construction and Decommissioning Impacts

An average daily construction workforce would vary depending on the type of activities underway. A maximum of approximately 300 workers daily during the peak construction period would be required. The presence of the construction workers would be temporary and anticipated to last approximately 36 months for the project construction period.

According to the CAL FIRE Fire Hazard Severity Zone (FHSZ) maps for Kern County, the project site is classified as an SRA (CAL FIRE 2024). The project site is not within a Federal Responsibility Area or Local Responsibility Area. According to the 2024 CAL FIRE, SRA FHSZ map, the project site is classified as SRA moderate and high fire risk. However, the project is not anticipated to physically impede the existing emergency response plans, emergency vehicle access, or personnel access to the site. The site is in a rural area with limited population, primarily developed with oil and gas production facilities and agricultural land. The project would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires (refer to Section 4.20, *Wildfire*).

Fire protection requirements are based on the number of residents and workers in the KCFD service areas. As the number of residents and workers increases, so does the number of emergency medical calls. Therefore, service demand is primarily tied to population, not building size, because emergency medical calls typically make up most responses provided by the Fire Department. The project does not include any residential uses. Construction workers are expected to travel to the project site from population centers such as Bakersfield, and the number of workers expected to relocate to the surrounding area is not expected to be substantial. If temporary housing should be necessary, it is expected that accommodations would be available in nearby communities, such as Buttonwillow and Lost Hills. Therefore, no residents would occupy the project site and an increase in service demands as a result of an increase in residential uses would not occur.

The addition of construction personnel on the project site could result in an increase in demand for fire protection services. While this would be an increase above existing levels, the presence of construction workers on the site would be temporary, as the construction period for the project is anticipated to last approximately 36 months. Although construction would be temporary and short term, fire hazards from the project would potentially increase the need for fire response or emergency services during the construction period. However, as required by Mitigation Measure

(MM) 4.9-18 (see Section 4.9, *Hazards and Hazardous Materials*), the project proponent would prepare and implement an emergency response plan that would contain notification procedures and emergency fire precautions consistent with the 2022 California Fire Code and Kern County Fire Code. The plan would be for use during the construction period and would include emergency fire precautions for vehicles and equipment, as well as implementing fire rules and trainings so temporary employees are equipped to support handling fire threats. Given the temporary nature of the project's construction and decommissioning, no substantial increase in fire protection services and/or facilities would occur during project construction. No new or physically altered KCFD or CAL FIRE facilities would be required to accommodate the proposed project during construction; therefore, construction-related impacts would be less than significant.

Operation

The project site would be properly operated, maintained, and inspected in accordance with the applicable regulatory requirements as detailed in Section 4.15.3, *Regulatory Setting,* above. These regulations specify the types and frequencies of safety inspections and maintenance to be performed. Furthermore, the project would be required to comply with its emergency response plan, as described in MM 4.9-18. The project would include 10 full-time employees which will operate the facility seven days a week, 24 hours a day. The project site would be monitored 24 hours a day, seven days a week, 365 days a year by an automated monitoring and infrared monitoring system for the underground facility pipeline, including automatic shutdown for potential leak scenarios. The monitoring and leak detection system is described in detail in Chapter 3, *Project Description*.

Although unlikely, operational activities could introduce fire risks to the project site through the use of mechanical equipment, electrical facilities, generators, or other equipment. However, all carbon capture and storage (CCS) operational activities would be required to comply with the emergency response plan implemented per MM 4.9-18, which would help reduce fire risks on site. In addition, all project facilities would have been designed and constructed in accordance with the current California Fire Code and Kern County Fire Code such that fire hazards are reduced and/or avoided. Combustible vegetation on and around the proposed facilities would be actively managed by the project owner during both the construction and operation phases to minimize fire risk. Combustible products would be either limited in height or removed primarily through a combination of dirt or gravel firebreaks, grazing, and mowing. Furthermore, a Vegetation Management Plan would be implemented during operations to guide the use of tools such as grazing and mowing to help manage accumulation of potential fine fuels around project infrastructure. The proposed project would include fire breaks around the site boundary in the form of compacted dirt or gravel breaks and access driveways subject to Kern County standards.

No new or physically altered KCFD or CAL FIRE facilities would be required to accommodate the proposed project. However, the project could increase demand for fire protection services in the future; thereby necessitating additional staff or construction of new facilities; therefore, impacts would be potentially significant, and MM 4.15-1 through MM 4.15-5 would be required.

Law Enforcement Protection

Construction and Decommissioning

As described above in Section 4.15.2, *Environmental Setting*, the KCSO provides primary law enforcement protection services for the project site and surrounding areas. The nearest KCSO substation that would serve the project site is the North Area Substation located at 181 East First Street, which is approximately 13 miles southeast of the project site. Similar to fire protection services, the need for police protection services would potentially increase during construction of the proposed project.

The project site is in a relatively remote location surrounded by undeveloped land and agricultural uses. Due to the nature of the project, it is considered unlikely to attract vandals or present other security risks that would make project facilities susceptible to crime and a substantial increase for law enforcement services is not expected.

Construction and decommissioning activities may slightly increase traffic volumes along SR 33 during the 36-month construction period. The added traffic associated with workers commuting to the project site, haul routes, deliveries, and other project-related traffic would be temporary; therefore, would not have a significant adverse effect on the law enforcement protective service provision or CHP's ability to patrol the highways or be needed to maintain service. Furthermore, the project would be required to implement a construction traffic control plan as detailed in MM 4.17-1 (see Section 4.17, *Traffic and Transportation*). Since no new or physically altered law enforcement facilities would be required to accommodate the proposed project, construction-related impacts would be less than significant.

Operation

As described above, the project site is located in a relatively remote rural area, and although located near SR 33, is sparsely populated. The surrounding areas are dominated by oil and gas exploration and production and agricultural lands and is thus unlikely to attract vandals or present other security risks that would make project facilities susceptible to crime. The entrance to the project site is gated, with security, and located at the private Oasis Road along Seventh Standard Road west of SR 33. The main entrance is only available for construction, operational, and emergency vehicle access. The project components would be fenced as needed for safety and security.

The main entrance is only available for construction, operational, and emergency vehicle access. There are minimal structures designated for site security (gates, fences, etc.) throughout the project site. However, the project site is heavily surveilled and occupied by personnel. The project site holds 24/7 operations and would always have facility personnel occupying and monitoring the project site.

The KCSO would respond from patrols originating from the existing substations, and officers/deputies that already patrol the site and surrounding areas. Therefore, no new or physically altered law enforcement facilities would be required to serve the proposed project.

The additional volume of vehicles associated with workers commuting to the project site during operations and routine maintenance would be minor and is not expected to adversely affect traffic (see Section 4.17, *Transportation and Traffic*). Therefore, impacts to the CHP patrol are not anticipated. The project would not result in the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for law enforcement services.

No new or physically altered law enforcement facilities would be required to accommodate the proposed project. However, the project could increase demand for law enforcement protection services in the future; thereby necessitating additional staff or construction of new facilities; therefore, impacts would be potentially significant, and MM 4.15-1 through MM 4.15-5 would be required.

Schools, Parks, and Other Public Facilities

Construction and Decommissioning Impacts

As described above, the project would require a maximum of approximately 300 workers during the peak construction period. The presence of construction workers at the project site would be temporary, over the duration of the approximate 36-month construction period. These workers would likely come from an existing local and/or regional construction labor force and would not likely relocate their households as a consequence of working on the project. If temporary housing should be necessary, it is expected that accommodations would be available in the nearby hotels. Therefore, the short-term increased employment of construction workers on the project site would not result in a notable increase in the residential population of the area surrounding the project site.

Accordingly, there would not be a corresponding demand or use of the local schools, parks, or public facilities. Therefore, project construction workers would not increase demand for local schools, parks, or public facilities such that substantial physical deterioration of such facilities would occur, nor would project construction require the construction or expansion of recreational facilities which might have an adverse effect on the environment, nor result in substantial adverse physical impacts associated with the construction of new or physically altered facilities in order to maintain acceptable service ratios. Therefore, impacts during construction would be less than significant.

Operation

Upon completion of all construction activities, the project proponent would ensure that the facility would be properly operated and maintained. The project proponent would develop an operations and maintenance protocol to be implemented throughout the life of the project. Once completed, the project will include 10 full-time employees which will operate the facility seven days a week, 24 hours a day.

These employees would likely come from an existing local and/or regional labor force and would not likely relocate their households as a consequence of working on the project. Even if the

maintenance employees were hired from out of the area and had to relocate to northwestern Kern County, the resulting addition of potential families to this area would not result in a substantial increase in the number of users at local schools. Therefore, staff required during operation would not increase demand for local schools, parks, or public facilities such that substantial physical deterioration of such facilities would occur, nor would project construction require the construction or expansion of recreational facilities which might have an adverse effect on the environment. Substantial adverse physical impacts associated with the construction of new or physically altered facilities in order to maintain acceptable service ratios would not occur with project implementation.

No new or physically altered park, school or community facilities would be required to accommodate the proposed project as the construction jobs would be drawn from local areas and employment is limited to 10 jobs.

The potential fiscal impacts on County services require mitigation to ensure one-time sales tax is collected for the benefit of the unincorporated area of Kern County, jobs are drawn from local areas, and fire services provide the training and equipment needed at no additional cost to the County. The unique nature of the project, which will require monitoring for 50 years after injection ends, requires mitigation beyond any bonding required by the U.S. Environmental Protection Agency (EPA). That bonding is specifically for the EPA requirements and would not be available to cover County services, consultation, or response. MM 4.15-3 and MM 4.15-5 will provide a Cumulative Impact Oil and Gas Reservoir Pore Space Charge (CIC-ORPS) to cover public services and provide an annual payment for the 50-year monitoring period after injection ends. MM 4.15-1 through MM 4.15-5 provides further finance assurances and implements County policy.

Mitigation Measures

MM 4.15-1 The project proponent/operator shall work with Kern County to determine how the use of sales and use taxes from construction of the project can be maximized. This process shall include, but is not necessarily limited to, the project proponent/operator obtaining a street address within the unincorporated portion of Kern County for acquisition, purchasing and billing purposes, and registering this address with the State Board of Equalization. As an alternative to the aforementioned process, the project proponent/operator may make arrangements with Kern County for a guaranteed single payment that is equivalent to the number of sales and use taxes that would have otherwise been received (less any sales and use taxes actually paid); with the amount of the single payment to be determined via a formula approved by Kern County. The project proponent/operator shall allow Kern County to use this sales tax information publicly for reporting purposes.

MM 4.15-2 Prior to the issuance of any building permits on the project, the project operator shall submit a letter detailing the hiring efforts prior to commencement of construction, which encourages all contractors of the project site to hire at least 50 percent of their workers from local Kern County communities. The project

operator shall provide the contractors a list of training programs that provide skilled workers and shall require the contractor to advertise locally for available jobs, notifying the training programs of job availability, all in conjunction with normal hiring practices of the contractor.

MM 4.15.-3 The following Cumulative Impact Oil and Gas Reservoir Pore Space Charge (CIC-ORPS) shall be implemented as an annual payment due every year for the life of the project or as a lump sum payment for multiple years until the project is decommissioned under MM 4.15-5 or the Conditional Use Permit (CUP) is modified.

1. Prior to grading or construction, a CIC-ORPS site plan shall be submitted by the applicant. The map shall calculate the CIC-ORPS net acreage as follows:
    1. Total gross acreage of the approved CUP CCS Surface Land Area.
    2. Total acres for the "net" calculation may exclude existing unpaved oilfield roads, public access easements, conservation easements and pipelines utilizing a 50 feet total width easement. All such exclusions are to be mapped and shown as to location on the CIC-ORPS site plan.
    3. Calculation for payment of the CIC-ORPS.
2. A payment of from $0 up to $400 per net acre shall be paid annually for all acres in the approved CUP regardless of phased implementation of facilities or the project injection schedule.

    The payment schedule shall be as follows:
    1. First 12 months of operation after first injection made, regardless of amount injected or months without injection activity. – no payment
    2. Year 2 – Year 6 - $200 per net acre
    3. Year 7 – Year 10 - $300 per net acre
    4. Year 11 – end of injection - $ 400 per net acre

        i. The first payment is due on the 13th month after the first date of injection of any CO_2, including any test injection. Annual payments are due every year after based on the date of the first-year payment.

        ii. d Payments shall be made to the Planning and Natural Resources Department for transfer directly to the County Administrative Office (CAO) Fiscal Division and labeled CIC-ORPS with the project name, location, and Assessor Parcel Numbers.

iii. An advance payment option for a lump sum of future payment years, 5 or more years at once, or a reduction in each year's payment for 5 or more years with a lump sum payment at the end of the reduction period, may be requested by submittal of a written request to the Kern County Planning and Natural Resources Department with details of the offer no later than 90 days before the yearly payment is due. The offer shall be reviewed and approved by the CAO.

iv. A 10% reduction in the per net acre annual payment shall be granted by the CAO for

3. To qualified injection sources, after submittal of a request, if they meet all of the following criteria.
    1. A Qualified Injection Source is a new legally permitted operating facility, that pays local property taxes, located in unincorporated Kern County on land owned by Energy that sends CO_2 to Aera CarbonFrontier (Kern County) for injection.
    2. All components of a facility, including onsite accessory electricity production or energy storage count as one facility. Only one 10% reduction will be applied on each facility that qualifies even if phased.
    3. The facility must be operating at the time of the first payment that is made that includes the reduction. The reduction will be reviewed annually by the CAO for applicability.
    4. Projects on land not owned by Aera Energy or in incorporated cities or other counties or pipelines on Aera Energy land do not qualify.
    5. The final determination on meeting the criteria and implementation of the reduction shall be made by the CAO after review of the applicant submittal. Requests for a reduction may be made no earlier than 90 days before the next scheduled payment by written letter to the Kern County Planning and Natural Resources Department who shall verify the location and facility permitting before transmitting to the CAO.
4. If at any time, the Kern County Tax Assessor verifies that the Franchise Tax Board has determined that pore space utilized for storage of CO_2 may be assessed for local property tax and a method for valuation has been established, then the CAO may request the CIC-ORPS amount be adjusted. Reduction for pore space property tax assessment or deletion of the entire CIC-ORPS may only be made by the Kern County Board of Supervisors at a noticed public hearing for the amendment of MM 4.15-3 with appropriate findings of facts.

MM 4.15-4 An annual payment of $250,000 shall be made to the Kern County Planning and

Natural Resources Department for transfer to the KCFD for equipment and training specific to the detection and control of emergency situations caused by CO_2. The first payment is due 60 days after the issuance by the U.S. Environmental Protection Agency (EPA) Class VI Underground Injection Control (UIC) permit for construction of any well. Annual payments are due every year on the date of the first-year payment.

MM 4.15-5 The owner/operator shall provide written notification that the facility is being prepared for closure and the permanent end of injection activities. The following are Kern County requirements for closure and long-term management of the CCS Surface Land Area.

A. Within 30 days of the final and last injection of CO_2 and evidence notice has been given to the EPA UIC Director of the end of all injection activities, the first payment of $100,000 (Completion Funding) shall be made, and on that annual date thereafter, to the Kern County Planning and Natural Resources Department for transfer to the CAO. The funding shall be used as determined by the Kern County Board of Supervisors for any budget item as long as consultation with all State and Federal agencies for the 50 years of required monitoring is accomplished. No bond or other instrument of credit may substitute for the required cash Completion Funding payment. Any emergency incident response and related coordination by County departments shall be billed to the owner/operator for full reimbursement at no net cost to Kern County. The Completion Funding shall **not** be reduced or offset by any potential contributions from the State or federal government to Kern County for monitoring and maintenance responsibilities.

B. Upon receipt of the one-time Completion Funding, the Kern County Planning and Natural Resources Department shall prepare a modification of the CUP for consideration at a noticed public hearing of the Kern County Board of Supervisors. The modification of the CUP shall include, but not be limited to, the necessary findings and actions to modify CUP conditions to address the carbon capture and storage project is now in long term closure and monitoring, and ending of the annual payments for the CIC-ORPS (MM 4.15-3) and the Fire Department CO_2 mitigation (MM 4.15-4).

Level of Significance after Mitigation

Impacts would be less than significant.

4.15.5 Cumulative Setting, Impacts, and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present, and reasonably foreseeable future oil and gas development including wells and abandonment activity to implement carbon capture and storage projects constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report – Revisions to the Kern County Zoning Ordinance – 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The aforementioned documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells per year county wide of various types (production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 other wells (cyclic wells, Senate Bill [SB] 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for 8 years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. California Geologic Energy Management Division permitting for all wells with the exception of plugging and abandonments has never averaged over 2,000 permits a year (as implementation in some years of the Kern County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts to public resources is considered the County. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects*, would have on public services. This geographic scope of analysis is appropriate because law enforcement, fire protection and other facilities and services are provided by the County on a County-wide basis.

Impact 4.5-4: Contribute to Cumulative Public Services Impacts

The cumulative impact analysis area for public services includes the service areas for each of the fire, police and other governmental offices/facilities serving the project site. Cumulative impacts for services are now viewed by Kern County as the fiscal impacts of the use of the land and the impacts on surrounding communities if land is utilized for industries that do not produce taxes due to a special exclusion, such as the Solar Tax Exclusion for large scale solar and lack of taxation methods for permanent CO_2 underground storage.

Public Services are funded through property tax on the land and, after construction, increased assessments on any buildings or equipment. Such building/equipment assessments decline over the life of the project based on an amortization determination as the equipment declines in value through use. While the Class VI injection wells and monitoring wells do represent equipment that normally can be assessed, oil and gas assessments are based on a company's regional holdings including the oil that could be extracted. For example, when an oil well is plugged and abandoned not only is the equipment no longer is included in assessed valuation but the actual reserves of available oil declines as well. To evaluate the potential loss of tax revenue from the State of California policies, the Board of Supervisors commissioned a report for the Oil and Gas tax revenues for the 2018–2019 tax rolls (Kern County Oil and Gas Property Tax Revenue Report July 8, 2020) (Kern County Planning and Natural Resources Department 2020). While the contribution for fiscal year 2018–2019 was over $80 million for the County General fund, that could be used for services, the amount has declined significantly over the prior 10 years and has declined another 40 percent since the 2018–2019 tax rolls. These declines are not from a lack of extractable oil but through the State of California delays in oil and gas permitting and policies to initiate the end of the use of Hydraulic Fracturing on wells statewide by 2024 and directing the California Air Resources Board to create regulations to phase out all oil production by 2045. This would impact over 2.4 million acres of land currently used for various facilities for oil and gas production that produce property tax revenue for used for provision of public services countywide.

Similar to the property tax exclusion for commercial scale solar CCS facilities have a unique property tax assessment profile. While the surface use as vacant land or agriculture would be assessed normally, the CCS Surface Land Area would not produce any more taxes related to the storage underground of the CO_2. Such capture and storage cannot be further assessed as the CO_2 is permanently stored and cannot be taken out again and used. At this time, no valuation method or other taxation process has been established that would allow the Kern County Tax Assessor to collect local property taxes on the CCS Surface Land Area. Therefore, it cannot be classified as a taxable commodity. The storage operation, however, takes up surface land that could have been used for industrial or other use that would produce additional taxes for storage. Further the use of the land, with geological reservoirs unique to oil and gas fields, for CO_2 storage precludes the use of the land for oil and gas extraction under the regulations of SB905 that does not allow the use of CO_2 associated with CCS for enhanced oil recovery and the EPA Underground Injection Control regulations that limits potential penetrations of the capstone layer or storage area to avoid leakage. Therefore, the CCS Surface Land Area is essentially placed off limits for tax generating uses while also contributing to the decline of oil revenue for the General Fund. This is a direct impact from the projects use of the land and the lack of new revenue links to the decline of County funding

which prevents the physical decline of communities, homes, and businesses. Such decline and quality of life issues for communities is directly tied to the lack of such services as code enforcement, law enforcement, fire protection, maintenance of roads, as well as health and safety issues such as elderly care and child protection services. The cumulative impacts of the Kern County known and submitted applications for proposed CCS facilities represent 37,277 acres of surface that will could be limited in tax generating uses if all are approved. While additional facility sources, which will need to be processed through project specific CUPs and EIRS, will be proposed to generate CO_2 for injection into this CCS facility, those projects increased tax revenue is specific to that project and cannot be used to justify the CCS facility impacts.

The cumulative impacts of the continued loss of oil and gas revenues due to State policies combined with these new CCS projects deepens the ongoing fiscal emergency for the County. In addition, other State policies are contributing to this fiscal crisis of land use, including the Solar Tax Exclusion which has resulted in over $103 million of lost revenue just over the last 10 years, and the lack of subvention for the Williamson Act Land Use Contracts and Farmland Security Zone contracts which provide tax reductions for qualified s use which now is over $60 million since 2009. The KCGP policies require development to address economic deficiencies in public services and facilities costs. While the project will pay Oil and Gas Tax assessment, those revenues will continue to decline based on State policies and the land will be restricted to this CCS approval with no opportunities for use of surface to generate addition revenues. This lack of revenues will contribute to the fiscal emergency that will impact surrounding communities in the unincorporated areas of the Valley and countywide.

To address this fiscal deficiency in public services revenue, MM 4.15-1 and MM 4.15-3 are being required to provide for a CIC-ORPS and maximizing sales and use tax for the County from the project. A method of maximizing use and sales tax for the project for revenues to Kern County is required under MM 4.15-1. The CIC-ORPS has been calculated based on the value of the property if utilized for oil and gas production. The amount the project will pay, in addition to property taxes, on an annual basis is calculated as $400 per net acre. The project will not pay on acres that are shown on an approved site plan as pipelines with a maximum of 50 feet wide easement, unpaved oilfield roads, recorded public access easements, and conservation easements. All land within the CUP boundary will pay the CIC-ORPS annually until the project is moves into long-term monitoring and final decommissioning and MM 4.15-5 is implemented. The CIC-ORPS is estimated to provide an estimated $3.9 million a year in addition to the Oil and Gas Valuation assessed taxes for public services. Final determination of the amount will be based on a site plan for the CCS Surface Land Area that shows the exclusions for pipelines, unpaved oilfield roads and other easements.

To ensure the Fire Department has the specialized training and equipment required to respond to a CO_2 release or other emergency event at the project, MM 4.15-5 require annual payments of $250,000 to be made to the County, commencing 60 days after the issuance of the EPA Class VI UIC permit for any well. The funding may be used by the Fire Department to support other first responders' needs to manage CO_2 releases or emergencies.

Once the project has reached capacity or has determined to cease operations and close under the EPA UIC permit protocol, MM 4.15-5 requires that in place of MM 4.15-3 (CIC-ORPS) and MM 4.15-4 (Fire Department CO_2 mitigation) funding, and annual payment of $100,000 be made and any response for incidents will be reimbursed for costs (MM 4.15-5). The funding would be used at the discretion of the Kern County Board of Supervisors for department responses to emergencies at the facility and any coordination with state and/or federal agencies responsible for long-term monitoring and maintenance of the storage area, which is currently estimated to be a 50-year time period after all injection activities cease before final closure occurs. During the monitoring period, the applicant will still have bonding in place with state and federal agencies and be accountable to the EPA and state. As the project area will no longer be paying the CIC-ORPS and oil and gas revenues, based on state policies, will have declined or even ceased, the funding can be used for any public services required County wide through the normal budget process.

Mitigation Measures

Implement MM 4.15-1 through MM 4.15-5, as described above.

Level of Significance after Mitigation

Cumulative impacts would be less than significant.

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Section 4.16

Recreation

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Section 4.16

Recreation

4.16.1 Introduction

This section of the Environmental Impact Report (EIR) describes the affected environment and regulatory setting for parks and recreation facilities. It also describes the impacts on parks and recreation facilities that would result from implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers) southwest of the community of Lost Hills and west of State Route (SR) 33.

A description of the environmental setting (affected environment) for recreation is presented below in Section 4.16.2, *Environmental Setting*, including discussion of the regional and local recreational facilities. The regulatory setting applicable to recreation is also presented in Section 4.16.3, *Regulatory Setting*, and Section 4.16.4, *Impacts and Mitigation Measures* discusses project impacts and associated Mitigation Measures.

4.16.2 Environmental Setting

Regional Setting

Kern County (County) is California's third largest county, encompassing 8,202 square miles at the southern end of the Central Valley. The project area is in the western portion of the County in the San Joaquin Valley and is bounded by Kings and Tulare Counties to the north, Santa Barbara and San Luis Obispo Counties to the west, the Tehachapi Mountains and the Sierra Nevada Mountain Range to the east, and the northern boundary of the Los Padres National Forest to the south.

Kern County provides many recreational opportunities, including camping, hiking, horseback riding, boating and water skiing, bird watching, picnicking, scenic viewing, golf, baseball and softball, and soccer facilities.

The Kern County Parks and Recreation Department manages an extensive system of regional parks designed to serve the County-wide population and small neighborhood and community parks primarily intended to meet the recreational needs of nearby residents in unincorporated communities. Including incorporated areas, Kern County contains 4,726 acres of park land with 4,282 acres of regional parks and 389 acres of local neighborhood parks, both leased and owned by the County (Kern County Parks and Recreation Department 2010).

Several national and state parks are in California's Central Valley and southern desert region, which are within and/or accessible from Kern County (Figure 4.16-1). The Sequoia National Park is

located in Kern County and is approximately 95 miles northeast of Buttonwillow. Other parks accessible from Kern County include Death Valley National Park and Kings Canyon National Park, and Mojave National Preserve, which are all at least 100 miles from Buttonwillow. The Pacific Crest Trail also traverses Kern County along a route that lies east of Tehachapi and Lake Isabella and is approximately 65 miles from Buttonwillow. The California State Parks Service owns, maintains, and operates one State Park (Red Rock Canyon), two State historic parks (Fort Tejon and Tomo-Kahni), and one State reserve (Tule Elk) in Kern County. All State parks are over 10 miles away from the project site (Figure 4.16-1).

Figure 4.16-1: Parks and Recreational Facilities in the Region

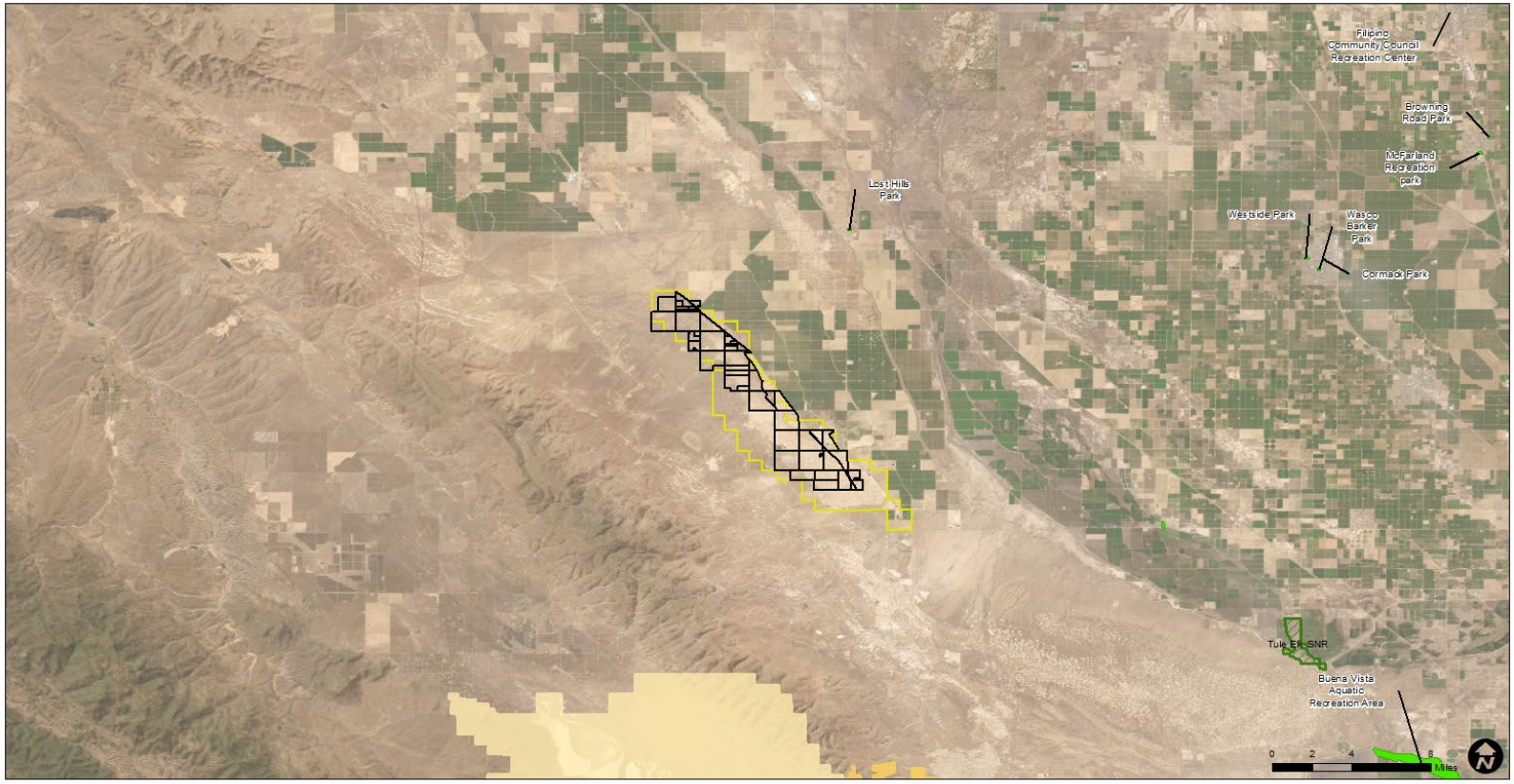

FIGURE 4-16-1:
Parks and Recreational Facilities in the Region

Draft Environmental Impact Report
Aera CarbonFrontier Project

National Parks and Trails

Several national parks are located in California's Central Valley and southern desert region, which are accessible from Kern County, although a significant distance away (Figure 4.16-1). These include Sequoia National Park, Death Valley National Park, and Mojave National Preserve.

4.16.3 Regulatory Setting

Federal

As the project is not located wholly or partially within any federal recreational facilities, there are no federal laws, regulations, or policies are applicable to recreation in relation to the proposed project.

State

As the project is not located wholly or partially within any State recreational facilities, there are no State laws, regulations, or policies are applicable to recreation in relation to the proposed project.

Local

Kern County Specific Plans

Kern County has adopted 24 Specific Plans for different geographic areas of the County. These Specific Plans are intended to be an amplification of the goals and policies of the Kern County General Plan (KCGP) and are, therefore, consistent therewith. The project site is not located wholly or partially within any adopted Specific Plan areas.

Kern County General Plan

The project site is located within the KCGP area and, therefore, would be subject to applicable policies and measures of the KCGP. The Land Use, Conservation, and Open Space Element of the KCGP include goals, policies, and implementation measures related to recreation.

1.4. Public Facilities and Services

Goals

Goal 8. Provide recreation opportunities for all citizens of Kern County while avoiding duplication between jurisdictions.

Goal 12. Provide a balanced system of parks and recreational facilities to meet Kern County's diverse needs, and clearly define responsibility for the provision of these facilities.

Goal 13. 13. Provide a variety of park and recreation programs that offer safe, equitable, and balanced recreation opportunities for all residents and visitors.

Policies

Policy 4. The provision of parks and recreational facilities of varying size, function, and location to serve County residents will be encouraged. Special attention will be directed to providing linear parks along creeks, rivers, and streambeds in urban areas.

Policy 5. Seek to provide recreational facilities where deficiencies have been identified.

Kern County Parks and Recreation Master Plan

The Kern County Parks and Recreation Master Plan (Master Plan) was published in 2010 with the primary purpose of helping guide decision-makers in the development of the Kern County park system through 2028 (Kern County Parks and Recreation Department 2010). The recommendations, goals, and strategies presented in the Master Plan were developed based on an assessment of all existing County parks and public input to identify community priorities. The project site is located within Area 4–West Kern County and the Buttonwillow Recreation and Park District (Kern County Parks and Recreation Department 2010). This western part of Kern County, which lies on the border of San Luis Obispo County, is a major oil production region, and includes the valley communities of Buttonwillow, Maricopa, and Taft, among others. As previously noted, the area is served by one regional park, seven local/neighborhood parks, one golf course, and two public buildings (Buttonwillow Recreation Building and Veterans Memorial Building). Altogether, Area 4 encompasses 1,655 acres of Kern County park land.

4.16.4 Impacts and Mitigation Measures

This section describes the impact analysis relating to recreational resources for the proposed project. It describes the methods used to determine the impacts of the project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (that is, avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion, where applicable.

Methodology

Recreational facilities and opportunities in the area were evaluated to determine whether they would be adversely affected by the project. This evaluation included consideration of the overall number and area of parklands or other recreational facilities and proximity to the project, and whether the project would result in overuse and deterioration of existing facilities or necessitate the construction of new facilities.

Thresholds of Significance

The Kern County California Environmental Quality Act (CEQA) Implementation Document and Kern County Environmental Checklist identify the following criteria, as established in Appendix G of the CEQA Guidelines, to determine whether a project could potentially have a significant adverse effect on recreation.

- A project could have a significant adverse effect on recreation if it would: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or,

- Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

Project Impacts

Impact 4.16-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities Such That Substantial Physical Deterioration Would Occur or Be Accelerated

The project would result in a temporary increase in population during construction as a result of the influx of construction workers. As proposed, the project would require a peak construction workforce of approximately 300 workers daily, which represents a minimal increase in employment over the construction period given the existing population in the vicinity of the project site. Construction workers are expected to primarily derive from an existing local and/or regional construction labor force, although some may travel to the site from various locations throughout Southern California. The number of workers expected to relocate to the surrounding area would be minimal. If temporary housing should be necessary, above and beyond accommodation in nearby hotels, it is expected that accommodations would be available in nearby communities, such as Lost Hills, Buttonwillow, and Blackwells Corner. Any construction workers who relocate to these areas may use the neighborhood and regional parks in the vicinity of the project site. The presence of the

construction workers would be temporary, intermittent and anticipated to last approximately 3 years for the project construction period starting in 2025 and concluding in 2028. Due to the limited addition of people to the area, if any, and the short-term duration of construction, the potential temporary increase in use by project personnel at any one park is not anticipated to be significant or result in a detectable physical deterioration of parks or other facilities.

Operation of the project would require long-term staff of approximately 10 personnel. It is expected that some of these individuals would already reside in the area and operation of the project would not result in a substantial influx of people (in contrast to a new residential development, school, or other use that result in large volumes of people residing or traveling to the project site). The KCGP requires 2.5 acres of parkland for every 1,000 residents. The ratio of parkland to residents is 5 acres per 1,000 residents. Therefore, an increase of approximately up to 10 individuals as a result of the project, as a worst-case scenario, would not cause this ratio to be exceeded.

As indicated in Section 4.16.2, *Environmental Setting*, the project site is within the Belridge oilfields, which are surrounded by agricultural lands and not located near any parks or recreational facilities and does not wholly or partially contain any parks or recreational facilities. Therefore, the project would not result in an increase in the use of existing parks or recreational facilities such that substantial physical deterioration would occur, and impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

Impact 4.16-2: Include Recreational Facilities or Require Construction or Expansion of Recreational Facilities That Might Have an Adverse Physical Effect on the Environment

As discussed in Impact 4.16-1, implementation of the project would not result in substantially increased use of any area recreational facilities and would therefore not require construction of new or expansion of any other existing recreational facilities. Therefore, impacts to the environment as a result of changes to recreational facilities are not expected, and impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

4.16.5 Cumulative Setting Impacts and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present and reasonably foreseeable future oil and gas development including wells and abandonment activity to implement carbon capture and storage projects constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The aforementioned documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells per year county wide of various types (production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 other wells (cyclic wells, Senate Bill [SB] 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for 8 years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. The California Geologic Energy Management Division permitting for all wells with the exception of plugging and abandonments has never averaged over 2000 permits a year (as implementation in some years of the Kern County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts to recreational resources is considered the County. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Chapter 3, Section 3.9, *Cumulative Projects*, would have on recreational resources. This geographic scope of analysis is appropriate because the recreational resources within this area are expected to be similar to those in the project site because of their proximity.

Impact 4.16-3: Cumulative Impact on Recreational Facilities

With regard to impacts to recreational facilities, the project does not have the potential to contribute significantly to cumulative impacts within the County. With regard to cumulative effects of the project, together with other projects resulting in increased use of parks (Impact 4.16-1), the project's impact would be minimal because any nominal increase in the oil and gas and carbon capture and storage workforce in the future would likely be comprised of local Kern County residents. The project's contribution to any cumulative recreation impact would not be cumulatively considerable. With regard to Impact 4.16-2, the project's impacts were determined to also be minimal for similar reasons and, therefore, would not contribute to cumulative impacts together with other projects.

The project is not expected to result in a significant increase to the population of the surrounding communities. Construction workers would result in only a temporary increase in population, and the full-time employees proposed as part of the project would only result in a minimal increase to the population of the area. Overall, the project would not bring in a substantial amount of people to warrant considerable increased use of recreational facilities in the area. A complete analysis of the cumulative impacts to recreational facilities from oil and gas operations are provided in Chapter 4.15, *Recreation*, of the Kern County Oil and Gas EIR.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Cumulative impacts would be less than significant.

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Section 4.17

Transportation

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Section 4.17

Transportation

4.17.1 Introduction

This section of the Environmental Impact Report (EIR) describes the affected environment and regulatory setting for transportation and traffic. It also describes the impacts on transportation that would result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers) southwest of the community of Lost Hills and west of State Route (SR) 33.

Information contained within this section was primarily provided by the Traffic Impact Study, prepared by Stantec Consulting Services Inc. (Stantec) (Stantec 2023) and included as Appendix I of this EIR. The Traffic Impact Study provides an analysis of existing and proposed traffic conditions. Potential traffic impacts to intersections and roadways were determined for both development/construction and operation of the project using the most recently published roadway traffic volumes and project-related vehicle trip calculations. Discussion and evaluation of transportation facilities are based on site surveys with applicable thresholds and impacts identified.

A description of the environmental setting (affected environment) for transportation and traffic is presented below in Section 4.17.2, *Environmental Setting*, including discussion of the regional and local facilities, existing conditions, and other transportation facilities in the vicinity. The regulatory setting applicable to Transportation is presented in Section 4.17.3, *Regulatory Setting*. Section 4.17.4, *Impacts and Mitigation Measures*, discusses project impacts and associated mitigation measures.

4.17.2 Environmental Setting

Kern County is California's third largest county, encompassing 8,202 square miles at the southern end of the Central Valley. The portion of the San Joaquin Valley Air Pollution Control District within Kern County serves as the regional setting for purposes of this chapter. The San Joaquin Valley Air Pollution Control District includes the entirety of San Joaquin, Stanislaus, Merced, Madera, Fresno, Tulare, and Kings Counties and part of Kern County. The project site is in the Central Valley portion of Kern County, an area that contains a variety of accessways, including regional and local roads and public transit facilities.

This section discusses the existing conditions related to transportation and traffic in the region and in the vicinity of the project site. The circulation system in the vicinity of the project site is made up of a combination of state, county, and private jurisdiction facilities. Major components of the system are discussed below.

Regional and Local Roadway Facilities

Regional access to the project site could be obtained via the numerous highways and local roadways that traverse the Belridge oilfields as shown in Chapter 3, *Project Description*.

Regional Roads

Interstate 5 is a major, four-lane, divided freeway that extends north from the Mexican border to the Canadian border and provides access for goods movement, shipping, and travel. This highway crosses the western portion of Kern County and is designated as an arterial/major highway by the Circulation Element of the Kern County General Plan (KCGP).

State Route 33 (Westside Highway) is a two-lane undivided rural highway that connects U.S. Route 101 at Ventura with Interstate 5 near Vernalis and Tracy. The highway begins in Ventura as a freeway, but changes to a rural character as it ascends the San Rafael Mountains near Ojai. SR 33 descends into the San Joaquin Valley and becomes a parallel route to Interstate 5, serving the communities of Maricopa, Taft, Avenal, Coalinga, Mendota, Los Banos, and Patterson. SR 33 ends at the junction with Interstate 5 just southeast of Tracy. SR 33 is located within a mile east of the project site.

State Route 46 (Paso Robles Highway) is a highway that connects SR 1 at Cambria with SR 99 near Wasco. The right-of-way varies between two and four lanes. The route generally runs east-west across San Luis Obispo and Kern Counties, connecting Cambria and Paso Robles in the Central Coast to Lost Hills and Wasco in the eastern Central Valley.

State Route 58 (Rosedale Highway/Mojave Freeway) begins in San Luis Obispo County, enters Kern County near McKittrick, and runs east through Bakersfield and Mojave to the County boundary past Boron to end in San Bernardino County. This route is a divided highway that runs generally east-west across Kern County, connecting Bakersfield, Tehachapi, and Mojave to Lenwood and Barstow to the east. The right-of-way varies between two and four lanes.

Local Roads

Seventh Standard Road, Oasis Drive, and Main Camp Road are among County roads that would provide access to the Belridge oilfields and ancillary facilities in the project site and also serve as links for regional traffic. Primary access to the project site would be via the main entrance to the South Belridge oilfield at the private Oasis Road off Seventh Standard Road, west of SR 33. The access road connects to a network of existing access roads within the North Belridge oilfield.

Seventh Standard Road is a one-lane local road that stretches east-west along the southern portion of the project site. The road connects directly to Interstate 5 and SR 33.

Oasis Drive is a private access north-south road within the southern portion of the South Belridge oilfield. It provides access to the main offices of Aera Energy.

Main Camp Road is a private access east-west road within the southern portion of the South Belridge oilfield. It provides access to the main offices of Aera Energy. Other county roads expected to provide east-west access to the Belridge oilfield sites include Lost Hills Road, Bountiful Road, Lokern Road, Delfern Road, Lerdo Highway, Contractors Road, Property Line Road, and Brown Material Road (Figure 3-1). These roads all operate as one-lane roadways in the vicinity of the Belridge oilfields.

Other Transportation Facilities

Public Transit Service

Kern County operates Kern Regional Transit, which operates daily bus routes within the unincorporated communities of Buttonwillow, Lamont, Kern River Valley, Frazier Park, Rosamond, and Mojave. In western Kern County, bus routes connect Bakersfield to various cities including Delano, Wasco, Taft, Lebec, and Frazier Park (KRT 2022). Kern Regional Transit also provides intercity service between Delano/McFarland/Wasco/Shafter/ Bakersfield, Lamont/Bakersfield, Lake Isabella/Bakersfield, Frazier Park/Bakersfield, California City/Mojave/Rosamond/ Lancaster/Palmdale, Lost Hills/Bakersfield, and Taft/Bakersfield. Golden Empire Transit District operates daily bus routes within the city of Bakersfield and surrounding unincorporated areas (GetBus 2022). Greyhound provides bus service from Bakersfield north to Fresno and from Bakersfield south to Los Angeles (Greyhound 2022). The project would not be located along an existing bus route and local roadways that are likely to be used during construction and operation of the project do not have bus stops.

Railways

Amtrak provides passenger rail service from Bakersfield north to Sacramento with their San Joaquin Train service (Amtrak 2022). Rail service from Bakersfield to Sacramento is provided via San Francisco. A direct connection to the south through Los Angeles is not currently provided, but high-speed rail service between San Francisco and Los Angeles via Bakersfield may be available by 2029 (Amtrak 2022; California High-Speed Rail Authority 2022). The high-speed rail would provide connections through this corridor via Fresno to Bakersfield, Bakersfield to Palmdale, and Palmdale to Los Angeles.

Freight service is provided by the San Joaquin Valley Railroad, which operates throughout the San Joaquin Valley and interchanges with the Union Pacific Railroad and the Burlington Northern Santa Fe Railroad in Bakersfield. Commodities transported by the San Joaquin Valley Railroad include petroleum and agricultural products.

Aircraft and Military Aviation

Public Airports

Commercial air travel in western Kern County is provided by Meadows Field Airport in northern Bakersfield. Direct flights are available to Los Angeles, San Francisco, Phoenix, Houston, and

other U.S. cities. Bakersfield Municipal Airport is in the south-central Bakersfield area. Other public airports include Delano Municipal Airport, Wasco-Kern County Airport, Shafter Airport-Minter Field in northern Kern County, and Taft-Kern County Airport in southwestern Kern County. Smaller public airports (averaging less than 100 aircraft operations per month) are also located in western Kern County, including Lost Hills-Kern County Airport, Elk Hills-Buttonwillow Airport, and Poso-Kern County Airport (Kern County Airport Land Use Compatibility Plan; Kern County 2012). The nearest airport to the project site is the Elk Hills-Buttonwillow Airport, a public airport located approximately 14 miles southeast of the project site. The project site is not located within any safety zone for this airport, nor is the project site located within a designated Kern County Airport Land Use Compatibility Plan.

Private Airports

A number of private airstrips are located throughout western Kern County, including Tejon Ag and Paradise Lakes airfields south of Bakersfield, Majors Airfield north of Bakersfield, Joe Gottlieb Field Airport west of Bakersfield, and Cashen Airport northwest of Wasco. There are no private airports within the vicinity of the project site.

Military Aviation

Kern County has two military aviation installations: the China Lake Naval Air Weapons Station and Edwards Air Force Base, both of which are in the eastern part of the County. Nearby in Kings County is the Lemoore Naval Air Station, located in the central San Joaquin Valley. Each installation has unique flying operations, and their primary mission is to test military aircraft and weapon systems. Due to the military bases' required flying mission, aircraft fly beyond the boundaries of the installations at supersonic speeds and sometimes as low as 200 feet above the ground. To minimize flight hazards to non-military aircraft, the military aircraft from these installations fly within restricted airspace known as the Joint Service Restricted R-2508 Complex. This complex is considered an extension of the airspace for these military aviation installations and their flying missions. Mojave Air and Space Port and Inyo Kern Airport both provide civilian flight testing and drone testing capabilities. Mojave Air and Space Port is also the first Federal Aviation Administration (FAA) licensed civilian space flight testing facility in the United States. There are no military airports within the vicinity of the project site (AirNav 2022).

Bicycle and Pedestrian Facilities

According to the 2018 Kern Region Active Transportation Plan, Kern region's bikeway network is not consistent throughout the Plan area. The Plan area includes the following cities and unincorporated areas: Arvin, Metropolitan Bakersfield (including Oildale, Lamont, and Weedpatch), Bodfish, Buttonwillow, California City, Delano, Ford City, Frazier Park, Greater Taft Area (City of Taft, Ford City, South Taft, and Taft Heights), Lake Isabella, Maricopa, McFarland, Mojave, Ridgecrest, Rosamond, Shafter, Tehachapi, and Wasco. Some cities and communities have networks that provide opportunities for safe and comfortable travel both on-street and off-street, while others lack formalized bicycle infrastructure. Additionally, significant gaps remain in the system, and closing these gaps is critical to providing good connectivity for people bicycling both within each community and while traveling between neighboring communities.

Like the Kern region's existing bikeway network, the region's pedestrian conditions vary widely. Some communities have a comprehensive sidewalk network with crossings and signage, while infrastructure is limited in other locations.

There are no dedicated pedestrian or bicycle facilities in the immediate vicinity of the project site or along the surrounding roadways. Due to the rural nature of the project site, pedestrian and bicycle traffic is limited.

4.17.3 Regulatory Setting

Federal

Federal Aviation Administration

The FAA regulates aviation at regional, public, private, and military airports. The FAA regulates objects affecting navigable airspace and structures taller than 200 feet according to Federal Aviation Regulation 14 Code of Federal Regulations (CFR) Part 77. For structures of this size, both the U.S Department of Transportation and the California Department of Transportation (Caltrans) require the proponent to submit FAA Form 7460-1, Notice of Proposed Construction or Alteration.

As described in 14 CFR 77.9 (Construction or Alteration Requiring Notice), each sponsor who proposes any of the following construction or alteration scenarios shall notify the FAA in the form and manner as follows:

If requested by the FAA, or if you propose any of the following types of construction or alteration, you must file notice with the FAA:

(a) Any construction or alteration that is more than 200 feet above ground level at its site.

(b) Any construction or alteration that exceeds an imaginary surface extending outward and upward at any of the following slopes:

  (1) 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of each airport described in paragraph (d) of this section with its longest runway more than 3,200 feet in actual length, excluding heliports.

  (2) 50 to 1 for a horizontal distance of 10,000 feet from the nearest point of the nearest runway of each airport described in paragraph (d) of this section with its longest runway no more than 3,200 feet in actual length, excluding heliports.

  (3) 25 to 1 for a horizontal distance of 5,000 feet from the nearest point of the nearest landing and takeoff area of each heliport described in paragraph (d) of this section.

(c) Any highway, railroad, or other traverse way for mobile objects, of a height which, if adjusted upward 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance, 15 feet for any other public roadway, 10 feet or the height of the

highest mobile object that would normally traverse the road, whichever is greater, for a private road, 23 feet for a railroad, and for a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it, would exceed a standard of paragraph (a) or (b) of this section.

(d) Any construction or alteration on any of the following airports and heliports:

(1) A public use airport listed in the Airport/Facility Directory, Alaska Supplement, or Pacific Chart Supplement of the U.S. Government Flight Information Publications.

(2) A military airport under construction, or an airport under construction that will be available for public use.

(3) An airport operated by a Federal agency or the U.S. Department of Defense.

(4) An airport or heliport with at least one FAA-approved instrument approach procedure.

(e) A notice for construction or alteration is not needed for the following:

(1) Any object that will be shielded by existing structures of a permanent and substantial nature or by natural terrain or topographic features of equal or greater height, and will be located in the congested area of a city, town, or settlement where the shielded structure will not adversely affect safety in air navigation.

(2) Any air navigation facility, airport visual approach or landing aid, aircraft arresting device, or meteorological device meeting FAA-approved siting criteria or an appropriate military service siting criteria on military airports, the location and height of which are fixed by its functional purpose.

(3) Any construction or alteration for which notice is required by any other FAA regulation.

(4) Any antenna structure of 20 feet or less in height, except one that would increase the height of another antenna structure.

Per 14 CFR 77.7, notification requirements include sending one executed form set of FAA Form 7460-1, Notice of Proposed Construction or Alteration, to the Manager, Air Traffic Division, FAA Regional Office having jurisdiction over the area within which the construction or alteration will be located. The notice required must be submitted at least 45 days before the earlier of the following dates: (1) the date the proposed construction or alteration is to begin; or (2) the date an application for a construction permit is to be filed.

Per the notification requirements above, the project does not meet any of the conditions requiring notification.

State

California Department of Transportation - Encroachment Permits and Transportation Permits (Oversized Permits)

Caltrans has discretionary authority with respect to highways under its jurisdiction and may, upon application and if good cause appears, issue a special permit to operate or move a vehicle or combination of vehicles or special mobile equipment of a size or weight of vehicle or load exceeding the maximum limitations specified in the California Vehicle Code. The Caltrans Transportation Permits Issuance Branch is responsible for the issuance of these special transportation permits for oversize/overweight vehicles on the State Highway System.

California Vehicle Code, Division 15, Chapters 1 through 5 (Size, Weight, and Load). Includes regulation pertaining to licensing, size, width, and load of vehicles operated on highways.

Caltrans has the discretionary authority to issue special permits for the movement of vehicles/vehicle loads that exceed statutory limitations for size or weight on state roadways as specified in Division 15 of the California Vehicle Code. Completion of a Transportation Permit application is required for Caltrans to issue a special permit (Caltrans 2022).

The project has the potential to require permits for this purpose, as trucks carrying equipment and CO_2 may exceed statutory limitations for size or weight on state roadways. This would be determined during later stages of design.

Public Resources Code Section 3237, Emergency Access

California Department of Conservation, Geologic Energy Management Division (CalGEM), State Oil and Gas Supervisor District Deputy may order the plugging and abandonment of a well that has been deserted. For purposes of this regulation, credible evidence of desertion includes, but is not limited to, an operator's failure to maintain the access road to a well site passable to oilfield and emergency vehicles (California Code Public Resources Code 3237).

The project is located on an oilfield with privately maintained and operated access roads, and therefore, is subject to this regulation.

California Street and Highway Code Section 660, 670-695, and 1450 et seq.

This code requires permits from Caltrans for any roadway encroachment during truck transportation and delivery, includes regulations for the care and protection of state and County highways, provides for the issuance of written permits, and requires permits for any load that exceeds Caltrans weight, length, or width standards for public roads.

The project will require use of County and State roadways.

Senate Bill 743

The California Environmental Quality Act (CEQA) Guidelines section 15064.3, subdivision (b) was adopted in December 2018 by the California Natural Resources Agency. These revisions to the CEQA Guidelines criteria for determining the significance of transportation impacts are primarily focused on projects within transit priority areas and shift the focus from driver delay to reduction of vehicular greenhouse gas emissions through creation of multi-modal networks, and creation of a mix of land uses that can facilitate fewer and shorter vehicle trips. Vehicle miles traveled is a measure of the total number of miles driven for various purposes and is sometimes expressed as an average per trip or per person. According to technical guidance issued by the Office of Planning and Research, projects generating less than 110 or fewer daily vehicle trips may be presumed to have a less than significant impact involving vehicle miles traveled.

Local

Kern Council of Governments 2022 Regional Transportation Plan/Sustainable Communities Strategy

The Kern Council of Governments, as a regional transportation agency, prepares the Regional Transportation Plan (RTP) to examine long-range transportation issues, opportunities, and needs for Kern County. The 2022 RTP is a 24-year blueprint that establishes a set of regional transportation goals, policies, and actions intended to guide development of the planned multi-modal transportation systems in Kern County (Kern Council of Governments 2022). The 2022 RTP includes a policy element that is shaped by goals, policies, and performance indicators, a description of planning assumptions for regional growth and future needs for travel and goods movement, a Sustainable Communities Strategy that identifies planning strategies and illustrative development patterns that would reduce greenhouse gas emissions, and a plan of action for the region to pursue to meet identified transportation needs. The RTP was developed through a continuing, comprehensive, and cooperative planning process, and provides for effective coordination between local, regional, state, and federal agencies.

The RTP promotes a more efficient transportation system that calls for fully funding alternative transportation modes, while emphasizing transportation demand and transportation system management approaches for new highway capacity. The Constrained Program of Projects (included in the 2022 RTP, Chapter 5, Strategic Investments, Table 5-1), includes projects that move the region toward a financially constrained and balanced system. Constrained projects have undergone air quality conformity analyses to ensure that they contribute to the region's compliance with state and federal air quality rules. The project would assist the County with its greenhouse gas reduction goals.

Kern County General Plan

The project site is located within the Kern County General Plan (KCGP) area; therefore, would be subject to applicable policies and measures of the KCGP. The Circulation Element and the Safety

Element of the KCGP include goals, policies, and implementation measures related to transportation and traffic that apply to the project, as described below.

Chapter 2. Circulation Element

Objectives

Objective 1. To make certain that transportation facilities needed to support development are available. To ensure that these facilities occur in a timely manner so as to avoid traffic degradation.

Objective 5. Maintain a minimum Level of Service (LOS) D for all roads throughout the County.

2.3.3. Highway Plan

Goals

Goal 5. Maintain a minimum LOS D.

Implementation Measures

Implementation Measure B. Continuity and integrity of the arterial and collector system at the mountain/valley region and the mountain/desert region boundary must be reviewed and approved in conjunction with project adoption on an individual basis.

Implementation Measure C. Conformance to alignment minimum design standards, where roadways that deviate from section and mid-section lines intersect those lines, must be reviewed and approved in conjunction with project adoption on an individual basis.

2.3.4. Future Growth

Goals

Goal 1. To provide ample flexibility in this plan to allow for growth beyond the 20-year planning horizon.

Policies

Policy 2. The County should monitor development applications as they relate to traffic estimates developed for this plan. Mitigation is required if development causes affected roadways to fall below LOS D. Utilization of the CEQA process would help identify alternatives to or mitigation for such developments. Mitigation could involve amending the Land Use, Open Space and Conservation Element to establish jobs/housing balance if projected trips in any traffic zone exceed trips identified for this Circulation Element. Mitigation could involve exactions to build offsite transportation facilities. These enhancements would reduce traffic congestion to an acceptable level.

Policy 4. As a condition of private development approval, developers shall build roads needed to access the existing road network. Developers shall build these roads to County standards unless improvements along State routes are necessary. If so, roads shall then be built to Caltrans standards.

Developers shall locate these roads (width to be determined by the Circulation Plan) along centerlines shown on the circulation diagram map unless otherwise authorized by an approved Specific Plan Line. Developers may build local roads along lines other than those on the circulation diagram map. Developers would negotiate necessary easements to allow this.

Implementation Measures

Implementation Measure C. Project development shall comply with the requirements of the Kern County Zoning Ordinance, Land Division Ordinance, and Development Standards.

2.5. Other Modes

2.5.1 Trucks and Highways

Goals

Goal 1. Provide for Kern County's heavy truck transportation in the safest way possible.

Goal 2. Reduce potential overweight trucks.

2.5.4. Transportation of Hazardous Materials

Goals

Goal 1. Reduce risk to public health from transportation of hazardous materials.

Policy 1. The commercial transportation of hazardous material, identification and designation of appropriate shipping routes will be in conformance with the adopted Kern County and Incorporated Cities Hazardous Waste Management Plan.

Policy 2. Kern County and affected cities should reduce use of County-maintained roads and city-maintained streets for transportation of hazardous materials.

Chapter 4. Safety Element

Goals

Goal 5. Ensure the availability and effective response of emergency services following a catastrophic event.

Policy 4. The County shall encourage extra precautions be taken for the design of significant lifeline installations, such as highways, utilities, and petrochemical pipelines.

4.6 Wildland and Urban Fire

Policy 1. Require discretionary projects to assess impacts on emergency services and facilities.

Policy 6. All discretionary projects shall comply with the adopted Fire Code and the requirements of the Fire Department.

Kern County Engineering, Surveying, and Permit Services Department

The Engineering, Surveying, and Permit Services Department enforces Kern County's development standards for streets and other infrastructure. The standards are applicable to all developments within Kern County that are outside of incorporated cities. Division 9 of the County's development standards specifies requirements for traffic studies. Division 1, Section 105-4, of the standards requires that all construction to connect driveway approaches to County roads must first be authorized by an Encroachment Permit. The Engineering, Surveying, and Permit Services Department's Transportation and Encroachments Permits Division issues Transportation Permits for vehicles on County roadways that carry oversized loads, as specified in the California Vehicle Code.

The traffic study prepared for the project would be consistent with the requirements of Division 9. The project would create new internal access roads on site and would therefore require an Encroachment Permit. The project would also utilize trucking for potential oversized loads transporting CO_2 and equipment and would be subject to Transportation Permits.

4.17.4 Impacts and Mitigation Measures

This section describes the impact analysis relating to transportation and traffic for the proposed project. It describes the methods used to determine the impacts of the project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion, where applicable.

Methodology

The potential impacts of vehicular traffic associated with trip generation and vehicle miles traveled (VMT) was evaluated for project construction of the facility pipeline, CO_2 injection wells, and CO_2 compression, and pumping facility, as well as for the operation of the project.

The traffic operations analysis completed by Stantec (Appendix I) included the required VMT analysis for trip generation for the project's operation, pursuant to CEQA Guidelines Section 15064.3, as well as a voluntary LOS analysis which is no longer required under CEQA having been replaced by VMT analysis pursuant to criteria set forth in Senate Bill (SB) 743 (201). The VMT analysis relied on the Governor's Office of Planning and Research's (OPR) SB 743: Technical Advisory on Evaluating Transportation Impacts in CEQA, dated December 2018. Prior to undertaking a detailed VMT analysis, the OPR Technical Advisory recommends that lead agencies conduct a screening process "to quickly identify when a project should be expected to cause a less-than-significant impact without conducting a detailed study." The OPR Technical Advisory suggests that lead agencies may screen out VMT impacts using project size criteria, maps of low VMT areas, transit availability, and provision of affordable housing. For this project, the screening criteria related to project size is applicable in regard to the amount of traffic that is generated.

The OPR Technical Advisory recommends that absent substantial evidence indicating that a project would generate a potentially significant level of VMT or inconsistency with a sustainable

communities strategy or general plan, projects that generate or attract fewer than 110 trips per day during operation may generally be assumed to cause a less-than-significant transportation impact. As is shown in the trip generation tables below, operation of the proposed project would generate 25 daily trips, which consist of up to 12 trips during the AM or PM peak hour, including daily operation and periodic maintenance trips. Thus, project operational traffic falls well below screening criteria for performing VMT analysis.

The various components of construction of the proposed project would generate 300 daily worker trips (150 trips during the AM or PM peak hour) and 15 daily construction vehicle trips. Construction traffic, however, is temporary and is therefore not applicable to the VMT transportation thresholds of significance recommended in the OPR Technical Advisory, which are based on a measurement of the operational average VMT per capita.

There may be periodic overlap of the construction phases, but only for a limited time, and construction activities would have minimal impacts to surrounding accessways as the activities are limited to within the existing Belridge oilfields facility boundaries. However, due to the construction peak hour trips being greater than 50 trips, further voluntary LOS analysis was conducted. Additional information is detailed in the Traffic Impact Study (Appendix I of the EIR).

Construction Impacts

During construction, truck trips would be routed on SR 33. Based on the information provided by Aera Energy, construction traffic would access the project site from the private Main Camp Road, either from the private Oasis Road off Seventh Standard Road or directly from Seventh Standard Road, west of SR 33. The Belridge oilfields can also be accessed from a series of entrances along the west side of SR 33. These main access points connect to a network of existing dirt roads within the field.

The analysis of construction trip generation is based on the average daily volume of construction traffic. For the purposes of this analysis, the project construction trip generation estimates are calculated based on the trips generated by heavy duty trucks (that include construction material delivery and dump trucks, water delivery trucks, etc.,) and the trips generated by the construction workers. Based on the annualized summary of anticipated equipment peak estimates, approximately 272 construction equipment vehicles total are expected to travel to the site during the three-year construction period. This would generate a total of 1,088 average daily trips (ADT), which includes two inbound and two outbound trips for construction equipment delivery to the site and two inbound and outbound trips for construction equipment removal from the site. Depending on the construction activities underway, the construction equipment requirements would vary throughout the course of any given year and across the life of the project. Based on the information provided by Aera Energy, there would be approximately 720 working days (approximately 20 working days per month over 36 months of construction) over the life of the project. The project would generate an average of 1.5 construction equipment trips per day if the 1,088 ADT is spread out equally over 720 working days. However, for the purpose of producing a conservative analysis, it was assumed that there would be 10 times the average 1.5 trips per day during peak construction

activity, thereby it was conservatively assumed that the project would generate 15 construction vehicle trips per day.

During construction, the number of workers on the site would vary daily. However, at the peak of construction, the number of workers on site would be 300 workers per day. Due to the rural nature of the project, local labor would be used to the maximum extent practical. Workers would commute to and from the project site daily from the nearby population centers. Taking these factors into account, an assumption that 50 percent of the construction workers would carpool, there would be 300 trips (150 trips inbound during the AM peak hour and 150 trips outbound during the PM peak hour).

Thus, construction of the project would generate approximately 315 daily trips, with 157 trips both during the AM and PM peak hours of a typical weekday. Trip generation estimates for construction traffic is presented in Table 4.17-1.

Table 4.17-1: Construction Phase Trip Generation

Site	Construction Worker Trips	Construction Vehicle Trips	Total Trips
Project area	300	15	315

Source: Stantec 2023

Operational Impacts

Operation of the project would include up to 10 full time employees who would operate the facility 7 days a week, 24 hours a day. Assuming 10 employees per day, there would be approximately 25 trips per day, or 12 trips in the AM and PM hours, based on an average trip rate of 2.5 trips per employee. The average trip rate of 2.5 trips per employee assumes that employee work during the day shift is two trips (one trip in and one trip out). In addition, some employees may travel an extra trip in between (for example, taking a lunch, running an errand), and there may be occasional deliveries to the site.

Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist state that a project would normally be considered to have a significant impact if it would:

- Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.
- Conflict or be inconsistent with CEQA Guidelines § 15064.3 (b).
- Substantially Increase Hazards due to a Design Feature (e.g., Sharp Curves or Dangerous Intersections) or Incompatible Uses.
- Result in Inadequate Emergency Access.

Impact 4.17-1: The Project would conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

There are no dedicated pedestrian or bicycle facilities in the immediate vicinity of the project site or along the surrounding roadways. Due to the rural nature of the project area, pedestrian and bicycle traffic is limited. The project is not located along an existing bus route and few bus stops exist on roadways that are likely to be used during construction and operation of the proposed project.

All of the two-lane roadway segments (SR 33 south of Junction Route 46, SR 33 south of Lost Hills Road, SR 33 north of Lokern Road) currently operate at an acceptable LOS ≤ B. The proposed project would conservatively generate 157 trips total in either the AM or PM peak hour during construction, and 12 trips in the AM or PM during operation which would maintain a minimum LOS D as specified in the Circulation Element of the KCGP. Construction and operation of the project would not disrupt normal traffic flows or otherwise conflict with the County's roadway performance policies and programs. Therefore, impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

Impact 4.17-2: The Project would conflict or be inconsistent with CEQA Guidelines § 15064.3 (b).

CEQA Guidelines section 15064.3, subdivision (b) was adopted in December 2018 by the California Natural Resources Agency. These revisions to the CEQA Guidelines criteria for determining the significance of transportation impacts are primarily focused on projects within transit priority areas and shift the focus from driver delay (that is, LOS) to reduction of vehicular greenhouse gas emissions through creation of multimodal networks, and creation of a mix of land uses that can facilitate fewer and shorter vehicle trips. Construction traffic would be temporary and would not permanently affect VMT characteristics in this part of Kern County or elsewhere.

Long-term, operational traffic related to project operations (for example, CO_2 storage, maintenance, and monitoring activities) would be limited. It is not known where the employees would live or how long their commuting trips would be but is assumed that they would commute from nearby communities. According to technical guidance issued by the Office of Planning and Research, projects generating less than 110 or fewer daily vehicle trips during operation may be presumed to have a less than significant impact involving VMT, and the project will generate 12 trips in the AM or PM during operations. As a result, the project would not conflict or be inconsistent with CEQA Guidelines section 15064.3.

Regarding construction, although the project would generate approximately 315 trips per day during construction, as stated above, construction VMT is temporary and is not applicable to the transportation thresholds of significance recommended in the OPR Technical Advisory, which are based on a measurement of the operational average VMT per capita. Construction related VMT, however, is addressed in the context of air quality and greenhouse gas emissions impacts (refer to Sections 4.3 and 4.8 of this EIR). Therefore, impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

Impact 4.17-3: The Project would substantially increase hazards due to a design feature (e.g., Sharp Curves or Dangerous Intersections) or Incompatible Uses (e.g., Farm Equipment).

No new roadway design or features (i.e., sharp curves, dangerous intersections, or other hazardous features) that could result in transportation-related hazards or safety concerns are anticipated. The project injection wells, and other infrastructure and facilities would be set back from roadways as required by the Kern County Zoning Ordinance. The types and numbers of vehicles utilized during injection well construction and for storage, maintenance, and monitoring activities would be similar to existing activities in the vicinity; therefore, they would not be incompatible with existing uses.

The introduction of construction-related traffic would have the potential to marginally increase accident rates, but any increase in hazards would not be substantial and would not result from the introduction of a new design feature or new incompatible use and could result in significant impacts; however, the implementation of Mitigation Measure (MM) 4.17-1, as listed below, would reduce any hazards associated with construction traffic. This measure would require information be provided regarding any movement of oversized/overweight vehicles that would require transport over publicly maintained State or County roads. Additionally, the project proponent shall provide a Construction Traffic Control Plan for Kern County and Caltrans approval.

Mitigation Measures

MM 4.17-1 Prior to the issuance of construction or building permits, the project proponent/operator shall provide a written statement of any movement of oversized/ overweight vehicles that would require transport over publicly maintained State or County roads. The following shall be implemented for any such transport:

a. Obtain all necessary encroachment permits for work within the road right-of-way, or use of oversized/overweight vehicles that will utilize County-maintained roads, which may require California Highway Patrol or a pilot car escort. Copies of the approved traffic plan and issued permits shall be submitted to the Kern County Planning and Natural

Resources Department and the Kern County Public Works Department-Development Review.

b. Prepare and submit a Construction Traffic Control Plan to Kern County Public Works Department-Development Review and the California Department of Transportation (DOT) offices for District 9, as appropriate, for approval. The Construction Traffic Control Plan must be prepared in accordance with both the California DOT Manual on Uniform Traffic Control Devices and Work Area Traffic Control Handbook and must include, but not be limited to, the following issues:
    1. Timing of deliveries of heavy equipment and building materials.
    2. Directing construction traffic with a flag person.
    3. Placing temporary signing, lighting, and traffic control devices if required, including, but not limited to, appropriate signage along access routes to indicate the presence of heavy vehicles and construction traffic.
    4. Ensuring access for emergency vehicles to the project site.
    5. Temporarily closing travel lanes or delaying traffic during materials delivery, transmission line stringing ACTIVITIES, or any other utility connections.
    6. Maintaining access to adjacent property.
    7. Specifying both construction-related vehicle travel and oversize load haul routes, minimizing construction traffic during the AM and PM peak hour, distributing construction traffic flow across alternative routes to access the project sites, and avoiding residential neighborhoods to the maximum extent feasible.
    8. Institute construction work hours as necessary, such that the arrival and/or departure times of workers would be staggered, as necessary.
    9. Identifying vehicle safety procedures for entering and exiting site access roads.

Level of Significance after Mitigation

Impacts would be less than significant after mitigation.

Impact 4.17-4: The Project would result in inadequate emergency access.

The project would generate construction trips, including the movement of oversize equipment, and the potential for temporary roadway lane closures on private roads near the project site during construction. These factors could temporarily increase the daily traffic volumes on surrounding local roadways and at intersections. However, emergency access to and from the project site would be maintained at all times, and appropriate detours would be provided, as necessary.

While the project would not require closures of public roads, during construction, heavy construction-related traffic could interfere with emergency response or emergency evacuation

procedures such as a wildfire or a chemical spill. Heavy construction-related traffic could also interfere with emergency response to other land uses in the vicinity. While it is unlikely that this potential and transitory interference would result in inadequate emergency access at a critical time, it is possible and, therefore, may, conservatively, represent a significant impact.

To ensure emergency access during construction, MM 4.17-1 requires the preparation of a Construction Traffic Control Plan and includes assurance of access for emergency vehicles and would therefore reduce potential impacts to less than significant.

Mitigation Measures

Implement MM 4.17-1, as described above.

Level of Significance after Mitigation

Impacts would be less than significant after mitigation.

4.17.5 Cumulative Setting, Impacts, and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present and reasonably foreseeable future oil and gas development including wells and abandonment activity to implement carbon capture and storage projects constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed in amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells per year county wide of various types (production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 other wells (cyclic wells, SB 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for 8 years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600

permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. CalGEM permitting for all wells with the exception of plugging and abandonments has never averaged over 2,000 permits a year (as implementation in some years of the Kern County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts to transportation is considered the western portion of Kern County. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects*, would have on transportation resources. This geographic scope of analysis is appropriate because the transportation resources within this area are expected to be similar to those in the project site because of their proximity.

Impact 4.17-5: Contribute to Cumulative Transportation Impacts

With regard to impacts to significant transportation resources, the project has the potential to contribute significantly to cumulative impacts within the region. A complete analysis of the cumulative impacts of the various ground disturbing activities from oil and gas are provided in Chapter 4.16, *Transportation and Traffic Resources* of the 2015 Final Oil and Gas EIR. Through implementation of MM 4.17-1, direct impacts to transportation resources would be avoided.

Vehicle Miles Traveled

Cumulative impacts from the project, when considered with nearby, reasonably foreseeable planned projects, would occur only during project construction because project operation traffic would be very minimal. As stated above in the evaluation of operational impacts, there would be minimal trip generation once construction activities have concluded. Therefore, operation of the project would result in less-than significant cumulative impacts. As explained, the thresholds established by the Caltrans Guide for the Preparation of Traffic Impact Studies states that project must generate 50 or more trips in the peak hour to warrant the analysis of a roadway facility. As is shown in the trip generation tables above, the various components of the project are anticipated to generate approximately 157 trips in either the AM or PM peak hour during the construction phase. There may be periodic overlap of the construction phases, but only for a limited time, and the construction activities are limited to within the existing South and North Belridge oilfield boundaries. In addition, as described above in Impact 4.17-2, construction VMT is temporary and is not applicable to the transportation thresholds of significance recommended in the OPR Technical Advisory (2018), which are based on a measurement of the operational average VMT per capita. Therefore, construction of the project would result in less than significant impacts.

Geometric Design Hazards or Incompatible Uses

On the project-level, the project would not include a design feature or utilize vehicles with incompatible uses that would create a hazard on the surrounding roadways with implementation of mitigation measures. However, construction-related traffic would have the potential to increase accident rates and could result in potentially significant impacts. Implementation of MM 4.17-1 would require information be provided regarding any movement of oversized/overweight vehicles

publicly maintained State or County roads and ensure the project's contribution to emergency access and design hazards are reduced to a less than cumulatively considerable level.

Mitigation Measures

Implement MM 4.17-1 as described above.

Level of Significance after Mitigation

Cumulative impacts would be less than significant.

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Section 4.18

Tribal Cultural Resources

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Section 4.18

Tribal Cultural Resources

4.18.1 Introduction

This section of the Environmental Impact Report (EIR) provides contextual background information on tribal cultural resources and regulatory setting for the resource. It also describes the impacts on tribal cultural resources that could result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers) southwest of the community of Lost Hills and west of State Route (SR) 33.

The analysis in this section is based on the results of the Native American consultation conducted by the County for purposes of compliance with Assembly Bill 52 (AB 52), located in Appendix J.

A description of the environmental setting (affected environment) for tribal cultural resources is presented in Section 4.18.2, *Environmental Setting*. The regulatory setting applicable to tribal cultural resources is presented in Section 4.18.3, *Regulatory Setting* and Section 4.18.4, *Impacts and Mitigation Measures*, discusses project impacts and associated mitigation measures.

Tribal Cultural Resource Terminology

As explained in Section 4.5, *Cultural Resources*, historical resources can include areas determined to be important to Native Americans, such as "sacred sites." Sacred sites are most often important to Native American groups because of the role of the location in traditional ceremonies or activities. "Cultural resources" generally refer to prehistoric and historical period archaeological sites and the built environment. Cultural resources can also include areas determined to be important to Native Americans.

For the purposes of this Tribal Cultural Resources section, the "project footprint" is defined as the area encompassing the project and associated infrastructure. See Section 4.5, *Cultural Resources*, for definitions of key tribal cultural resources terms used in this section.

4.18.2 Environmental Setting

Refer to Section 4.5, *Cultural Resources*, of this EIR for a greater discussion of the tribal cultural resources environmental setting.

Existing Tribal Cultural Resources

Native American AB 52 Consultation

Per California Public Resources Code (PRC) Section 21080.3.1, Assembly Bill (AB) 52 requires that within 14 days of a lead agency determining that an application for a project is complete, or within a decision by a public agency to undertake a project, the lead agency provide formal notification to the designated contact, or a tribal representative, of California Native American Tribes that are traditionally and culturally affiliated with the geographic area of the project (as defined in PRC Section 21073) and who have requested in writing to be informed by the lead agency (PRC Section 21080.3.1(b)). Tribes interested in consultation must respond in writing within 30 days from receipt of the lead agency's formal notification and the lead agency must begin consultation within 30 days of receiving the tribe's request for consultation (PRC Sections 21080.3.1(d) and 21080.3.1(e)).

As such, outreach letters were sent to appropriate contacts of California Native American Tribes affiliated with the geographic area of the project in accordance with PRC Section 21070 on April 14, 2022. As a result, the Yuhaaviatam of San Manuel Nation (formerly known as the San Manuel Band of Mission Indians) responded and indicated that they would not request consultation for the project. This was the only response. The results of tribal outreach for AB 52 Consultation are summarized below in Table 4.18-1.

Table 4.18-1: Assembly Bill 52 Consultation Results

Tribe	Attempts	Response
Yuhaaviatam of San Manuel Nation (Formerly known as the San Manuel Band of Mission Indians)	Email: 04/14/2022	Thank you for contacting the Yuhaaviatam of San Manuel Nation (formerly known as the San Manuel Band of Mission Indians) regarding the above-referenced project. YSMN appreciates the opportunity to review the project documentation, which was received by the Cultural Resources Management Department on April 13th, 2023. The proposed project is located outside of Serrano ancestral territory and, as such, YSMN will not be requesting to receive consulting party status with the lead agency or to participate in the scoping, development, or review of

Table 4.18-1: Assembly Bill 52 Consultation Results		
Tribe	**Attempts**	**Response**
		documents created pursuant to legal and regulatory mandates.
Tejon Tribe	Email: 04/14/2022	No response
Twenty-Nine Palms of Mission Indians	Email: 04/14/2022	No response
Torres Martinez Desert Cahuilla Indians	Email: 04/14/2022	No response

Sacred Lands File Search

Stantec contacted the Native American Heritage Commission (NAHC) on April 19, 2022. The NAHC was requested to conduct a records search from their Sacred Lands File (SLF) for the presence of Native American sacred sites or human remains within the cultural resources study area. On August 23, 2022, the NAHC acknowledged this request was received and Stantec received a response on October 20, 2022, stating that the results were negative (refer to Appendix D-2).

4.18.3 Regulatory Setting

Federal

No federal laws, regulations, or policies are applicable to tribal cultural resources in relation to the proposed project.

State

Native American Heritage Commission

Section 5097.91 of the California PRC established the NAHC, whose duties include the inventory of places of religious or social significance to Native Americans and the identification of known graves and cemeteries of Native Americans on private lands. Section 5097.98 of the PRC specifies a protocol to be followed when the NAHC receives notification of a discovery of Native American human remains from a county coroner.

Assembly Bill 52 and Related Public Resource Code Sections

AB 52 was approved by California State Governor Edmund Gerry "Jerry" Brown, Jr. on September 25, 2014. The act amended California PRC Section 5097.94, and added PRC Sections

21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3. AB 52 applies specifically to projects for which a Notice of Preparation or a Notice of Intent to Adopt a Negative Declaration or Mitigated Negative Declaration will be filed on or after July 1, 2015. The primary intent of AB 52 was to include California Native American Tribes early in the environmental review process and to establish a new category of resources related to Native Americans that require consideration under the California Environmental Quality Act (CEQA), known as tribal cultural resources. PRC Section 21074(a)(1) and (2) defines tribal cultural resources as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe" that are either included or determined to be eligible for inclusion in the California Register of Historical Resources (CRHR) or included in a local register of historical resources, or a resource that is determined to be a tribal cultural resource by a lead agency, in its discretion and supported by substantial evidence. On July 30, 2016, the California Natural Resources Agency adopted the final text for tribal cultural resources update to Appendix G of the CEQA Guidelines, which was approved by the Office of Administrative Law on September 27, 2016.

PRC Section 21080.3.1 requires that within 14 days of a lead agency determining that an application for a project is complete, or a decision by a public agency to undertake a project, the lead agency provide formal notification to the designated contact, or a tribal representative, of California Native American Tribes that are traditionally and culturally affiliated with the geographic area of the Project (as defined in PRC Section 21073) and who have requested in writing to be informed by the lead agency (PRC Section 21080.3.1(b)). Tribes interested in consultation must respond in writing within 30 days from receipt of the lead agency's formal notification and the lead agency must begin consultation within 30 days of receiving the tribe's request for consultation (PRC Sections 21080.3.1(d) and 21080.3.1(e)).

PRC Section 21080.3.2(a) identifies the following as potential consultation discussion topics: the type of environmental review necessary; the significance of tribal cultural resources; the significance of the project's impacts on the tribal cultural resources; project alternatives or appropriate measures for preservation; and mitigation measures. Consultation is considered concluded when either (1) the parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource or (2) a party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached (PRC Section 21080.3.2(b)).

If a California Native American tribe has requested consultation pursuant to Section 21080.3.1 and has failed to provide comments to the lead agency, or otherwise failed to engage in the consultation process, or if the lead agency has complied with Section 21080.3.1(d) and the California Native American tribe has failed to request consultation within 30 days, the lead agency may certify an EIR or adopt an Mitigated Negative Declaration (PRC Section 21082.3(d)(2) and (3)).

PRC Section 21082.3(c)(1) states that any information, including, but not limited to, the location, description, and use of the tribal cultural resources, that is submitted by a California Native American tribe during the environmental review process shall not be included in the

environmental document or otherwise disclosed by the lead agency or any other public agency to the public without the prior consent of the tribe that provided the information. If the lead agency publishes any information submitted by a California Native American tribe during the consultation or environmental review process, that information shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public.

California Public Records Act

Sections 6254(r) and 6254.10 of the California Public Records Act were enacted to protect archaeological sites from unauthorized excavation, looting, or vandalism. Section 6254(r) explicitly authorizes public agencies to withhold information from the public relating to "Native American graves, cemeteries, and sacred places maintained by the Native American Heritage Commission." Section 6254.10 specifically exempts from disclosure requests for "records that relate to archaeological site information and reports, maintained by, or in the possession of the Department of Parks and Recreation, the State Historical Resources Commission, the State Lands Commission, the NAHC, another State agency, or a local agency, including the records that the agency obtains through a consultation process between a Native American tribe and a State or local agency."

Local

Kern County General Plan

The project site is located within the Kern County General Plan (KCGP). The project would be subject to applicable policies and measures of the KCGP. The Land Use, Open Space, and Conservation Element of the KCGP include the following policies and implementation measures related to cultural resources that would apply to the project:

Chapter 1. Land Use, Open Space, and Conservation Element

1.10.3. – Archaeological, Paleontological, Cultural, and Historical Preservation

Policy

- **Policy 25.** The County will promote the preservation of cultural and historic resources that provide ties with the past and constitute a heritage value to residents and visitors.

Implementation Measures

- **Implementation Measure N.** The County shall develop a list of Native American organizations and individuals who desire to be notified of proposed discretionary projects. This notification will be accomplished through the established procedures for discretionary projects and CEQA documents.
- **Implementation Measure O.** On a project-specific basis, the County Planning Department shall evaluate the necessity for the involvement of a qualified Native American monitor for grading or other construction activities on discretionary projects that are subject to a CEQA document.

4.18.4 Impacts and Mitigation Measures

Methodology

The project's potential impacts to tribal cultural resources have been evaluated using a variety of resources, including an SLF search conducted by the NAHC. AB 52 notification letters were sent to Native American groups and individuals indicated by the NAHC to solicit information regarding the presence of tribal cultural resources. Using the aforementioned resources and professional judgment, impacts were analyzed according to CEQA significance criteria described below.

Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist identify the following criteria, as established in Appendix G of the CEQA Guidelines, to determine if a project could potentially have a significant adverse effect on tribal cultural resources.

A project would normally be considered to have a significant impact if it would:

- Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

  a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

  b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Project Impacts

Impact 4.18-1a: The project would cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe that is listed or eligible

for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k).

Neither the SLF searches conducted by the NAHC, nor the AB 52 consultation indicated the presence of known tribal cultural resources within or immediately adjacent to the project site. The Yuhaaviatam of San Manuel Nation replied that the proposed project is located outside of Serrano ancestral territory and, as such, YSMN will not be requesting to receive consulting party status with the lead agency.

Construction, grading, and excavation activities have the potential to unearth previously undiscovered, intact tribal cultural materials. If such materials, including human remains, are found, a potentially significant impact may occur. The project would implement Mitigation Measure (MM) 4.5-1, which requires that qualified Native American monitors be retained from a Kern County federally recognized tribe for all construction activities.

Additionally, implementation of MM 4.18-1 requires tribal consultation letters be sent to tribal organizations listed on the NAHC contact list by the applicant prior to issuance of a building or grading permit and annually by January 31 of each subsequent year of operation.

Pursuant to Section 21080.3.2(b)(1) of AB 52, the lead agency considers the consultation concluded, as the parties have agreed to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource in the event that a tribal cultural resource is uncovered during construction or operation activities.

However, the lead agency notes that that Section 21080.3.2 (c) of AB52 states a follows:

> (1) This section does not limit the ability of a California Native American tribe or the public to submit information to the lead agency regarding the significance of the tribal cultural resources, the significance of the project's impact on tribal cultural resources, or any appropriate measures to mitigate the impact.
>
> (2) This Section does not limit the ability of the lead agency or project proponent to incorporate changes and additions to the project as a result of the consultation, even if not legally required.

Mitigation Measures

MM 4.18-1 Prior to issuance of grading or building permit, the owner/operator shall send individual notification letters to all Native American Tribes listed by the California Native American Heritage Commission for the area covered by the Conditional Use Permit (CUP). The notification letter shall include a site plan, list of Assessor Parcel Numbers included in the CUP and contact information for the owner/operator. After operation, the notification letter shall be sent annually by January 31 of each year. A final letter shall be sent as part of the closure plan with contacts for the managing entity for long-term managing and monitoring. The owner/operator shall provide reasonable access and consultation for any tribal

representative with concerns or questions about tribal resources that may be within the CCS Surface Land Area or facilities within the CUP.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.18-1b: The project would cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

As noted in Impact 4.18-1a, construction, grading, and excavation activities have the potential to unearth previously undiscovered, intact tribal cultural materials, which could cause a significant impact on found materials, including human remains.

The project would implement MM 4.5-1 and MM 4.18-1 to reduce significant impacts to tribal cultural resources. Adherence to MM 4.5-1 requires that qualified Native American monitors be retained from a Kern County federally recognized tribe for all construction activities, further requiring that any found materials be treated in accordance with the California PRC. For continued coordination, MM 4.18-1 requires tribal consultation letters be sent to tribal organizations listed on the NAHC contact-list by the applicant prior to issuance of a building or grading permit and annually by January 31 of each subsequent year of operation.

Mitigation Measures

Implement MM 4.5-1 and MM 4.18-1.

Level of Significance after Mitigation

Impacts would be less than significant.

4.18.5 Cumulative Setting, Impacts, and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present, and reasonably foreseeable future oil and gas development, including wells and abandonment activity to implement carbon capture and storage projects constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential

impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provide evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities, and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells per year county wide of various types (production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 other wells (cyclic wells, Senate Bill (SB) 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for 8 years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. California Geologic Energy Management Division permitting for all wells with the exception of plugging and abandonments has never averaged over 2,000 permits a year (as implementation in some years of the Kern County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts to tribal cultural resources includes the western portion of Kern County. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects*, would have on tribal cultural resources. This geographic scope of analysis is appropriate because the tribal cultural resources within this area are expected to be similar to those in the project site because of their proximity, their similarities in environments and landforms, and their location within the same Native American tribal territories. This is a large enough area to encompass any effects of the project on tribal cultural resources that may combine with similar effects caused by other projects, and provides a reasonable context wherein cumulative actions could affect tribal cultural resources.

Impact 4.18-2: Contribute to Cumulative Tribal Cultural Resource Impacts

With regard to impacts to significant tribal cultural resources, the project has the potential to contribute significantly to cumulative impacts within the region. A complete analysis of the cumulative impacts of the various ground disturbing activities from oil and gas are provided in Section 4.5, *Cultural and Paleontological Resources* (2015 Final Oil and Gas EIR). Through

implementation of MM 4.5-1, MM 4.5-3, and MM 4.18-1, direct impacts to tribal cultural resources would be avoided, if feasible. If a significant tribal cultural resource cannot be avoided, MM 4.5-1 would ensure that significant impacts are reduced by testing or data recovery.

Potential impacts to tribal cultural resources, in combination with other projects in the area, could contribute to a cumulatively significant impact due to the overall loss of resources unique to tribes present within the region. As discussed above, no tribal cultural resources were identified; however, there is potential for unanticipated and previously unidentified tribal cultural resource discovery during project construction or operation activities.

The project would implement MM 4.5-1 to monitor construction and treat newly discovered sites, thus reducing the project impacts.

Implementation of MM 4.18-1 requires tribal consultation letters be sent to tribal organizations listed on the NAHC contact-list by the applicant prior to issuance of a building or grading permit and annually by January 31 of each subsequent year of operation. As a result of consultation, appropriate parties have agreed to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource in the event that a tribal cultural resource is uncovered during construction or operation activities.

In addition, the other projects identified in Section 3.9, *Cumulative Projects*, would also be expected to have Mitigation Measures that would reduce potential impacts on tribal cultural resources.

Therefore, impacts of the project would not have the potential to combine with impacts from past, present, or reasonably foreseeable projects to result in a cumulative impact to tribal cultural resources and cumulative impacts would be less than significant.

Mitigation Measures

Implement MM 4.5-1, 4.5-3, and MM 4.18-1.

Level of Significance after Mitigation

Cumulative impacts would be less than significant.

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Section 4.19

Utilities and Service Systems

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Section 4.19

Utilities and Service Systems

4.19.1 Introduction

This section of the Environmental Impact Report (EIR) describes the affected environment and regulatory setting for utilities and service systems. It also describes the impacts on utilities and service systems that would result from implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers) southwest of the community of Lost Hills and west of State Route (SR) 33.

The information and analysis in this section is based in part on the project-specific Water Supply Assessment (WSA) by Stantec Consulting Services Inc. (Stantec) (Stantec 2023) (see Appendix G-2), which utilizes the WSA criteria in California Water Code, as amended in 2002 by the passage of Senate Bill (SB) 610, and the groundwater and Sustainable Groundwater Management Act (SGMA) planning information presented in Section 4.10, *Hydrology and Water Quality*, in this EIR. This section describes the impacts to utilities and service systems in relation to water supply and the implementation of the SGMA that would result from implementation of the proposed project, as well as mitigation measures that would reduce these impacts.

A description of the environmental setting (affected environment) for utilities and services is presented in Section 4.19.2, *Environmental Setting*. The regulatory setting applicable to utilities and service systems is presented in Section 4.19.3, *Regulatory Setting*. Section 4.19.4, *Impacts and Mitigation Measures*, discusses project impacts and associated mitigation measures.

4.19.2 Environmental Setting

Kern County is California's third largest county, encompassing 8,202 square miles at the southern end of the Central Valley. The project area is bounded by Kings and Tulare Counties to the north, Santa Barbara and San Luis Obispo Counties to the west, the Tehachapi Mountains and the Sierra Nevada to the east, and the northern boundary of the Los Padres National Forest to the south.

The project area is characterized by heavy oil and gas exploration and production including existing well pads, processing facilities, pipeline routes, and access roads. Development in the surrounding area is predominantly oil and gas production, agricultural, and municipalities such as the towns of McKittrick, Tupman, Shafter, and Lost Hills. The project area boundaries encompass a mix of parcels that have been owned and used for oil and gas production or on which leases have been acquired by the project proponent. The nearest rural community area to the project site is Lost Hills in Kern County approximately seven miles from the project site.

Regional Setting

The Kern County Groundwater Subbasin is located in the southernmost portion of the San Joaquin Valley Groundwater Basin within the southern portion of the Great Valley Geomorphic Province of California. The San Joaquin Valley extends from the Sacramento-San Joaquin Delta/Stockton Arch on the north to the San Emigdio and Tehachapi Mountains on the south. It is bound on the east by the Sierra Nevada and on the west by the Coast Ranges, locally named the Temblor Range. Major streams in the San Joaquin Valley drain the western flank of the Sierra Nevada and include from south to north, the Kern River; Kings River; and San Joaquin River and its major tributaries Fresno, Chowchilla, Merced, Tuolumne, Stanislaus, Calaveras, Mokelumne and Cosumnes Rivers. The San Joaquin River discharges northward into the Sacramento-San Joaquin Delta. The Kern and Kings Rivers discharge internally onto the valley floor.

The Subbasin is bounded on the west by the Temblor Range, on the north by the Kings and Tulare County lines, on the east by the Sierra Nevada, and on the south and southeast by the San Emigdio and Tehachapi Mountains, respectively. The average annual rainfall in the Subbasin averages about 7 inches. Surface water in the Subbasin drains westward from the Sierra Nevada, eastward from the Temblor Range, and northward from the Tehachapi and San Emigdio Mountains. All watersheds that drain the bordering highlands discharge onto the valley floor. Major watersheds in the Subbasin that drain the Sierra Nevada include from north to south Poso Creek and the Kern River. Major watersheds that drain the Tehachapi Mountains include Caliente Creek and Tejon Creek. Major watersheds that drain the San Emigdio Mountains include from east to west Pleito Creek, San Emigdio Creek, and Santiago Creek. There are numerous small watersheds, but no major watersheds in the Subbasin that drain the Temblor Range. Other than the Kern River, most Subbasin streams are ephemeral except during above-normal and wet water years.

Flow in the Kern River is regulated by Isabella Lake Dam located about 40 miles northeast of Bakersfield to mitigate flooding and store water for agricultural, municipal, and industrial uses. Lake Isabella provides recreational opportunities. Portions of the discharges from the dam provide hydroelectric power. Once on the valley floor, streamflow in the Kern River is largely diverted for the above-mentioned uses while the residual streamflow percolates into the riverbed.

Water Supply/Groundwater Supply

There are typically three sources of supply water for development: (1) natural sources, (2) man-made sources, and (3) reclamation. Natural sources include rivers, lakes, streams, and groundwater stored in aquifers. Human-created sources include runoff water that is treated and stored in reservoirs and other catchment structures. Reclaimed water is wastewater that has been conveyed to a treatment plant and then treated to a sufficient degree that it may again be used for certain uses, such as irrigation. However, reclaimed water is not potable (drinkable) and must be conveyed in a separate system to ensure that there is no possibility of direct human consumption.

The project site is in an area without a public water purveyor that can practicably provide water for the project. The only practicable water source for the project is the underlying Kern County Subbasin.

Portions of the project are located within the service area of the Belridge Water Storage District (BWSD), which relies on imported State Water Project (SWP) surface water supplies from the California Aqueduct purchased through Kern County Water Agency (KCWA), a State Water Contractor, to meet the water supply needs of its water users. BWSD predominantly delivers SWP water to water users for agricultural purposes but also provides a small amount of water for industrial use in oil recovery operations at the Belridge oilfields.

Two existing Aera-owned groundwater wells are located in the Buena Vista Water Storage District (BVWSD). The BVWSD relies on Kern River water and to a much lesser extent on purchased SWP water from KCWA. Like BWSD, BVWSD delivers most of their surface water supplies for agricultural use. BWSD has an entitlement of 121,508 acre-feet per year (afy) of SWP water; however, annual allocations and deliveries vary significantly from year to year based on water supply conditions in the state, SWP water conveyance facilities maintenance and Endangered Species Act requirements. The BVWSD has a Kern River entitlement of 156,000 afy, which varies from year to year based on hydrologic conditions in the Kern River watershed. The BVWSD also has an entitlement of 21,300 afy and Article 21 entitlement of 3,750 afy of SWP water, which varies due to the same conditions affecting BWSD's SWP entitlement.

The Kern County subbasin has been designated as a critically overdrafted high-priority basin by the Department of Water Resources (DWR). Five Groundwater Sustainability Plans (GSPs) representing 11 Groundwater Sustainability Agencies (GSAs) were submitted to DWR as required under the SGMA. The five GSPs were prepared by a combined 11 GSAs and including 16 member agencies in the Kern Groundwater Authority (KGA) GSP to sustainably manage the Subbasin under the SGMA.

The project area is located within the Westside District Water Authority (WDWA) Plan area of the KGA GSP. A GSP chapter was prepared for the WDWA (2022), a member agency of the KGA.

Aera Energy's groundwater wells are located in an area under the jurisdiction of the Buena Vista Groundwater Sustainability Agency (BVGSA), which is a member agency of the KGA. A GSP chapter was prepared for the BVGSA (2022) and incorporated in the KGA "Umbrella" GSP. The BVGSA corresponds to the BVWSD service area and includes a subset of the BVWSD called the Buttonwillow Management Area (BMA). Because the BMA portion of the BVWSD and BVGSA contains Area Energy's groundwater wells the WSA (Appendix G-2) addresses water supply conditions in the BMA portion of the BVGSA.

The BVWSD is entitled to 156,000 afy of surface water from the Kern River; however, during the period 2006 to 2015 Kern River deliveries via the East Side Canal averaged 40,887 afy. The BVWSD is also contracted with the KCWA to receive 21,300 afy of Table A SWP water and 3,750 afy of Article 21 SWP water. During the period 2006 through 2015, the BVWSD received an average of 53,099 afy of SWP water via the California Aqueduct. Average surface water deliveries from 2006 to 2015 averaged 93,986 afy. Estimated 2020, 2030, and 2070 surface water deliveries to the BVWSD are 164,192 acre-feet (af), 161,306 af and 160,864 af, respectively.

Tables 4.19-1 and 4.19-2 show future (Water Year [WY] 2040) water supply availability in the Subbasin and WDWA Plan Area, respectively.

Table 4.19-1: Future (WY2040) Water Supply Availability in the Subbasin

Current Source	Current Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
Groundwater (Subbasin)	1,835,054	1,835,054	1,835,054	1,835,054	1,835,054
Imported Surface Water (SWP and CVP), Local Streamflow, Recycled/Reused Water	1,405,576	1,405,576	1,405,576	1,405,576	1,405,576
Total Supply	3,240,630	3,240,630	3,240,630	3,240,630	3,240,630

Source: Stantec 2023

Key:

CVP = Central Valley Project

SWP = State Water Project

Table 4.19-2: Future (2040) Water Supply Availability in the WDWA(a) and BVGSA Plan Areas

Current Source[(b)]	Current (2020) Water Supply[(c)]	Single Dry Year[(d)]	Multiple Dry Years[(c)]		
			Year 1	Year 2	Year 3
Groundwater (WDWA)	10,276	25,400	25,400	25,400	25,400
Groundwater (BVWSD)	62,742	62,742	62,742	62,742	62,742
Imported Surface Water (SWP), Groundwater Banking Recovery Water, and Carryover Water (WDWA)	275,522	266,290	266,290	266,290	266,290
Imported Surface Water (SWP), Kern River Water, and Groundwater Banking Recovery Water (BVGSA)	160,864	160,864	160,864	160,864	160,864
Total Supply	509,404	515,296	515,296	515,296	515,296

Source: Stantec 2023

Notes:

(a) An estimate of available water supplies in 2040 in the BVGSA is unavailable due to lack of sufficient data in the BVGSA Groundwater Sustainability Plan chapter (GEI 2022b) and Kern Groundwater Authority Umbrella Groundwater Sustainability Plan (GEI 2022a).

(b) af = acre-feet

(c) WDWA current year (2020) groundwater production and imported surface water deliveries, including groundwater banking recovery and carryover water are based on the 2020 Agricultural Water Management Plans for BWSD (BWSD 2021), BMWD (BMWD 2021), and Lost Hills Water District (LHWD 2021). BVGSA groundwater production estimated based on average annual production over the period WY1993 to WY2015 and estimated 2020 surface water deliveries (GEI 2022b).

(d) Single and Multiple dry year projections are based on implementation of WDWA Plan area-specific projects and management actions number 3c: pumping and reuse of 20,000 acre-feet per year of brackish groundwater underflow and estimated surface water deliveries (Aquilogic 2022). Single and multiple dry year projections for surface water deliveries to BVWSD are based on 2070 climate change factors (GEI 2022b).

Key:

BVGSA = Buena Vista Groundwater Sustainability Agency

SWP = State Water Project

WDWA = Westside District Water Authority

Aera Energy's water system within the Belridge oilfields currently delivers treated domestic water from two active groundwater production wells, Wells 9 and 10, to industrial and commercial customers. The production capacity of the two wells is 707.48 afy. Historical water demand in the water system over the past five years was 685.93 afy. The projected water demand is estimated to be 690.50 afy, which includes the project domestic water demand. Table 4.19-3 presents future (2040) water supply in Area Energy's water system.

Table 4.19-3: Future (2040) Water Supply Availability in Area Energy's Water System

			Multiple Dry Years		
Current Source	**Current (2020) Water Supply**	**Single Dry Year**	**Year 1**	**Year 2**	**Year 3**
Groundwater	685.93	690.50	690.50	690.50	690.50
Total Supply	**685.93**	**690.50**	**690.50**	**690.50**	**690.50**

Source: Stantec 2023
Note: All units are in acre-feet (af)

Wastewater

No septic systems or sewer infrastructure are currently located within the project site.

Stormwater Drainage

The project site is in a region with no existing or planned stormwater infrastructure. There are no existing stormwater drainage systems on the project site.

Solid Waste

Solid waste is a mixture of items discarded as useless or unwanted arising from residential, commercial, industrial, institutional, agricultural, and mining activities. These wastes include construction and demolition (C&D)-generated waste as well as inert wastes.

The Kern County Public Works Department Waste and Recycling Division provides environmentally safe management of solid waste and is responsible for operating seven landfills, five transfer stations, and three bin sites throughout the County.

In most cases, solid waste is hauled directly to Class III landfills, with the remainder being taken to transfer stations, resource recovery centers, or refuse-to-energy facilities. Class III landfills typically handle the disposal of non-hazardous waste. The general waste classifications utilized by the Kern County Public Works Department Waste and Recycling Division are:

- Non-hazardous solid waste, which consists mostly of household garbage, commercial wastes, agricultural waste, and litter

- Special waste, which is any waste that requires special handling, including infectious waste, pesticide containers, sewage sludge, oilfield waste, household hazardous waste, and asbestos waste
- Designated waste, which is a waste that consists of or contains pollutants that could be released at concentrations in excess of applicable water quality objectives and standards or hazardous waste that has been granted a variance from hazardous waste management requirements
- Hazardous waste, which is a waste that, because of its quantity, concentration, physical, chemical, or infectious characteristics, may either: (a) cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness; or (b) pose a substantial present or potential hazard to human health or the environment when improperly managed
- Industrial wastes, which are hazardous and non-hazardous by-products produced by oil and gas extraction, pesticide, paper, petrochemical, rubber, plastics, electronics, and other industries

Not all of the above-defined wastes may be disposed of at a landfill. State law regulates the disposal of wastes at landfills.

Kern County is responsible for compliance with the California Integrated Wastewater Management Act of 1989, Assembly Bill (AB) 939. AB 939 requires that cities and counties reduce the amount of solid waste sent to landfills by 50 percent by January 1, 2000, and requires cities and counties to prepare solid waste planning documents per AB 939. These documents include the Source Reduction and Recycling Element, the Household Hazardous Waste Element, and the Non-Disposal Facility Element. All three of these documents have been approved for Kern County, as well as an Integrated Waste Management Plan approved in February 1998 by the California Integrated Waste Management Board. The Kern County Integrated Waste Management Plan is a long-range planning document for landfill facilities.

Landfills

The Kern County Public Works Department operates seven recycling and sanitary landfills throughout the County. Landfills are located in Bakersfield, Boron, Mojave-Rosamond, Ridgecrest, Shafter-Wasco, Taft, and Tehachapi (Kern County Public Works 2023). The project would likely be served primarily by the Taft Recycling and Sanitary Landfill (Taft Landfill), located at 13351 Elk Hills Road, approximately 20 miles southeast of the project site. This Class III landfill accepts clean inerts (for example, source-separated asphalt, brick, and concrete); C&D waste (for example, asphalt, brick, concrete, dirt, and metal); dead animals; electronic waste; green waste; ordinary household trash; tires; treated wood waste; and used motor oil (Kern County Public Works 2023).

Electric Power, Natural Gas, and Telecommunications

The existing facilities on the project site are currently being served electrical power from Co-Generation Plant 32 (COGEN 32) via Aera Energy's existing substations and electrical grid system. Power supplied by COGEN 32 is backed up by standby electrical service interconnection from Pacific Gas and Electric Company (PG&E).

COGEN 32 was constructed from 1985 to 1986 to satisfy the electrical power needs of the South Belridge oilfield. COGEN 32 is composed of three turbine-driven generator sets, each able to make 20 megawatts of power. COGEN 32's output is backed up with a connection to PG&E; if the oil field requires more power than the COGEN 32 can produce or when COGEN 32 is down for maintenance, the balance is imported from PG&E.

4.19.3 Regulatory Setting

Federal

Safe Drinking Water Act

The Safe Drinking Water Act of 1974 (SDWA) gave the U.S. Environmental Protection Agency (EPA) the authority to set standards for contaminants in drinking water supplies. The EPA was required to establish primary regulations for the control of contaminants that affected public health and secondary regulations for compounds that affect the taste, odor, and aesthetics of drinking water. Under the provisions of the SDWA, the California Department of Health and Human Services (CalHHS) has primary enforcement responsibility. Title 22 of the California Administrative Code establishes CalHHS authority and stipulates State drinking water quality and monitoring standards. For additional information concerning regulatory updates and implementation of programs concerning the protection of underground sources of drinking water in accordance with the SDWA, including Class II well operations in the project area, the Underground Injection Control (UIC) program and updated UIC regulations, and the ongoing aquifer exemption program being implemented by the California Geologic Energy Management Division (CalGEM) and the EPA, see Section 4.9.2, *Hydrology and Water Quality*, Environmental Setting and Section 4.9.3, *Regulatory Setting*.

State

Energy

EnergyCalifornia's Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24 Building Standards)

The California Energy Commission administers Title 24 Building Standards, which were first adopted in 1976 in response to a legislative mandate to reduce California's energy consumption. Standards are periodically updated to allow consideration and possible incorporation of new

energy efficiency technologies and methods. California's building efficiency standards are updated on an approximately three-year cycle. The 2019 Building Standards focus on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings. The 2019 Building Standards went into effect on December 12, 2018, following approval of the California Building Standards Commission.

Water

Water Code Sections 10910 et seq.

Water Code Section 10910 et seq. were amended by SB 610 in 2001, as well as by SB 1262 in 2016, to require that a WSA be prepared by a public water system for certain projects subject to the California Environmental Quality Act (CEQA), including:

- A proposed residential development of more than 500 dwelling units
- A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space
- A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space
- A proposed hotel or motel, or both, having more than 500 rooms
- A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area
- A mixed-use project that includes one or more of the projects specified in this subdivision
- A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling-unit project

SB 1262 included amendments to incorporate groundwater management requirements under the SGMA into California water laws required by CEQA. Water Code Section 10910(b) further provides that the CEQA lead agency may prepare the WSA if a public water system that may supply water for the project cannot be identified. As discussed above, no public water system would provide more than a small portion of the water required for oil and gas activities in the project area.

Sustainable Groundwater Management Act

In 2014, California enacted the SGMA (Water Code Section 10720 et seq.). This act, and related amendments to California law, require that all groundwater basins designated as high- or medium-priority in the DWR California Statewide Groundwater Elevation Monitoring program, and that are subject to critical overdraft conditions, must be managed under a new GSP or a coordinated set of GSPs by January 31, 2020. High- and medium-priority basins that are not subject to critical overdraft conditions must be managed under a GSP by January 31, 2022. Where GSPs are required, one or more local GSAs must be formed to cover the basin and prepare and implement

applicable GSPs. The SGMA does not apply to basins that are managed under a court-approved adjudication, or to low- or very low-priority basins.

A GSA has the authority to require registration of groundwater wells, measure and manage extractions, require reports and assess fees, and request revisions of basin boundaries, including establishing new subbasins. The preparation of a GSP by a GSA is exempt from CEQA. Each GSP must include a physical description of the covered basin, such as groundwater levels, groundwater quality, subsidence, information on groundwater-surface water interaction, data on historical and projected water demands and supplies, monitoring and management provisions, and a description of how the plan would affect other plans, including city and County general plans. The SGMA requires that a GSP ensure that, within 20 years after plan adoption, the following "undesirable results" are avoided:

- Chronic lowering of groundwater levels (not including overdraft during a drought, if a basin is otherwise managed)
- Significant and unreasonable reductions in groundwater storage
- Significant and unreasonable seawater intrusion
- Significant and unreasonable degradation of water quality
- Significant and unreasonable land subsidence
- Surface water depletions that have significant and unreasonable adverse impacts on beneficial uses (Water Code Section 10721(w))

The current status of SGMA regulatory requirements in the project area, including basin and subbasin priority designations and the Western Kern Water District (WKWD) GSA, is discussed in Section 4.10.3, *Regulatory Setting*, of Section 4.10, *Hydrology and Water Quality.*

The DWR has determined that processed water generated by oil and gas production is not groundwater. A comprehensive, detailed record of the groundwater in the Kern County basins, which include both the project and cumulative projects, and the SGMA plans, are provided in Section 4.9, *Hydrology and Water Quality* of the Kern County Oil and Gas Supplemental Recirculated EIR (SREIR) (2020/2021).

The SGMA allows for multiple GSPs implemented by multiple GSAs and coordinated pursuant to a single coordination agreement that covers the entire basin to be an acceptable planning scenario (Water Code § 10727). In the San Joaquin Valley Kern County Subbasin, six GSPs were prepared by 17 GSAs for the various management areas established in the subbasin pursuant to the coordination agreement and submitted to the California V for review. Collectively, the six GSPs and the coordination agreement are referred to as the Plan for the Subbasin. Individually, the GSPs include the following:

- Kern Groundwater Authority Groundwater Sustainability Plan, amended July 2022, prepared by the KGA GSA, Semitropic Water Storage District GSA, Cawelo Water District GSA, City of McFarland GSA, Pioneer GSA, WKWD GSA, and WDWA GSA

- Amended Kern River Groundwater Sustainability Plan, July 2022, prepared by the Kern River GSA and Greenfield County Water District GSA
- BVWSD GSA Groundwater Sustainability Plan, July 2022, prepared by the BVWSD GSA
- Olcese Groundwater Sustainability Agency Groundwater Sustainability Plan, July 2022, prepared by the Olcese Water District GSA
- Henry Miller Water District Groundwater Sustainability Plan, July 2022, prepared by the Henry Miller Water District GSA
- South of Kern River Groundwater Sustainability Plan, July 2022, prepared by the Arvin GSA, Tejon-Castac Water District GSA
- Wheeler Ridge-Maricopa GSA

On March 2, 2023, the DWR deemed the six GSPs inadequate for the following deficiencies:

Deficiency 1: involved how the Plan established and justified undesirable results that represent effects caused by groundwater conditions occurring throughout the subbasin.

Deficiency 2: involved the establishment of minimum thresholds for the chronic lowering of groundwater levels.

Deficiency 3: involved the establishment of sustainable management criteria for land subsidence.

These findings are based on all uses of groundwater in the region and not specific to oil and gas production.

Under the SGMA, the Groundwater Authorities are required to begin implementation of the plans, although found inadequate, while working to amend the plans and address the deficiencies.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act authorizes the regulation of California water rights and water quality by the State Water Resources Control Board (SWRCB). This act also established nine Regional Water Quality Control Board (RWQCBs) to ensure that water quality on local/regional levels is maintained. The project area is under the jurisdiction of the Central Valley RWQCB.

California Department of Water Resources California's Groundwater (Bulletin 118)

California's Groundwater (Bulletin 118) is the State's official publication on the occurrence and nature of groundwater in California. The publication defines the groundwater basin boundaries and summarizes groundwater information for each of the State's 10 hydrologic regions. *California's Groundwater* features current knowledge of groundwater resources, including information on the location, characteristics, use, management status, and conditions of the State's

groundwater. The publication also presents findings and recommendations that support the future management and protection of groundwater.

Wastewater

Senate Bill 1281, Disclosure of Oil and Gas Water Use and Disposal

SB 1281, effective January 2015, amended Sections 3226.3 and 3227 of the Public Resources Code (PRC) to require that: (1) CalGEM provide the SWRCB with an annual "inventory of all unlined oil and gas field sumps" and (2) well operators provide CalGEM with quarterly information regarding the source and disposition of water produced by or used in oil and gas production in addition to existing obligations to report gas and oil production and produced water information on a monthly basis. The new quarterly reporting requirements include information regarding: (a) the source and volume of any water, including produced water (also subject to monthly reporting), including the water used to generate or make up the composition of any injected fluid or gas, identified by water source if more than one water source is used, (b) the volume of untreated water suitable for domestic or irrigation purposes used in oil and gas operations, (c) the treatment of water and the use of treated or recycled water in oil and gas field activities including, but not limited to, exploration, development, and production, and (d) the specific disposition of all water used in or generated by oil and gas field activities, including water produced from each well as reported in an operator's monthly reports, and separated by volume of disposition if more than one disposition method is used.

The amendments retain certain previous monthly reporting requirements in Section 3227, including: (1) the amount and gravity of oil, gas and water, and the number of days fluid was produced from each well, (2) the number of drilling, producing, injecting, or idle wells owned or operated by a person subject to reporting requirements, (3) the disposition of gas produced from each field, (4) the disposition of produced water each field and the amount of fluid or gas injected into each well used for enhanced recovery, underground storage of hydrocarbons, or wastewater disposal. In August 2015 the SWRCB stated in a letter to CalGEM (then, DOGGR) that for the purposes of reporting under Section 3227, "water suitable for domestic or irrigation purposes" should be interpreted to mean water with a TDS concentration of 10,000 milligrams per liter or lower (CalGEM 2019).

Oil and Gas-Related Wastewater Disposal

Federal, State, and local laws, regulations, and policies pertaining to the disposal of oil and gas-related produced water and other wastewater in the project area are discussed in detail in Section 4.9, *Hydrology and Water Quality, Regulatory Setting*.

Solid Waste

California Department of Resources Recycling and Recovery (formerly California Integrated Waste Management Board)

California Department of Resources Recycling and Recovery (CalRecycle) is the State agency designated to oversee, manage, and track California's 76 million tons of waste generated each year. It is one of the six agencies under the umbrella of the California Environmental Protection Agency (CEQA). CalRecycle develops regulations to control and manage waste, for which enforcement authority is typically delegated to the local government. CalRecycle works jointly with local governments to implement regulations and fund programs.

California Integrated Waste Management Act (AB 939)

California adopted its first statewide, general recycling program in 1989. The Integrated Waste Management Act of 1989 (PRC 40050 et seq. or AB 939, codified in PRC 40000), administered by CalRecycle, requires all local and County governments to adopt a Source Reduction and Recycling Element to identify means of reducing the amount of solid waste sent to landfills. This law set reduction targets at 25 percent by the year 1995 and 50 percent by the year 2000.

Assembly Bill 341

AB 341 (Chesbro, Chapter 476, Statutes of 2011), approved by Governor Brown on October 5, 2011, established a new statewide goal of 75 percent recycling composting and source reduction by 2020. In contrast to earlier diversion mandates, disposal-related activities, including alternative daily cover, alternative intermediate cover, transformation, waste tire-derived fuel, and beneficial reuse at solid waste landfills, do not count toward the statewide recycling goal.

To achieve the 75 percent recycling goal, CalRecycle has identified six primary focus areas: (1) moving organics out of the landfill, (2) continuing reform of the Beverage Container Recycling Program; (3) expanding the recycling/manufacturing infrastructure; (4) exploring new models for State and local funding of materials management programs; (5) promoting State procurement of post-consumer recycled content products, and (6) promoting extended producer responsibility.

Electric Power, Natural Gas, and Telecommunications

California Public Utilities Commission

The California Public Utilities Commission (CPUC) regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies, in addition to authorizing video franchises. In 1911, the CPUC was established by Constitutional Amendment as the Railroad Commission. In 1912, the legislature passed the Public Utilities Act, expanding the Railroad Commission's regulatory authority to include natural gas, electric, telephone, and water companies as well as railroads and marine transportation companies. In 1946, the Railroad Commission was renamed the CPUC. It is tasked with ensuring safe, reliable utility service is available to consumers, setting retail energy rates, and protecting against fraud.

Local

Kern County General Plan

The project area is located within the Kern County General Plan (KCGP) area and, therefore, would be subject to applicable policies and measures of the KCGP. The Land Use, Conservation, and Open Space Element and the Energy Element of the KCGP includes goals, policies, and implementation measures related to utilities and service systems that apply to the project, as described below.

Chapter 1. Land Use, Conservation, and Open Space Element

1.4. Public Facilities and Services

Goals

Goal 1. Kern County residents and businesses should receive adequate and cost effective public services and facilities. The County will compare new urban development proposals and land use changes to the required public services and facilities needed for the proposed project.

Goal 5. Ensure that adequate supplies of quality (appropriate for intended use) water are available to residential, industrial, and agricultural users within Kern County.

Goal 9. Serve the needs of industries and Kern County residents in a manner that does not degrade the water supply and the environment and protect the public health and safety by avoiding surface and subsurface nuisances resulting from the disposal of hazardous wastes, irrespective of the geographic origin of the waste.

Policy 1. New discretionary development will be required to pay its proportional share of the local costs of infrastructure improvements required to service such development.

Policy 3. Individual projects will provide availability of public utility service as per approved guidelines of the serving utility.

Policy 15. Prior to approval of any discretionary permit, the County shall make the finding, based on information provided by the CEQA documents, staff analysis, and the applicant, that adequate public or private services and resources are available to serve the proposed development.

Implementation Measures

Implementation Measure C. Project developers shall coordinate with the local utility service providers to supply adequate public utility services.

Implementation Measure L. Prior to the approval of development projects, the County shall determine the need for fire protection services. New development in the County shall not be approved unless adequate fire protection facilities and resources can be provided.

Implementation Measure N. Secure complete and accurate information on all hazardous wastes generated, handled, stored, treated, transported, and disposed of within or through Kern County.

Implementation Measure O. Reduce to the greatest degree possible the amount of waste to be disposed of by encouraging private industry to construct and manage a high quality system of transfer stations, recycling facilities, treatment plants, and incinerators located near the generators of hazardous waste.

Implementation Measure R. Roads and highways utilized for commercial shipping of hazardous waste destined for disposal will be designated as such pursuant to Vehicle Code Sections 31303 et seq. Permit applications shall identify commercial shipping routes they propose to utilize for particular waste streams.

1.8 Industrial

Policies

Policy 1. Locations for new industrial activities shall be provided with adequate infrastructure (water, sewage disposal systems, roads, drainage, etc.) to minimize effects on County services.

1.10 General Provisions

1.10.1 Public Services and Facilities

Policies

Policy 9: New development should pay its pro rata share of the local cost of expansions in services, facilities, and infrastructure which it generates and upon which it is dependent.

Policy 15: Prior to approval of any discretionary permit, the County shall make the finding, based on information provided by the California Environmental Quality Act (CEQA) documents, staff analysis, and the applicant, that adequate public or private services and resources are available to serve the proposed development.

Policy 16: The developer shall assume full responsibility for costs incurred in service extension or improvements that are required to serve the project. Cost sharing or other forms of recovery shall be available when the service extensions or improvements have a specific quantifiable regional significance.

Implementation Measures

Implementation Measure C: Project developers shall coordinate with the local utility service providers to supply adequate public utility services.

Implementation Measure D: Involve utility providers in the land use and zoning review process.

Implementation Measure E: All new discretionary development projects shall be subject to the Standards for Sewage, Water Supply, and Preservation of Environmental Health Rules and

Regulations administered by the County's Public Health Services Department. Those projects having percolation rates of less than five minutes per inch shall provide a preliminary soils study and site-specific documentation that characterize the quality of upper groundwater in the alternative septic systems would adversely impact groundwater quality. If the evaluation indicated that the uppermost groundwater at the proposed site already exceeds groundwater quality objectives of the RWQCBs or would if the alternative septic system is installed, the applicant would be required to supply sewage collection, treatment, and disposal facilities.

Amended Kern Groundwater Authority Groundwater Sustainability Plan

The KGA GSA prepared an Amended KGA GSP in 2022, to comply with the SGMA and serve as a comprehensive foundation for groundwater management within areas of the Kern County Subbasin covered by the KGA. The KGA's jurisdictional boundary is entirely within the subbasin, as defined in DWR Bulletin 118, south of the Tulare Lake Hydrologic Region of the San Joaquin Valley Groundwater Basin. The plan provides information on the current groundwater conditions, establishes the sustainability goals to be achieved through the implementation of management actions and projects, and demonstrates how sustainability would be achieved through the 20-year implementation period. On March 2, 2023, the DWR deemed the GSP inadequate for the following deficiencies:

Deficiency 1: involved how the Plan established and justified undesirable results that represent effects caused by groundwater conditions occurring throughout the subbasin.

Deficiency 2: involved the establishment of minimum thresholds for the chronic lowering of groundwater levels.

Deficiency 3: involved the establishment of sustainable management criteria for land subsidence.

These findings are based on all uses of groundwater in the region and not specific to oil and gas production.

Under the SGMA, the Groundwater Authorities are required to begin implementation of the plans, although found inadequate, while working to amend the plans and address the deficiencies.

Kern Integrated Regional Water Management Plan

The Kern Region published an Integrated Regional Water Management Plan update in 2020. The 2020 Tulare Lake Basin Portion of Kern County Integrated Regional Water Management (IRWM) Plan Update (2020 Plan Update) includes new information as required by the DWR 2016 Integrated Regional Water Management Proposition 1 Guidelines. IRWM is a collaborative effort to manage all aspects of water resources in a region. The State recognizes that there is a need to consider a broader range of resource management issues, competing water demands, new approaches to ensuring water supply reliability, and new ways of financing. The State's IRWM program was developed beginning with SB 1672, which created the Integrated Regional Water Management Act to encourage local agencies to work cooperatively to manage local and imported water supplies to improve water quality, quantity, and reliability.

Tulare Lake Basin Portion of Kern County Integrated Regional Water Management Plan

The Tulare Lake Basin Portion of Kern County Region, as defined for this Integrated Regional Water Management Plan, consists of that portion of the Tulare Lake Basin hydrologic region that is within Kern County, with small additional areas that are included for hydrologic reasons. The purpose of the Integrated Regional Water Management Plan is to develop a cooperative regional framework, implementation plan, and context for managing water resources in the Kern region. Objectives detailed by the plan for the Kern region include to increase water supply, improve operational efficiency, improve water quality, promote land use planning and resource stewardship, and improve regional flood management.

West Kern Water District 2020 Urban Water Management Plan

The 2020 Urban Water Management Plan (UWMP) was prepared for WKWD in Kern County, California and describes the District's water supply, water demands, water reliability, and water conservation efforts. The document provides estimated population growth and water demands through the year 2045 and serves as a long-range planning document for the District.

The primary water facilities in the District include the following:

- 13 active groundwater wells (one inactive well)
- 26 above ground water storage tanks
- 15 booster pump stations
- 306 miles of distribution pipelines
- Recharge basins of approximately 415 acres
- Recharge basins in project vicinity of approximately 6,862 acres
- Recharge basins in Tule Elk reserve of approximately 729 acres

The District primarily pumps groundwater but balances this extraction by recharging its SWP water and other supplemental water supplies. Water supply for WKWD is obtained from wells located in the northeast corner of the District in the underflow area of the Kern River Basin and from an area north and adjacent to the State of California's Tule Elk Reserve.

The District is within the Kern County Groundwater Subbasin. According to the DWR, California Bulletin 118, the subbasin is in a water-short condition. The Kern Groundwater Subbasin was identified as being "critically overdrafted" by DWR. DWR also identified the subbasin as "High Priority" due to overdraft, land subsidence, and groundwater quality degradation. Similarly, the Kern Groundwater Subbasin has been designated by the SGMA as a high priority.

Kern County and Incorporated Cities Hazardous Waste Management Plan

In 1991, Kern County and the incorporated cities adopted the Kern County and Incorporated Cities Hazardous Waste Management Plan, which was developed to comply with State Law (California Health and Safety Code Section 25135 et seq.). The Hazardous Waste Management Plan includes goals, policies, and implementation measures directed at the safe and responsible management of hazardous waste, including waste stream management, source reduction, siting of new facilities, and other provisions. The safe management of hazardous waste is to be accomplished in accordance with federal, State, and local laws.

Kern County Integrated Waste Management Plan

The Kern County Public Works Department is required by the State to plan and implement waste management activities and programs in the County unincorporated area to assure compliance with AB 939 and subsequent State mandates. The Kern County Integrated Waste Management Plan includes a Reduction and Recycling Element, Household Hazardous Waste Element, and Non-disposal Facility Element. The Plan was approved in February 1998 by the California Integrated Waste Management Board (now California Department of Resources Recycling and Recovery, or CalRecycle). The Kern County Integrated Waste Management Plan is the long-range planning document for landfill facilities.

Kern County Construction Waste Diversion Requirements per the California Green Building Code

As part of compliance with the State of California Green Building Code Requirements (known as CALGreen) that took effect beginning January 2011, Kern County implemented the following construction waste diversion requirements:

- Submittal of a Construction Waste Management Plan prior to project construction for approval by the Kern County Building Department;
- Recycling and/or reuse of a minimum 65 percent of C&D waste; and
- Recycling or reuse of 100 percent of tree stumps, rocks, and associated vegetation and soils resulting from land clearing.

Kern County Public Works Department Recycling Programs

The Waste Operations Division of the Kern County Public Works Department administers or sponsors the following recycling programs, which contribute toward meeting State-mandated solid waste diversion goals to achieve 75 percent recycling, composting, or source reduction of solid waste by 2020:

- Recycling programs at landfills to recycle or divert a wide variety of products, such as wood waste, cathode ray tubes, tires, inert materials, and appliances.
- Drop-off recycling centers for household recyclables. The County- and the city-operated drop-off recycling centers, which are located in the unincorporated metropolitan area and the city, may be used by both County and city residents.
- Financial assistance for the operation of the City of Bakersfield Green Waste Facility.
- The Kern County Special Waste Facility for the disposal of household hazardous waste. Services are provided to all Kern County residents.
- Semi-annual "bulky waste" collection events, which are held in the Bakersfield area and available to both County and city residents (co-sponsor).
- Christmas tree recycling campaign (participates jointly with the City of Bakersfield).
- Telephone book recycling program (co-sponsors with Community Clean Sweep).
- Community Clean Sweep summer workshops called "Trash to Treasure," which educate children about recycling and other Kern County Waste Management Department programs (sponsor).
- An innovative elementary school program called the "Clean Kids Hit the Road Puppet Show" (operates in collaboration with Community Clean Sweep).
- Recycling trailers for churches, schools, and nonprofit organizations.

4.19.4 Impacts and Mitigation Measures

Methodology

Potential impacts on utilities and service systems associated with the construction and operation of the project have been evaluated using a variety of resources, including multiple online sources and published documents, as well as the project-specific WSA (Stantec 2023; Appendix G-2). The discussion below lists specific impacts and measures that would be incorporated to mitigate and reduce potential impacts, to the extent feasible.

Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist identify the following criteria, as established in Appendix G of the *CEQA Guidelines*, to determine if a project could potentially have a significant adverse effect on utilities and service systems.

A project could have a significant adverse effect on utilities and service systems if it would:

- Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects.
- Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years.
- Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.
- Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals.
- Comply with federal, State, and local management and reduction statutes and regulations related to solid waste.

Project Impacts

Impact 4.19-1: Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects.

Construction

Water

Water usage during construction, primarily for dust-suppression purposes, is not expected to exceed 400 af; impacts would be potentially significant without mitigation.

Wastewater

Construction of the project would generate a minimal volume of wastewater. During construction activity, wastewater contained within portable toilet facilities and hand-washing facilities would be disposed of at an approved off-site disposal site. The Kern County Public Health Services Department Environmental Health Services Division is responsible for monitoring the use of portable toilet facilities, and the project proponent would be required to provide documentation of a portable toilet pumping contract. No off-site sewage or disposal connections to a municipal sewer system exist or are proposed. Therefore, construction of the project would not require or result in the relocation or construction of new or expanded wastewater treatment facilities, the construction or relocation of which could cause significant environmental effects. Impacts would be less than significant.

Stormwater Drainage

The project would be required to adhere to Kern County Public Works Department stormwater requirements, which include measures to address stormwater controls on both management of runoff volume and water quality, including controlling erosion and protection of water quality of stormwater runoff. Additionally, in compliance with National Pollutant Discharge Elimination System (NPDES) General Construction Permit requirements, the proposed project would design and submit a site-specific Storm Water Pollution Prevention Plan (SWPPP) to minimize the discharge of wastewater during construction and a Water Quality Management Plan that includes best management practices for runoff control, as described in Section 4.10, *Hydrology*.

Construction of the project would not exceed the capacity of existing stormwater drainage systems in the area. Therefore, the project is not anticipated to result in the relocation or construction of new or expanded stormwater drainage facilities, the construction or relocation of which could cause significant environmental effects. Impacts would be less than significant.

Electric Power

As described in Chapter 3, *Project Description*, the project proposes to construct and maintain 1.26 miles of new 115-kilovolt (kV) transmission lines to the substations located within the project site. To support the major construction efforts, electrical connections are anticipated to be in place prior to significant field activities, which would require the installation of 17 wooden poles. Construction of the power line interconnection would involve temporary ground disturbance around each new power pole location (approximately a 50-foot radius) as well as temporary ground disturbance associated with access to each pole location (approximately a 15-foot-wide access route). All new poles and access thereto would be located within existing oil field production areas or along a dirt road. Transmission power line construction is anticipated to take approximately six months. Construction of the project would therefore require expanded electrical power facilities. However, all new utilities would be located within the project footprint, which has been analyzed throughout Chapter 4 sections of this EIR. Therefore, no additional impacts beyond what have already been disclosed throughout the EIR would occur. Impacts would be less than significant.

Natural Gas

The project would not use natural gas during the construction phase. Therefore, construction of the project would not require or result in the relocation or construction of new or expanded natural gas facilities, the construction or relocation of which could cause significant environmental effects. Impacts would be less than significant.

Telecommunications

Installation of telecommunication equipment including underground and overhead telephone, fiber optics, and wireless communications infrastructure such as cellular, satellite, or microwave towers are not proposed as a part of the project. Therefore, construction of the project would not require or result in the relocation or construction of new or expanded telecommunication facilities,

the construction or relocation of which could cause significant environmental effects. Impacts would be less than significant.

Operation

Water

As described in detail under Issue 2 below, commercial water demand for the project is expected to be on average 1,223 afy (26,000 barrels per day). Water demands would be supplied by treated produced water from the Belridge oilfield, and SWP water would only be used if sufficient water is allocated under Aera Energy's water rights. Groundwater would be minimally used as potable water to control rooms, fire/emergency supplies as needed, facility housekeeping, and chemical dilution. Fresh water demands for the project would be purchased from existing BWSD SWP entitlements and other existing long-term water contracts with individuals and delivered to the project area via BWSD's 415 North Canal and/or 500 Canal and existing pipeline. Aera Energy also has approximately 7,000 af of surplus SWP water stored in various groundwater banking projects through the BWSD that may be accessed at any time, subject to the groundwater banking project's pumping capacity. Domestic water demands estimated at 21.72 afy, would be supplied by Area Energy's two existing groundwater wells in the BVWSD. The amount of water available is thus sufficient to meet the projected demand for the operation of the project. Therefore, the operation of the project would not require or result in the relocation or construction of new or expanded water facilities, the construction or relocation of which could cause significant environmental effects. Impacts would be less than significant.

Wastewater

The capture facilities proposed by the project would yield approximately 800,000 gallons of wastewater per day. The wastewater produced by the project would be piped to existing on-site oilfield-produced water infrastructure, which handles approximately 17 million gallons per day. Therefore, the operation of the project would not require or result in the relocation or construction of new or expanded wastewater treatment facilities, the construction or relocation of which could cause significant environmental effects. Impacts would be less than significant.

Stormwater Drainage

The project would be required to adhere to Kern County Public Works Department stormwater requirements, which include measures to address stormwater controls on both management of runoff volume and water quality, including controlling erosion and protection of water quality of stormwater runoff. The site is currently an oil field with a large amount of open space and minimal impervious area. The impervious area consists primarily of roads, parking lots, and buildings. The proposed improvements would add a minimal amount of impervious area to the overall project site, however, there are currently no proposed improvements for the on-site drainage due to the minimal addition of impervious areas (Appendix G-1). Therefore, the operation of the project would not result in the relocation or construction of new or expanded stormwater drainage facilities, the construction or relocation of which could cause significant environmental effects. Impacts would be less than significant.

Electric Power

As described in Chapter 3, *Project Description*, the project would require transmission-level service interconnection as the project site load demand increases. The expected maximum electric load of the project is approximately 49 megawatts, supplied by PG&E via Aera Energy-owned equipment, to power all facility processing, pumps, maintenance, monitoring, control, and communication systems. Therefore, the proposed project would the expansion of electrical facilities including the Aera Energy-owned 115 kV transmission power line interconnection, two Aera Energy-owned 115 kV/12 kV substations, and two transmission lines to serve the CO_2 capture facilities. The two transmission lines include an approximate 0.46-mile overhead transmission power line interconnect from Aera Energy's existing 115 kV power line along SR 33 to a new on-site Aera Energy-owned 115/12 kV substation, and an approximate 0.8-mile overhead transmission power line interconnect from Aera Energy's existing 115 kV power line along Hill Road within the South Belridge oilfield to a new on-site Aera Energy-owned 115/12 kV substation adjacent to GP 32. Operation of the project would therefore increase electric load within the project area and require expanded electrical power facilities. However, all new utilities would be located within the project footprint, of which has been analyzed throughout Chapter 4 sections of this EIR. Therefore, no additional impacts beyond what has already been disclosed throughout the EIR would occur. Impacts would be less than significant.

As provided in *Chapter 3, Project Description*, upgrades to two existing PG&E electrical substations may be required at full project build-out. The Temblor Substation is located on approximately one acre of land owned by PG&E and located four miles south of Seventh Standard Road within the northeast corner of Section 27, Township 29 South, Range 21 East. The replacement or expansion of the existing substation may be required with an expansion of the existing footprint. This upgrade would be implemented by PG&E and permitted at that time through the CPUC. The Midway Substation is located east of the town of Buttonwillow along Highway 58, within the southeast corner of Section 13, Township 29 South, Range 23 East. The existing PG&E property covers approximately 256 acres, and the current substation occupies approximately 150 acres. The expansion of the existing substation may be required at full project build-out. The substation upgrade would be implemented by PG&E.

Natural Gas

The project proposes to send natural gas to the existing Gas Conditioning Facility, or Gas Plant 32 (GP 32) for further processing and component separation. The natural gas would then be transferred to the steam generation facilities for use as fuel. Therefore, operation of the project would not require or result in the relocation or construction of new or expanded natural gas facilities, the construction or relocation of which could cause significant environmental effects. Impacts would be less than significant.

Telecommunications

Installation of telecommunication equipment including underground and overhead telephone, fiber optics and wireless communications infrastructure such as cellular, satellite, or microwave towers would be minimal to connect new facilities to the applicant's existing supervisory control and data acquisition network. Therefore, the operation of the project would require minimal

relocation or construction of new or expanded telecommunication facilities, the construction or relocation of which could cause significant environmental effects. Impacts would be less than significant.

Mitigation Measures

The improvements are analyzed as part of the construction and operation of the proposed project and analyzed and mitigated in Section 4.10, *Hydrology*.

Level of Significance After Mitigation

Impacts would be less than significant.

Impact 4.19-2: Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years.

Construction Water Demands

The project estimates a water demand of approximately 400 af over an approximate three-year construction period. Proposed construction water demands for the project are anticipated to be purchased from existing BWSD SWP entitlements and other existing long-term water contracts with individuals and delivered to the project area via BWSD's 415 North Canal and/or 500 Canal and existing pipeline. Aera Energy also has approximately 7,000 af of surplus SWP and Kern River water banked in various groundwater banking projects through the BWSD that may be accessed at any time, subject to the groundwater bank's pumping capacity.

Operational Water Demands

The project estimates an operational water demand on average of up to approximately 1,223 afy (26,000 barrels per day) for the commercial operation. Commercial operation, also known as industrial operation, is the water use anticipated within the CO_2 capture facilities. Water demands for commercial operation would be provided by treated produced water from Aera Energy. Proposed domestic water demands for operation of the project would be provided by two existing Aera Energy-owned groundwater wells located in the BVWSD.

The sufficiency of the project water supply is analyzed on three bases: (1) the physical availability of the project area aquifer, and wells drilled therein, to provide groundwater in the amounts required for project construction and operation, (2) the estimates (in the 2020 WKWD UWMP) of normal water years, single dry water years, and multiple dry water years, water supply and demand-related water availability, and (3) the availability of groundwater for the project in compliance with SB610. (Appendix G-2).

Tables 4.19-4 and 4.19-5 present future water supply versus project water demand in WY2040 based on Attachment H in *Kern Groundwater Authority Groundwater Sustainability Plan*. The projected water budgets presented in the sustainability plan extend from 2021 to 2070 and take into account climate change factors and implementation of projects and management actions to

sustainably manage groundwater supplies in the Subbasin. Table 4.19-4 describes future water supply versus project water demand for commercial use, while Table 4.19-5 describes future water supply versus project water demand for domestic use. As shown in Tables 4.19-4 and 4.19-5, there is ample supply of water available to the project within the WDWA plan area to meet project water demands.

Table 4.19-4: Future (WY2040) Water Supply in the Subbasin (a) Versus Commercial Project Water Demand at Build-Out[(b)]

Current Source	Current Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
Groundwater (Subbasin)	1,835,054	1,835,054	1,835,054	1,835,054	1,835,054
Imported Surface Water (SWP and CVP), Local Streamflow, Recycled/Reused Water	1,405,576	1,405,576	1,405,576	1,405,576	1,405,576
Total Project Demand[(b)]	1,223	1,223	1,223	1,223	1,223
Total Supply	3,239,385	3,239,385	3,239,385	3,239,385	3,239,385

Notes:
(a) All units in acre-feet.
(b) Total project demand is the sum of the estimated quantity of industrial water and domestic water.

Table 4.19-5: Future (2040) Water Supply Versus Domestic Project Demand at Build-Out in Area Energy's Water System

Current Source	Future (2040) Water Supply	Single Dry Year	Multiple Dry Years		
			Year 1	Year 2	Year 3
Groundwater	707.48	707.48	707.48	707.48	707.48
Total Project Demand[(a)]	21.72	21.72	21.72	21.72	21.72
Estimated Surplus/Shortfall	685.76	685.76	685.76	685.76	685.76

Notes:
All units in afy
Estimates from Aera
(a) Assumes only the commercial operation domestic water demand portion of the project that may be supplied by Area Energy's water system.

The WSA (Appendix G-2) concluded that a sufficient water supply is available and that the project water supply is in accord with California Water Code 10910, as amended in 2002 by the passage of SB 610's normal year/dry year/multiple dry year requirements. Further stating that though the estimated annual demand for the project is not a de minimis use compared to existing available water supplies in the Subbasin, commercial project water demand is estimated to average up to

1,223 afy and would be produced water from Area Energy's Belridge oilfield. Aera Energy also has approximately 7,000 af of surplus surface water stored in various groundwater banking projects through the BWSD that may be accessed at any time, subject to the groundwater bank's pumping capacity.

Domestic water demands for commercial operation of the project are estimated to be 21.72 afy and would be provided by Area Energy's water system. As a result, there are adequate water supplies available in the WDWA and BVGSA plan areas to serve the proposed project under all water year conditions. However, water supplies have the potential to be adversely affected if the project in the future demands more water than is available. The Kern County subbasin, as a whole, has an overdraft of 324,326 af per year over the baseline conditions of which the KGA is approximately 239,346 af of the deficit. Should the project require water supplies in excess of the allotment from the District, impacts to water supplies would be considered potentially significant. To address this, Mitigation Measure (MM) 4.19-1 would be implemented, ensuring that any groundwater or reclaimed water used is accounted for and regulated. Therefore, with mitigation, the project would have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years and impacts would be less than significant.

Mitigation Measures

MM 4.19-1 Prior to issuance of a construction permit for any carbon capture and storage project applicant, the owner/operator shall provide information on any groundwater or reclaimed water that will be used. Unmetered water wells cannot be used as a source of groundwater for the permit activity. Groundwater may only be used in a permitted activity from a water well equipped with a water meter. The Planning and Natural Resources Department shall compile the water use information in a report that shall be posted on the Kern County Planning and Natural Resources website for public use by December 31 of each calendar year. A copy shall be sent to all GSAs and the KCWA after being posted on the website. The information submitted on the permit shall include the following data:

a. The source and estimated amount of any groundwater being used in the permit activity.

b. Confirmation that any water well used in permit activity is metered.

c. The source and estimated amount of any reclaimed water used in the permit activity.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.19-3: Result in a Determination by the Wastewater Treatment Provider Which Serves or May Serve the Project That It Has Adequate Capacity to Serve the Project's Projected Demand in Addition to the Provider's Existing Commitments.

As discussed under Impact 4.19-1, the capture facilities proposed by the project would yield approximately 800,000 gallons of wastewater per day. The wastewater produced by the project would be piped to existing on-site oilfield-produced water infrastructure, which handles approximately 17 million gallons per day. Additionally, new septic systems or holding tanks would be installed at the new control rooms. Therefore, no new wastewater infrastructure or treatment capacity would be required off site. Impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

Impact 4.19-4: Generate Solid Waste in Excess of State or Local Standards, or in Excess of the Capacity of Local Infrastructure, or Otherwise Impair the Attainment of Solid Waste Reduction Goals

Construction

During construction of the project, it is possible that generate solid waste in excess of State or local standards and infrastructure may be generated. However, it is anticipated the project would not generate substantial amounts of non-recyclable waste during construction. Materials would be recycled where feasible, with remaining disposal in landfills in compliance with all applicable regulations. In addition, materials brought to the project site would be used to construct facilities, and few residual materials are expected. Common construction waste may include metals, masonry, plastic pipe, rocks, dirt, cardboard, or green waste related to land development. Any hazardous waste generated during construction would be disposed of at an approved facility. Due to the generation of a substantial amount of waste by the project, construction impacts of the project on existing landfills may be potentially significant without mitigation.

Non-hazardous construction refuse and solid waste would either be collected and recycled or disposed of at a local landfill. As discussed above, the project would likely be served primarily by the Taft Landfill approximately 19 miles southeast of the project site. The Taft Landfill has a remaining capacity of 6,896,633 cubic yards with an anticipated closure year of December 31, 2076 (CalRecycle 2019). As noted above, this landfill accepts batteries, clean dirt, clean inerts (e.g., source-separated asphalt, brick and concrete); C&D waste (for example, asphalt, brick, concrete, dirt, and metal); dead animals; electronic waste; green waste; ordinary household trash; tires; treated wood waste; and used motor oil. MM 4.19-2 ensures that any solid waste produced by the construction of the project is properly maintained as well as recycled where feasible, thus

reducing the amount of waste transported to landfills. By complying with the landfill's regulations and restrictions and through implementation of MM 4.19-2, the solid waste generated by construction of the project would be maintained and impacts to landfills would be reduced to less than significant.

Operations

Drilling and production wastes would be non-hazardous. Most drilling and production wastes would be managed using one of the following methods (all of which require compliance with applicable laws and regulations):

- Underground injection, such as in disposal wells;
- On-site burial, such as in pits, and landfills of non-hazardous drilling muds;
- Land treatment, such as by land spreading, land farming, and road spreading of non-hazardous oily dirt;
- Evaporation; and
- Discharge to evaporation and percolation ponds.

Other types of waste generated during operations may include wood, metal equipment parts, damaged tools, construction debris, excess soil and vegetation generated from cutting and grading, concrete residue, pallets, cardboard boxes, papers, plastics, banding materials, scrap steel, scrap aluminum, scrap wire, and general trash. These wastes are collected at specially permitted in-field solid waste transfer stations or disposed of in on-site permitted facilities, or transported to off-site landfills or recycling facilities, as appropriate, on a regular basis. Transfer stations consist of containers where waste is collected for transfer to Kern County landfills or other approved sites.

The California Solid Waste Reuse and Recycling Access Act of 1991, as amended, requires expanded or new development projects to incorporate storage areas for recycling bins into the project design. Reuse and recycling of construction debris would conserve landfill space.

During the operational phase of the project, it is possible for on-site processes to generate solid waste in excess of State or local standards and infrastructure if not properly regulated or maintained on-site. The Taft Landfill is expected to serve the project through its operational phase. By complying with the landfill's regulations and restrictions, the solid waste produced by the project would be maintained and impacts related to landfill capacity would be less than significant.

Decommissioning

Wells would undergo plugging and abandonment once storage capacity targets have been met. Idle wells that are not yet plugged and abandoned would be maintained in compliance with CalGEM regulations. In decommissioning a formerly producing oil well, equipment such as pumping units, well cellars, facility pipelines, and other associated infrastructure would be disassembled and salvaged or appropriately disposed of. The same is valid for CO_2 injection and monitoring wells associated with geologic storage. Decommissioning of the wells is expected to

generate solid waste, which has the potential to exceed State or local standards and infrastructure if not properly regulated and maintained. As discussed above, the Taft Landfill is expected to be in operation through 2076. By complying with the landfill's regulations and restrictions, along with the implementation of MM4.19-2, impacts related to landfill capacity would be less than significant after mitigation.

Mitigation Measures

MM 4.19-2 During construction activities for project facilities, the Applicant shall not store construction waste onsite for longer than the duration of the construction activity or transport any waste to any unpermitted facilities. The applicant shall also reduce construction waste transported to landfills by recycling solid waste construction materials, such as taking materials to recycling and reuse locations listed in the brochure on recycling construction and demolition materials available on the Kern County Public Works Department, website.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.19-5: Comply With Federal, State, and Local Management and Reduction Statutes and Regulations Related to Solid Waste.

AB 341 requires Kern County to attain a waste diversion goal of 75 percent by 2020 through reduction, recycling, or composting. In addition, as part of compliance with CALGreen requirements, Kern County implements the following construction waste diversion requirements:

- Submittal of a Construction Waste Management Plan;
- Recycle and/or reuse a minimum 65 percent C&D waste; and
- Recycle or reuse 100 percent of tree stumps, rocks, and associated vegetation and soils resulting from land clearing.

During the construction, operational, and decommissioning phases of the project, it is possible for the project to generate solid waste that would be inconsistent with the reduction goals of federal, State, and local management. Should the project not take action to comply with these statutes and regulations related to solid waste, the project may result in potentially significant impacts to solid waste. MM 4.19-2, as described above, would ensure that solid waste generated during the construction of the project is maintained and reduced. Implementation of MM 4.19-2 along with compliance with applicable statutes and regulations would ensure compliance with policies to reduce waste sent to landfills, reducing impacts to less than significant.

Mitigation Measures

Implement MM 4.19-2, as described above.

Level of Significance after Mitigation

Impacts would be less than significant.

4.19.5 Cumulative Setting, Impacts, and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present and reasonably foreseeable future oil and gas development including wells and abandonment activity to implement carbon capture and storage projects constitute cumulative impacts. Kern County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report – Revisions to the Kern County Zoning Ordinance – 2015I Focused on Oil and Gas Local Permitting,* certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; an SREIR certified on March 8, 2021; and an Addendum adopted on August 23, 2020 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The documents provide a projection of future production in the entire oil field over 25 years of 3,649 new wells per year county wide of various types (production, water disposal, water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 other wells (cyclic wells, SB 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for 8 years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. CalGEM permitting for all wells with the exception of plugging and abandonments has never averaged over 2,000 permits a year (as implementation in some years of the Kern County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts to utilities and service systems is the Belridge oilfields. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects* of this EIR, would have on utilities and service systems. This geographic scope of analysis is appropriate because utilities and service resources within this area are expected to be similar to those in the project site because of their proximity; similar environments, landforms, and hydrology would result in similar land uses and project operations.

Impact 4.19-6: Cumulative Impacts on Utilities and Service Systems

With regard to impacts on utilities and service systems, the project has the potential to contribute significantly to cumulative impacts within the region. A complete analysis of the cumulative impacts of the various ground-disturbing activities from oil and gas are provided in Chapter 4.17, *Utilities and Service Systems* of the Oil and Gas Final EIR. Through implementation of MM 4.19-1 and MM 4.19-2 water used and solid waste generated by the project would be regulated and maintained.

Stormwater Drainage

As described above, the project site is located in a region with no existing or planned stormwater infrastructure. There are no existing stormwater drainage systems on the project site, and no stormwater drainage infrastructure is proposed as part of the project. The project would be required to adhere to Kern County Public Works Department stormwater requirements, which include measures to address stormwater controls on both management of runoff volume and water quality, including controlling erosion. Further, the hydrologic study and final drainage plan required by MM 4.10-2 would detail any necessary design features required to properly control stormwater runoff on site. Cumulative projects would also be required to prepare a hydrologic study and final drainage plan that would help avoid substantial increases in stormwater generated on site by their respective ground disturbance. Depending on the findings of their respective hydrologic studies and final drainage plans, these projects may need to construct stormwater control structures on site to reduce the potential for increased stormwater runoff. Other projects in the vicinity would be required to offset substantial increases in stormwater per County requirements and would also be required to implement best management practices, as well as comply with the NPDES General Construction Permit and their respective SWPPP as applicable. Therefore, the project would not substantially contribute to a cumulative impact on stormwater drainage facilities.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

Electric Power

As described above, the project would require transmission-level service interconnection as the project site load demand increases. The project proposes to construct and maintain 1.26 miles of new 115 kV transmission lines to the substations located within the project site. The replacement or expansion of the existing substations may also be required with an expansion of the existing footprint, which would be implemented by PG&E. Construction of the project would, therefore, require expanded electrical power facilities.

Although the project would require extension of new electrical facilities, all new utilities would be located within the project footprint, cumulative impacts of which have been analyzed throughout Chapter 4 sections of this EIR. Therefore, no additional cumulative impacts beyond what has already been disclosed throughout the EIR would occur. Other projects in the vicinity would be expected to provide their own analysis regarding their expected expansion of electric power. This project in combination with other cumulative projects would, therefore, not substantially contribute to a cumulative impact on electrical demand and facilities.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

Natural Gas

No natural gas is proposed to be used in conjunction with the proposed project. Therefore, the project would not contribute to a cumulatively considerable impact related to natural gas demand and facilities.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

Telecommunications

The project in combination with cumulative projects would increase demand on telecommunication facilities. However, demand associated with the project and other cumulative development would be minimal and is expected to be within the planning forecasts of the affected telecommunications provider. Therefore, cumulative impacts related to telecommunications facilities would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

Wastewater

Wastewater produced during construction (which is not disposed of via septic systems) would be collected in portable toilet facilities and portable hand wishing facilities and disposed of at an approved facility. The capture facilities proposed by the project would yield approximately 800,000 gallons of operational wastewater per day. The wastewater produced by the project would be piped to existing on-site oilfield-produced water infrastructure, which handles approximately 17 million gallons per day. New septic systems or holding tanks would be installed at the new control rooms. Other planned projects may or may not propose facilities that would require the installation of a septic system. Depending on the facilities proposed to be built by these projects, other projects in the vicinity would be required to comply with applicable regulations and policies regarding the disposal of wastewater, thus minimizing impacts. Therefore, the project would not have the potential, when combined with impacts from past, present, or reasonably foreseeable projects, to result in a cumulative impact on a regional wastewater treatment facility or the capacity of said facilities.

Mitigation Measures

No mitigation measures are required.

Level of Significance

Impacts would be less than significant.

Solid Waste

As described above, demolition and construction materials would be recycled where feasible, with remaining disposal in landfills in compliance with all applicable regulations. In addition, materials brought to the project site would be used to construct facilities, and few residual materials are expected. Non-hazardous construction refuse and solid waste would either be collected and recycled or disposed of at a local landfill. In addition, the project would generate a minimal amount of solid waste during operation and is not expected to significantly impact Kern County landfills. The Taft Landfill is expected to operate until 2076 and could accommodate solid waste generated during construction, and operation. Based on the California Air Resources Board and EPA permit conditions for the project, decommissioning of the project may not occur until past the 50-year lifespan of the Taft Landfill. Based on the State of California's goals and policies for disposal of such waste, it is unknown the exact technological facilities that would be in place but some form of disposal for the site is mandated to be implemented by Kern County by law. However, the generation of waste from cumulative projects could result in a cumulative impact. To ensure that the project reduces the amount of waste sent to landfills, implementation of MM 4.19-2 requires that any waste generated shall be recycled to the extent feasible. With the implementation of MM 4.19-2, the project's incremental contribution would be less than cumulatively considerable. Furthermore, other cumulative projects would also be required to comply with State and local waste reduction policies.

Mitigation Measures

Implementation of MM 4.19-2 would be required.

Level of Significance after Mitigation

Less than Significant.

Water Supply

Several carbon capture and storage and industrial projects are proposed within the groundwater basins in the region that would further impact the existing water supply, which is derived from the Kern County subbasin. The project and other cumulative projects would substantially decrease groundwater supplies.

Fresh water would be sourced from existing SWP entitlements with the BWSD and from existing Aera Energy-owned groundwater wells located in the BVWSD. Fresh water sourced from SWP entitlements would be minimally used for utility purposes. As described in detail under Issue 2 above, the amount of water available is sufficient to meet the projected demand for the project and SWP water needs would not exceed the volume available under Aera Energy's existing water contracts. Implementation of MM 4.19-1 would further ensure that any groundwater or reclaimed water used is accounted for should the project require additional water supplies in excess of the allotment from the District. Other projects in the vicinity would also be required to comply with similar water supply regulations. However, the basin is currently over drafted and the District's GSP has been deemed inadequate along with the other Kern subbasin plans where the other similar known and unknown projects could occur. Therefore, the cumulative impacts of any use of groundwater in the area are considered significant and unavoidable after all feasible and reasonable mitigation.

Mitigation Measures

Implementation of MM 4.19-1 and MM 4.19-2 would be required.

Level of Significance after Mitigation

Cumulative impacts would be significant and unavoidable for groundwater supply (Impact 4.19-2).

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Section 4.20

Wildfire

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Section 4.20
Wildfire

4.20.1 Introduction

This section of the Environmental Impact Report (EIR) describes the affected environment and regulatory setting for wildfire. It also describes the impacts on wildfire that would result from the implementation of Aera Energy's (project proponent) proposed CarbonFrontier Project (project). The project site is a specific set of parcels (see Chapter 3, *Project Description*) within the South and North Belridge oilfields (Belridge oilfields), not the entirety of the oilfield itself, in western Kern County, California. The Belridge oilfields are contiguous and located approximately 7 miles (11 kilometers) southwest of the community of Lost Hills and west of State Route (SR) 33

The analysis in this section is based on the project components, California Department of Forestry and Fire Protection's (CAL FIRE) Fire Hazards Severity Zone (FHSZ) maps for Kern County, and based in part on the Biological Resources Technical Report (prepared by Stantec Consulting Services Inc. (Stantec) (Stantec 2023) and included as Appendix C-1 of this EIR.

A description of the environmental setting (affected environment) for wildfire is presented in Section 4.20.2, *Environmental Setting*. The regulatory setting applicable to wildfire is presented in Section 4.20.3, *Regulatory Setting*. Section 4.20.4, *Impacts and Mitigation Measures*, discusses project impacts and associated mitigation measures.

4.20.2 Environmental Setting

Site Characteristics and Fire Environment

The entirety of the project area lies within the Belridge oilfields. The project area is characterized by heavy oil and gas exploration and production including existing well pads, processing facilities, pipeline routes, and access roads. Development in the surrounding area is predominantly oil and gas production, agricultural, and municipalities such as the towns of McKittrick, Tupman, Taft, and Buttonwillow. The project area boundaries encompass a mix of parcels that have been owned and used for oil and gas production or on which leases have been acquired by the project proponent. The project site primarily consists of developed land and sparse desert vegetation.

CAL FIRE maps FHSZs are based on factors such as fuel, slope, and fire weather to identify the degree of fire hazard throughout California (that is, moderate, high, or very high). While FHSZs do not predict when or where a wildfire will occur, they do identify areas where wildfire hazards could be more severe and therefore are of greater concern. According to the CAL FIRE FHSZ maps for Kern County, the project site is classified as a State Responsibility Area (SRA) (CAL FIRE 2024c). The project site is not within a Federal Responsibility Area (FRA) or Local Responsibility Area (LRA). According to the 2024 CAL FIRE, SRA FHSZ map, the project site is classified as SRA moderate and high (Figure 4.20-1). The areas surrounding the project site are categorized as SRA high and very high. Moderate zones are typically wildland-supporting areas

of low fire frequency and relatively modest fire behavior. High zones are typically wildland-supporting areas that support medium to high-hazard fire behavior and roughly average burn probabilities or developed/urbanized areas with moderate vegetation cover and more limited nonburnable cover.

Fire History

Fire history information can provide an understanding of fire frequency, fire type, most vulnerable project areas, and significant ignition sources. Fire history represented in this section uses CAL FIRE's Incident Maps that show fires back through 2016 (CAL FIRE 2024b) and CAL FIRE's Fire and Resource Assessment Program (FRAP) Wildfire Perimeters by Decade Greater Than 5,000 Acres, 1950-2023 (CAL FIRE 2024a). Based on a review of these maps, no fires in the recorded history have burned across the project site.

Vegetation (Fuels)

Within the project site, two plant communities (Allscale Shrubland and Red Brome or Mediterranean Grass Grasslands) and one landcover type (Disturbed/Developed) were mapped. The most prevalent habitat type within the site was Allscale Scrub. The community is characterized by an open to continuous canopy with a variable herbaceous layer near the ground, which includes seasonal annuals and non-native grasses. Commonly known as salt-scrub or Saltbush Scrub communities, these common arid-land upland communities are found in flat or hilly areas of the southern San Joaquin Valley and are typically characterized by alkaline soils and open canopy with interspersed shrubs with varying densities dependent on slope, aspect, and moisture levels.

A description of the vegetation communities and land cover types, along with applicable acreage of each within the Biological Study Area (BSA), are provided in Table 4.20-1, which is based on the Biological Resources Technical Report prepared by Stantec (Appendix C-1).

Table 4.20-1: Vegetation Communities and Land Cover Types

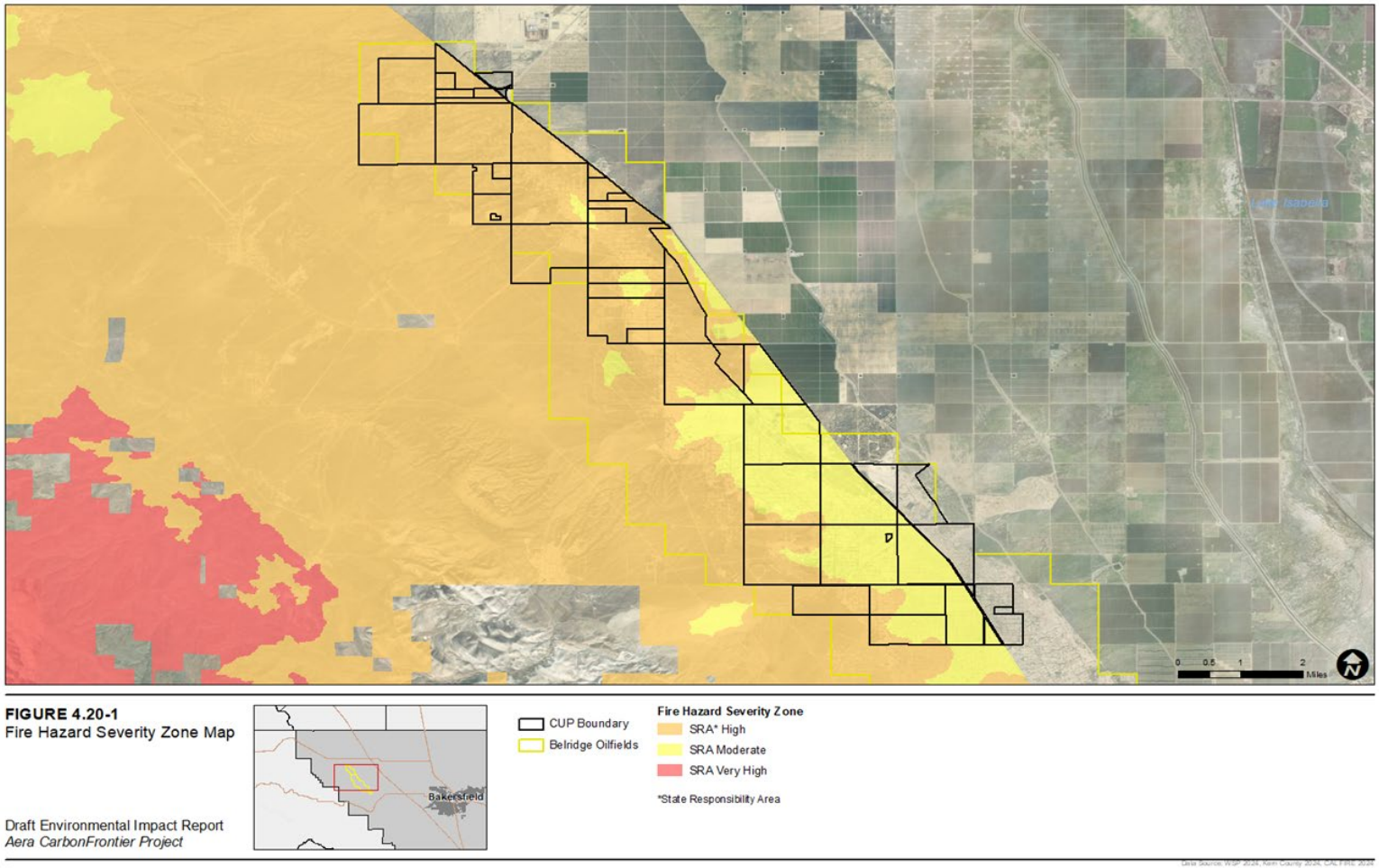
Vegetation Community/Land Cover Type	Acreage Within BSA	Acreage of Permanent Project Impacts[a]	Acreage of Temporary Project Impacts[b]
Disturbed/Developed	2,179.20	86.63	170.73
Allscale Shrubland	870.28	1.57	43.09
Red Brome or Mediterranean Grass Grasslands	225.49	0.86	4.74
Total	**3,274.97**	**89.06**	**218.56**

Source: Stantec 2023

Key:

BSA = Biological Study Area

Figure 4.20-1: Fire Hazard Severity Zone Map



4.20.3 Regulatory Setting

Federal

No federal laws, regulations, or policies are applicable to wildfire in relation to the proposed project.

State

2022 California Fire Code

The 2022 California Fire Code (Title 24, Part 9 of the California Code of Regulations) establishes regulations to safeguard against the hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures, and premises. The Fire Code also establishes requirements intended to provide safety for and assistance to firefighters and emergency responders during emergency operations. The provisions of the Fire Code apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal, and demolition of every building or structure throughout California. Chapter 6 (Building Services and Systems) of the Code focuses on building systems and services as they relate to potential safety hazards and when and how they should be installed. Building services and systems are addressed and include emergency and standby power systems, electrical equipment, wiring and hazards, and stationary storage battery systems. Chapter 33 (Fire Safety During Construction and Demolition) of the Code outlines general fire safety precautions to maintain required levels of fire protection, limit fire spread, establish the appropriate operation of equipment, and promote prompt response to fire emergencies. The Fire Code includes regulations regarding fire-resistance-rated construction, fire protection systems such as alarm and sprinkler systems (for inhabited structures), fire service features such as fire apparatus access roads, means of egress, fire safety during construction and demolition, and wildland-urban interface areas.

2022 California Building Code, Chapter 7A

Chapter 7 of the 2022 California Building Code details the materials, systems, and assemblies used in the exterior design and construction of new buildings located within a Wildland-Urban Interface Fire Area. A Wildland-Urban Interface Area is defined in Section 702A as a geographical area identified by the state as a FHSZ, in accordance with the Public Resources Code Sections 4201 through 4204 and Government Code Sections 51175 through 51189, or other areas designated by the enforcing agency to be at significant risk from wildfires. The building code details the materials, systems, and assemblies used for structural fire resistance and fire-resistance-rated construction separation of adjacent spaces to safeguard against the spread of fire and smoke within a building and the spread of fire to or from buildings.

Public Resources Code 4291–4299

California Public Resources Code Section 4291-4299 et seq. requires that brush, flammable vegetation, or combustible growth within 100 feet of buildings be maintained. Vegetation that is more than 30 feet from the building, less than 18 inches high, and important for soil stability, may

be maintained; as may single specimens of trees or other vegetation that are maintained so as to manage fuels and not form a means of rapid fire transmission from other nearby vegetation to a structure. Additionally, the Public Resources Code outlines infraction fees, certification, and compliance procedures applicable to State and local building standards, including those described in subdivision (b) of Section 51189 of the Government Code.

Local

Kern County General Plan

The project site is located within the Kern County General Plan (KCGP) area; therefore, would be subject to applicable policies and measures of the KCGP. The Safety Element of the KCGP includes goals, policies, and implementation measures related to public safety and recreation that apply to the project, as described below.

Chapter 4. Safety Element

4.6. Wildland and Urban Fire

Policies

Policy 1. Require discretionary projects to assess impacts on emergency services and facilities.

Policy 4. Ensure that new development of properties have sufficient access for emergency vehicles and for the evacuation of residents.

Policy 6. All discretionary projects shall comply with the adopted Fire Code and the requirements of the Fire Department.

Implementation Measure

Measure A. Require that all development comply with the requirements of the Kern County Fire Department or other appropriate agency regarding access, fire flows, and fire protection facilities.

Kern County Specific Plans

Kern County has adopted 24 Specific Plans. These Specific Plans are intended to be an amplification of the goals and policies of the KCGP and are, therefore, consistent therewith. The project site is not located wholly or partially within any adopted Specific Plan areas.

Kern County Fire Code

Chapter 17.32 of the Kern County Municipal Code details the Kern County Fire Code, which is an adoption of the 2022 California Fire Code with some amendments. The purpose of the Kern County Fire Code is to regulate the safeguarding of life, property, and public welfare to a reasonable degree from the hazards of fire, hazardous materials release or explosion, or both, due to handling of dangerous and hazardous materials, conditions hazardous to life or property in the occupancy and use of buildings and premises, the operation, installation, construction, and

location of attendant equipment, the installation and maintenance of adequate means of egress, and providing for the issuance of permits and collection of fees.

Kern County Fire Department Strategic Fire Plan

The Kern County Fire Department (KCFD) Strategic Fire Plan adopted in 2021 assesses the wildland fire situation throughout the SRA within the County. The plan includes stakeholder contributions and priorities and identifies strategic targets for pre-fire solutions as defined by the people who live and work within the local fire problem area. The plan provides a comprehensive analysis of fire hazards, assets at risk, and level of services to systematically assess the existing levels of wildland protection services and identifies high-risk and high-value areas that are potential locations for costly and damaging wildfires. Additionally, the plan provides an annual report of unit accomplishments. The plan gives an overview of KCFD battalions and ranks these areas in terms of priority needs as well as identifies the areas of SRA. According to the plan, 69 percent of Kern County areas are within a SRA. The County is broken up into six different Fuel Management Areas: Tehachapi, Western Kern, Northern Kern, Mt. Pinos Communities, Kern River Valley, and Valley. The project site is located within the Western Kern Fuel Management Area (Battalion 2) (KCFD 2021).

4.20.4 Impacts and Mitigation Measures

This section describes the impact analysis relating to wildfires for the proposed project. It describes the methods used to determine the impacts of the project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (that is, avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion, where applicable.

Methodology

Wildfire impacts are considered based on: 1) off-site wildland fires that could result due to the proposed project, and 2) on-site generated combustion that could affect surrounding areas. The project's potential impacts associated with wildfires have been evaluated using a variety of resources, including CAL FIRE maps showing FHSZs, FRAP, and fire history, vegetation data from the Biological Resources Technical Report (Stantec 2023), project location maps, and project characteristics. Using the aforementioned resources and professional judgment, impacts were analyzed according to the California Environmental Quality Act (CEQA) significance criteria described below.

Thresholds of Significance

The Kern County CEQA Implementation Document and Kern County Environmental Checklist identify the following criteria, as established in Appendix G of the CEQA Guidelines, to determine if a project could potentially have a significant impact with respect to wildfires. A project would have a significant impact with respect to wildfires if it would be located in or near SRAs or lands classified as very high FHSZs, and if the project would:

- Substantially impair an adopted emergency response plan or emergency evacuation plan.
- Due to slope, prevailing winds, or other factors, exacerbate wildfire risk, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.
- Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts on the environment.
- Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

Project Impacts

Impact 4.20-1: Substantially Impair an Adopted Emergency Response Plan or Emergency Evacuation Plan.

The project site is classified as being within SRA moderate and high FHSZs. However, the project is not anticipated to physically impede the existing emergency response plans, emergency vehicle access, or personnel access to the site. The site is located in a rural area with a limited population, primarily developed with oil and gas production facilities and agricultural land. The project site is not located along an identified emergency evacuation route and is not identified in any adopted emergency evacuation plan. Also, in compliance with applicable Fire Code and Building Code requirements, construction managers and personnel would be trained in fire prevention and emergency response. Fire suppression equipment specific to construction would be maintained on site. Additionally, project construction would comply with applicable existing codes and ordinances related to the maintenance of mechanical equipment, handling and storage of flammable materials, and cleanup of spills of flammable materials. Therefore, the project would not conflict with the implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan, and impacts would be less than significant.

Mitigation Measures

No mitigation would be required.

Level of Significance

Impacts would be less than significant.

Impact 4.20-2: Due to Slope, Prevailing Winds, and Other Factors, Exacerbate Wildfire Risks, and Thereby Expose Project Occupants to Pollutant Concentrations from a Wildfire or the Uncontrolled Spread of a Wildfire.

Slope and wind speed can influence the spread of fires. Upslope topography eventually increases the spread rate of the fire in all fuel beds over flat conditions (International Journal of Wildland Fire 2010). Elevations across the project site range from 675 feet above mean sea level (amsl) on the western edge down to 550 feet amsl on the eastern edge. The topography of the project area is

relatively flat, interrupted only by oil and gas construction, and slopes gradually from west to east toward the San Joaquin Valley. Once completed, the project would include 10 full-time employees, which would operate the facility seven days a week, 24 hours a day. An additional 10 full-time employees could be on site at any time if repairs or other maintenance work is required. During the years of peak project operation, the project is anticipated to generate approximately 25 average daily vehicle trips per day, assuming 10 employees per day and an average trip rate of 2.5 trips per employee. Furthermore, as described above, the project site is classified as SRA moderate and high FHSZ. The project site is within areas identified by CAL FIRE as having substantial risk. Thus, the potential for wildfire on the project site is considered moderate. However, during construction, the owner/operator would comply with applicable existing codes and ordinances related to the maintenance of mechanical equipment, handling and storage of flammable materials, and cleanup of spills of flammable materials. Given the moderate potential for fire and the lack of permanent occupants, the project is not anticipated to expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of wildfire due to slope, prevailing winds, and other factors. Impacts would be less than significant.

Mitigation Measures

No mitigation would be required.

Level of Significance

Impacts would be less than significant.

Impact 4.20-3: Require the Installation or Maintenance of Associated Infrastructure (Such as Roads, Fuel Breaks, Emergency Water Sources, Power Lines or Other Utilities) that may Exacerbate Fire Risk or that May Result in Temporary or Ongoing Impacts to the Environment.

The project includes establishing and utilizing a temporary construction corridor and temporary storage and laydown areas. The temporary construction corridor right of way, of up to approximately 25 feet in width, would be established along areas of the pipeline route not accessible via established roads or other existing cleared areas to allow for off-road construction equipment and a travel path. Construction of the project would include improvements to existing private access roads to the project site, the dirt access roads to the proposed turbine locations, and the construction of turbine and crane pads. Other construction-related tasks would include the creation of temporary roadways and equipment laydown sites that are not required as part of the ongoing operation of the facility would be reclaimed. Such roads and laydown areas would be restored to their previous condition through hydroseeding. All roads would comply with development requirements for emergency access; therefore, would not exacerbate fire risk that could result in temporary or ongoing impacts on the environment.

Most fires in the dry valley areas are caused by lightning or vehicles. As the project site is located within SRA moderate and high FHSZs, the addition of two new substations and new overhead 115-kilovolt (kV) transmission lines to Aera Energy-owned substations located at the project site would increase wildfire hazards to some degree above baseline conditions. With any electrified

equipment, there is potential for accidental ignition of nearby vegetation, particularly during high fire hazard conditions/times of the year. In accordance with General Order 95, the project proponent would be required to maintain acceptable clearances between the new and reconductored 115 kV power lines and any nearby trees or other vegetation to minimize the risk of the energized lines igniting wildfires. The two proposed substations and new overhead 115 kV transmission lines would be located within the existing Belridge oilfield designated as a moderate or high fire risk, where wildfire hazard would be expected to be high. However, the vegetation would be cleared, and additional mitigation measures would be taken to ensure the risk of fire is not increased. As discussed in Section 4.9 *Hazards and Hazardous Materials*, the Owner/operator shall develop and implement an emergency response plan that contains notification procedures and emergency fire precautions consistent with the California Fire Code and Kern County Fire Code for use during construction, operation, and decommissioning (see Mitigation Measure [MM] 4.9-18 and MM 4.9-19). The Owner/operator shall also restrict the use of chainsaws, chippers, grinders, and torches. If such equipment is required, the site should be equipped with portable or fixed fire extinguishers and/or a water tank (see MM 4.9-20). Implementation of this plan minimizing the use of equipment would ensure that potential impacts related to the installation or maintenance of associated infrastructure are reduced; therefore, impacts would be less than significant.

Mitigation Measures

Implement MM 4.9-18 through MM 4.9-20, provided in Section 4.9, *Hazards and Hazardous Materials*.

Level of Significance after Mitigation

Impacts would be less than significant.

Impact 4.20-4: Expose People or Structures to Significant Risks Including Downslope or Downstream Flooding or Landslides, as a Result of Runoff, Post-Fire Slope Instability, or Drainage Changes.

No alterations to existing on-site drainage patterns are proposed as part of the project. Additionally, as no waters of the United States are present within the project area, the project would apply for a Notice of Non-Applicability (NONA) pursuant to Order WQ 2022-0057-DWQ, Section III.E. If the project does not qualify for a NONA, the project would require implementation of a Stormwater Pollution Prevention Plan, which would include erosion and sediment control best management practices during construction, thereby reducing the potential of erosion and siltation during construction and would control potential flooding events that could occur during construction. The project proposes the construction of Facility Pipelines, Capture Facilities, New Injection and Monitoring Wells, Water Treatment Facilities, and Electrical Transmission and Networks. As discussed in Section 4.10, *Hydrology and Water Quality*, Kern County requires the development of a drainage plan with the site development grading permit, which would manage stormwater and reduce the risk for off-site impacts due to erosion and impacts on water quality, as implemented by MM 4.10-1. Implementation of a drainage plan

would minimize potential increases in runoff and ensure that design measures are implemented to minimize erosion, sedimentation, and flooding on site and off site.

The majority of soil types on site have high infiltration rates and low runoff potential. The southern Sierra Nevada foothills are east of the project, while the Temblor Range of the Southern Coast Range lies to the west. The topography of the project area is relatively flat, interrupted only by oil and gas construction, and slopes gradually from west to east toward the San Joaquin Valley. Based on the fire history immediately surrounding the site, soil types, and surface hydrology, there is a low potential for the project site to be at risk of post-fire slope instability or drainage changes. While the project would introduce new structures to the project site, measures would be taken to ensure the structures would not exacerbate any fire risks. Therefore, the project would not expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. Impacts would be less than significant.

Mitigation Measures

Implementation of MM 4.10-1, provided in Section 4.10, *Hydrology and Water Quality*.

Level of Significance after Mitigation

Impacts would be less than significant.

4.20.5 Cumulative Setting, Impacts, and Mitigation Measures

Cumulative Setting

Due to the proposed project's location within an existing oil and gas field, the impacts of the project together with the impacts of past, present, and reasonably foreseeable future oil and gas development including wells and abandonment activity to implement carbon capture and storage projects constitute cumulative impacts. The County has prepared an EIR evaluating the potential impacts (including contributions to cumulative impacts) of oil and gas development in connection with previously proposed amendments to the Kern County Zoning Ordinance: *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting*, certified on November 9, 2015, supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR (SREIR) certified on March 8, 2021; and an addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"). The Oil and Gas EIR is referenced in this EIR as a source of information regarding cumulative impacts from oil and gas development that were not disputed in the most recent litigation before the Court of Appeal. However, this EIR does not rely on the Oil and Gas EIR for purposes of tiered review under CEQA (Guidelines Section 15152). The information in these documents provides evidence for the record of the analysis of cumulative impacts of the disturbance, construction activities, and operation of the wells and abandonment activities as projected in the Oil and Gas EIR.

The aforementioned documents provide a projection of future production in the entire oilfield over 25 years of 3,649 new wells countywide per year of various types (production, water disposal,

water flood injectors, idle wells, non-cyclic, observation wells, steam flood injectors, air injection and gas disposal) (pages 3-37 and 3-38 SREIR 2020/2021) and an additional 5,066 other wells (cyclic wells, Senate Bill [SB] 4 Activities, plugged and abandoned) per year (page 3-38 SREIR 2020/2021). The 25-year span from 2015 to 2040 has run for 8 years. In the County permitting years (2016, 2017, 2018, 2019, 2020, 2021, and 2022), the average number of permits in all categories has been 1,600 permits per year. In addition, the State of California regulatory authorities stopped issuing any SB 4 permits (projected to be 1,200 per year) since February 2021. The California Department of Conservation Geologic Energy Management Division permitting for all wells with the exception of plugging and abandonments has never averaged over 2,000 permits a year (as implementation in some years of the County permits) since 2019. The analysis in the documents is, therefore, a very conservative impact review of cumulative impacts.

The geographic scope for cumulative impacts of wildfire is the Belridge oilfields. Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects*, would have on wildfire. This geographic scope of analysis is appropriate because wildfire impacts within this area are expected to be similar to those in the project site because of their proximity; similar environments, landforms, and hydrology would result in similar land use and site types.

Impact 4.20-5: Contribute to Cumulative Wildfire Impacts

With regard to impacts on wildfire, the project has the potential to contribute significantly to cumulative impacts within the region. A complete analysis of the various ground-disturbing activities from oil and gas is provided in Section 4.20, *Wildfire* (Final Oil and Gas EIR – 2015). Through the implementation of MM 4.9-18 through MM 4.9-20, and MM 4.10-1, direct impacts on wildfire would be reduced to less than significant.

With regard to the impairment of an adopted emergency response plan or emergency evacuation plan, all of the cumulative projects would be required to provide adequate emergency access in accordance with County Fire Code and Building Code requirements (or similar codes/requirements in accordance with the applicable jurisdiction within Los Angeles County) and prior to the issuance of a building permit. As previously discussed, the project site is not located along an identified emergency evacuation route or within an adopted emergency evacuation plan, and would be in compliance with Fire Code and Building Code requirements including fire prevention and emergency response training for site personnel. As concluded in the discussion of project impacts above, the project would have a less than significant impact related to the impairment of an adopted emergency response or evacuation plan. Similar to the project, cumulative projects would be required to determine whether they are classified as within a high FHSZ, identified within an emergency evacuation route or within an adopted emergency evacuation plan, and whether they meet the requirements of applicable Fire Code and Building Code. Therefore, the project and cumulative projects are expected to result in a less than significant cumulative impact on an adopted emergency response plan or emergency evacuation plan.

With regard to cumulative impacts related to the exposure of project occupants to pollutant concentrations from a wildfire, the proposed project is within SRA moderate and high FHSZs, and some cumulative projects in the area may be as well. Similar to the proposed project, all cumulative projects would be required to implement building and landscape design features in accordance with the Fire Code and Building Code to reduce wildfire risk and exposure of occupants to pollutant concentrations from a wildfire. Adherence to the Fire Code and Building Code requirements would minimize potential impacts related to exposure to and the uncontrolled spread of a wildfire. As concluded in the discussion of project impacts above, the project would have a less-than-significant impact related to the exposure of project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. Therefore, the project and cumulative projects are expected to result in a less than significant cumulative impact related to the exposure of project occupants to pollutant concentrations from a wildfire.

Cumulative projects may require associated infrastructure such as roads, fuel breaks, and power lines that could exacerbate fire risk or that may result in temporary or ongoing impacts on the environment. These projects would be reviewed by Kern County (or the applicable jurisdiction within Los Angeles County) for land use and zoning consistency and compliance with applicable requirements, and analyzed for environmental impacts. The placement of infrastructure would adhere to all fire codes to minimize the potential fire risk such as siting and design. The project includes establishing and using a temporary construction corridor and temporary storage and laydown areas. MM 4.9-18 through MM 4.9-20 would be implemented to ensure that measures would be taken to not exacerbate any fire risks, such as complying with Kern County Fire Codes and maintaining firefighting apparatus and supplies required by the KCFD. Additionally, the project Owner/operator shall prepare an emergency incident response plan that addresses Kern County Fire and Kern County Sheriff notification and protocols for incident management. Therefore, the project and cumulative projects are expected to result in a less than significant cumulative impact related to the installation or maintenance of associated infrastructure.

Some cumulative projects could be proposed in areas that could expose people or structures to risks from downslope or downstream flooding or landslides as a result of post-fire slope instability. Based on the recent fire events in California, all projects would be required to adhere to Kern County's zoning and land use designations and codes (or those of the applicable jurisdiction within Los Angeles County), State and local fire codes, and regulations associated with drainage and site stability. These regulations, policies, and codes would reduce the potential for exposing people or structures to risks from downslope or downstream flooding or landslides as a result of post-fire slope instability. Each project would require site-specific hydrology and drainage studies for effective drainage design. As concluded in the discussion of project impacts above, with the implementation of MM 4.10-1, the project would not expose people or structures to significant risks due to post-fire slope instability or drainage changes and would have a less-than-significant impact. Therefore, the project and cumulative projects are expected to result in a less than significant cumulative impact related to exposing people or structures to significant risks as a result of runoff, post-fire slope instability, or drainage changes.

Mitigation Measures

Implementation of MM 4.9-18, MM 4.9-19, MM 4.9-20, and MM 4.10-1.

Level of Significance after Mitigation

Cumulative impacts would be less than significant.

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Chapter 5

Consequences of Project Implementation

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Chapter 5
Consequences of Project Implementation

5.1 Environmental Effects Found to Be Less Than Significant

According to Section 15128 of the California Environmental Quality Act (CEQA) Guidelines, an Environmental Impact Report (EIR) must "contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR."

This contents of this EIR for the proposed Aera CarbonFrontier Project (project) were established based on the Notice of Preparation/Initial Study (NOP/IS) located in Appendix A. Based on the findings of the NOP/IS and the results of scoping, Kern County has determined that this EIR must include a detailed analysis of all environmental issues identified in Appendix G of the CEQA Guidelines. This analysis is included in Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures*, of this EIR.

After further study and environmental review, as documented in this EIR, direct, indirect, and cumulative impacts of the project would be less than significant or could be reduced to less than significant levels with mitigation measures for the following issue areas:

- Hazards and Hazardous Materials
- Land Use and Planning
- Population and Housing
- Public Services
- Recreation
- Transportation and Traffic
- Tribal Cultural Resources
- Wildfire

5.2 Significant Environmental Effects That Cannot Be Avoided

Section 15126.2(b) of the CEQA Guidelines requires EIRs to describe any significant impacts, including those that can be mitigated but not reduced to less than significant levels. Potential environmental effects of the proposed project and proposed mitigation measures are discussed in detail in Chapter 4 of this EIR.

As shown in **Table 5-1**, impacts in the following areas would be significant and unavoidable, even with the incorporation of feasible mitigation measures.

Table 5.2-1: Summary of Significant and Unavoidable Impacts of the Project

Resources	Project Impacts	Cumulative Impacts
Aesthetics	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on aesthetic and visual resources. Even with mitigation, the project has the potential to contribute to cumulative impacts within the region with the additions of the injection wells, monitoring wells, and capture facilities equipment. The cumulative impacts of the project when combined with other known and unknown projects are **cumulatively significant and unavoidable**. All reasonable and feasible mitigation measures have been evaluated and included.
Agricultural Resources	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on agricultural resources. Based on the countywide loss of agricultural land due to the Groundwater Sustainability Act, reduction in water for agricultural use, drought conditions, and urban growth patterns, the loss is considered cumulatively considerable. The cumulative impacts of the project when combined with other known and unknown projects are **cumulatively significant and unavoidable**. All reasonable and feasible mitigation measures have been evaluated and included.

Table 5.2-1: Summary of Significant and Unavoidable Impacts of the Project

Resources	Project Impacts	Cumulative Impacts
Air Quality	The project's total emissions would exceed the San Joaquin Valley Air Pollution Control District thresholds for NO_X, PM_{10}, and $PM_{2.5}$, for which the project region is nonattainment under an applicable federal or State ambient air quality standard. The project would expose sensitive receptors to substantial pollutant concentrations. With the implementation of Mitigation Measure (MM) 4.3-1 through MM 4.3-9, the impact would remain **significant and unavoidable.**	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on air quality resources. Because the project's specific emissions would contribute to Kern County's 2020 emissions inventory and to the 2025 projected emissions of Kern County, the project's incremental effects on air quality would be cumulatively considerable and, even with mitigation, this potentially significant cumulative impact would be **cumulatively significant and unavoidable**. All reasonable and feasible mitigation measures have been evaluated and included.
Biological Resources	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on biological resources. Although the cumulative impacts from carbon capture and storage (CCS) projects would be less due to the CCS Surface Land Use restrictions, other clean energy projects that are sited in the valley portion of Kern County have the potential to impact species and reduce habitats. The cumulative impacts of the project when combined with other known and unknown projects are **cumulatively significant and unavoidable**. All reasonable and feasible mitigation measures have been evaluated and included.
Cultural Resources	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on cultural resources. Given the depths needed for the Underground Injection Control Class IV injection wells, the potential for destruction of unknown cultural resources is possible. Given the size and scope of oil and gas activities in the unincorporated area, and the impacts of this project at depths where cultural resources cannot be assessed cumulative impacts to cultural resources are considered cumulatively considerable. The cumulative impacts of the project when combined with other known and unknown projects are **cumulatively significant and unavoidable**. All reasonable and feasible mitigation measures have been evaluated and included.
Energy	There would be no significant and	The project, in combination with other existing or reasonably foreseeable projects, could result

Table 5.2-1: Summary of Significant and Unavoidable Impacts of the Project

Resources	Project Impacts	Cumulative Impacts
	unavoidable project impacts.	in cumulative impacts on energy resources. The cumulative impacts on the regional grid, which have not been determined to meet the CARB 2045 goals for production, are **cumulatively significant and unavoidable** after all feasible and reasonable mitigation.
Geology and Soils	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on geologic resources. Due to the uncertainty of the implementation of multiple projects and the ability to simultaneously cease injection during a seismic event, the impacts from cumulative induced seismic activity from this project plus any future permitted CCS project are **cumulatively significant and unavoidable**. All reasonable and feasible mitigation measures have been evaluated and included.
Greenhouse Gases	The project has the potential to generate greenhouse gas emissions, either directly or indirectly, which may have a significant impact on the environment and conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. With the implementation of MM 4.8-1 and MM 4.8-2, the impact would remain **significant and unavoidable**.	The geographic scope for cumulative impacts for GHGs for the project is the San Joaquin Valley Air Basin. Climate change impacts are inherently global and cumulative, and not project specific. While implementation of MM 4.8-1 and MM 4.8-2 would encourage reduction in GHG emissions at a regional level, they do not provide a mechanism that guarantees GHG emission reductions on a cumulative basis. The project's cumulative contribution to GHG emissions after implementation of the recommended mitigation measures would remain **cumulatively significant and unavoidable**.
Hydrology and Water Quality	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on groundwater supply. As the Kern County subbasin is currently over drafted and the West Kern Water District's Groundwater Sustainability Plan has been deemed inadequate, along with the other Kern subbasin plans where the other similar known and unknown projects could occur, the cumulative impacts of any use of groundwater in the area are considered **cumulatively significant and unavoidable** after all feasible and reasonable mitigation.
Mineral Resources	The project could result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on mineral resources. The loss of oil reservoir as part of the project is

Table 5.2-1: Summary of Significant and Unavoidable Impacts of the Project

Resources	Project Impacts	Cumulative Impacts
	State. The loss of oil reservoir in the project area is considered a significant loss of oil, which is considered a mineral of value to the State. No feasible mitigation measures are proposed, and impacts would remain **significant and unavoidable**.	considered a significant loss of mineral resources. No feasible mitigation measures are proposed, and impacts would remain **cumulatively significant and unavoidable**.
Noise	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on noise. Project activities would have to implement MM 4.13-1 if there are sensitive human noise receptors within 4,000 feet of a well to ensure that the noise levels do not exceed 65 dBa. Potentially significant cumulative noise impacts could occur even if noise levels associated project activities plus surrounding oil and gas activities are under 65 dBA, depending on the location of another nearby project, its noise levels, and the distance to a sensitive noise receptor. The project's cumulative contribution to noise impacts after implementation of the recommended mitigation measures would remain **cumulatively significant and unavoidable**.
Utilities and Service Systems	There would be no significant and unavoidable project impacts.	The project, in combination with other existing or reasonably foreseeable projects, could result in cumulative impacts on utilities and service systems in regard to groundwater supply. As the Kern County subbasin is currently over drafted and the West Kern Water District's Groundwater Sustainability Plan has been deemed inadequate, along with the other Kern subbasin plans where the other similar known and unknown projects could occur, the cumulative impacts of any use of groundwater in the area are considered **cumulatively significant and unavoidable** after all feasible and reasonable mitigation.

Key:
CARB = California Air Resources Board
CCS = carbon capture and storage
GHG = greenhouse gas
MM = mitigation measure
NO_X = oxides of nitrogen
State = State of California

5.3 Irreversible Impacts

Section 15126.2(c) of the CEQA Guidelines defines an irreversible impact as an impact that uses nonrenewable resources during the initial and continued phases of the project. Irreversible impacts can also result from damage caused by environmental accidents associated with a project. Irretrievable commitments of resources should be evaluated to ensure that such consumption is justified.

Build-out of the project would commit nonrenewable resources during project construction. During project operations, oil, gas, and other fossil fuels and nonrenewable resources would be consumed, primarily in the form of transportation fuel for project employees. Therefore, an irreversible commitment of nonrenewable resources would occur as a result of long-term project operations. However, assuming that those commitments occur in accordance with the adopted goals, policies, and implementation measures of the Kern County General Plan (KCGP), as a matter of public policy, those commitments have been determined to be acceptable. The KCGP ensures that any irreversible environmental changes associated with those commitments would be minimized, to the extent feasible.

5.4 Significant Cumulative Impacts

According to Section 15355 of the CEQA Guidelines, the term cumulative impacts "refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." Individual effects that may contribute to a cumulative impact may result from a single project or a number of separate projects. Individually, the impacts of a project may be relatively minor, but when considered along with impacts of other closely related or nearby projects, including newly proposed projects, the effects could be cumulatively considerable.

This EIR considers the potential cumulative effects of the proposed project. Impacts for the following issue areas have been found to be cumulatively considerable:

- Aesthetics
- Agricultural Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology and Soils
- Greenhouse Gases
- Hydrology and Water Quality (groundwater supply)

- Mineral Resources
- Noise
- Utilities and Service Systems (water supply)

Each of these significant cumulative impacts is discussed in the applicable section of Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures*, of this EIR.

5.5 Growth Inducement

The KCGP recognizes that certain forms of growth are beneficial, both economically and socially. Section 15126.2(d) of the CEQA Guidelines provides the following guidance on growth-inducing impacts: a project is identified as growth inducing if it "could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment."

Growth inducement can be a result of new development that requires an increase in employment levels, removes barriers to development, or provides resources that lead to secondary growth. With respect to employment, the project would not induce substantial growth. Construction staff that are not local would likely be housed in existing communities. Project operations would include 10 regular full-time employees. It is expected that some of these individuals would already reside in the area and operations of the project would not result in a substantial influx of people (such as a new residential development, school, or other use that would result in large volumes of people residing near or traveling to the project site). Therefore, the project is not likely to induce any growth within Kern County.

5.6 Energy Conservation

To ensure that energy implications are considered in project decisions, CEQA requires that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy (see Public Resources Code section 21100(b)(3)). According to Appendix F of the CEQA Guidelines, the goal of conserving energy implies the wise and efficient use of energy, including the following:

- Decreasing overall per capita energy consumption
- Decreasing reliance on natural gas and oil
- Increasing reliance on renewable energy sources

As discussed in Section 4.6, *Energy*, during construction of the project, energy resources would be consumed in the form of diesel and gasoline fuel from the use of off-road equipment and on-road vehicles. Temporary electricity may be required to provide as-necessary lighting and electric equipment. The amount of electricity used during construction would be minimal. Natural gas is not anticipated to be required during construction of the project. Overall, construction activities

associated with the proposed project would result in the consumption of petroleum-based fuels. However, there are no unusual project characteristics that would necessitate the use of construction equipment or vehicles that would be less energy efficient than at comparable construction sites in other parts of the State of California (State). Therefore, it is expected that construction fuel consumption associated with the proposed project would not be any more inefficient, wasteful, or unnecessary than at other construction sites in the region.

During operation, most on-site equipment (for example, pumps, maintenance, monitoring, communications) for the pre-combustion oilfield gas would be powered by electricity from the on-site co-generation facility and supplemented by Pacific Gas and Electric (PG&E), as needed. Although the project would result in increased demand for energy resources, the energy would be consumed efficiently and would be typical of the current state of industrial carbon capture projects. Projections of energy use described in Section 4.6, *Energy*, for the total electricity needed for the project, are based on the current technology (amine) and do not represent the newer forms of carbon capture, which include conservation measures to reduce the electric demand. Therefore, the projections are conservative and would be lower when other sources are permitted for injection into the project. As the State phases out oilfield extraction and related gas and replaces gas power plants and fossil fuel industry sources with newer carbon capture facilities and renewable energy sources such as solar (required for many forms of financing), the project would meet the requirements of Appendix F of the CEQA Guidelines.

Based on this analysis, the project would consume energy resources during construction and operations. Implementation of the project would support industrial operations that use renewable energy, decrease reliance on fossil fuels, including natural gas, and become more efficient in the use of electricity. The State's policies outlined in Senate Bill 905, and the ban on enhanced oil recovery with CO_2, ensures that the goals of Appendix F in sources for the injection would be more efficient.

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Chapter 6

Alternatives

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Chapter 6

Alternatives

6.1 Introduction

The California Environmental Quality Act (CEQA) requires that an Environmental Impact Report (EIR) describe a range of reasonable alternatives to the project or to the location of the project site that could feasibly avoid or lessen any significant environmental impacts of the project while attaining most of the project's basic objectives. An EIR also must compare and evaluate the environmental effects and comparative merits of the alternatives. This chapter describes alternatives considered but eliminated from further consideration, including the reasons for elimination, and compares the environmental impacts of several alternatives retained with those of the Aera CarbonFrontier Project (project).

The following are key provisions of the CEQA Guidelines (Section 15126.6):

- The discussion of alternatives shall focus on alternatives to the project or its location that are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives or would be more costly.
- The No Project Alternative shall be evaluated, along with its impacts. The No Project analysis shall discuss the existing conditions at the time the notice of preparation was published, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.
- The range of alternatives required in an EIR is governed by a "rule of reason;" therefore, the EIR must evaluate only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to those that would avoid or substantially lessen any of the significant effects of the project.
- For alternative locations, only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR.
- An EIR need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote and speculative.

The range of feasible alternatives is selected and discussed in a manner to foster meaningful public participation and informed decision making. Among the factors that may be taken into account when addressing the feasibility of alternatives, as described in Section 15126.6(f)(1) of the CEQA Guidelines, are environmental impacts, site suitability, economic viability, availability of infrastructure, general plan consistency, regulatory limitations, jurisdictional boundaries, and whether the project proponent could reasonably acquire, control, or otherwise have access to an

alternative site. An EIR need not consider an alternative whose effects could not be reasonably identified, whose implementation is remote or speculative, and that would not achieve the basic project objectives.

Per the CEQA Guidelines, this section discusses alternatives that are capable of avoiding or substantially lessening the project's potentially significant environmental effects. Section 6.2, *Summary of Project Impacts Relevant to Evaluation of Alternatives*, summarizes the significant project impacts relevant to this EIR's evaluation of project alternatives. Following this summary, Section 6.3, *Project Objectives*, restates California Resources Corporation's (project proponent's) project objectives. Section 6.4, *Process Used to Develop/Screen Alternatives* summarizes the process used to screen alternatives. Section 6.5, *Overview of the Proposed Project*, summarizes project features. Section 6.6, *Overview of Alternatives to the Project*, provides an overview of the alternatives. Section 6.7, *Alternatives Eliminated from Further Consideration*, presents alternatives to the project that were considered but eliminated for further analysis. Section 6.8, *Alternatives to the Project*, presents alternatives fully analyzed in this EIR and provides a comparison of each alternative's environmental effects to those of the project. Section 6.9, *Comparative Impacts of Project to All Alternatives*, sets forth a table that summarizes the relative impacts of all of the alternatives as compared to the project. Section 6.10, *Environmentally Superior Alternative*, makes a determination about the environmentally superior alternative analyzed in this EIR.

6.2 Summary of Project Impacts Relevant to Evaluation of Alternatives

Potentially significant adverse environmental impacts that would result from the project are evaluated in Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures*. The mitigation measures and impact conclusions are summarized in Chapter 1, *Executive Summary*, which includes a summary chart of impact conclusions for all topic areas. This EIR concludes that the project has the potential to cause significant environmental impacts in the following categories:

- Aesthetics (cumulative)
- Agriculture and Forest Resources (cumulative)
- Air Quality (project and cumulative)
- Biological Resources (cumulative)
- Cultural Resources (cumulative)
- Energy Resources (cumulative)
- Geology and Soils (cumulative – seismic activity)
- Greenhouse Gas Emissions (project and cumulative)

- Hydrology and Water Quality (cumulative – groundwater supply)
- Mineral Resources (project and cumulative)
- Noise (cumulative)
- Utilities and Service Systems (cumulative – water supply)

The significant and unavoidable impacts of the proposed project are discussed below.

6.2.1 Aesthetics and Visual Resources

As explained in Section 4.1, *Aesthetics and Visual Resources*, with regard to impacts on visual resources, the project has the potential to contribute significantly to cumulative impacts within the region. Moreover, due to the project's proposed location within an existing oil and gas field, the impacts of the project together with the impacts of past, present, and reasonably foreseeable future oil and gas development, including wells and abandonment activity to implement carbon capture and storage projects, constitute cumulative impacts. However, because there are no scenic vistas or Designated State Scenic Highways within the project area, the proposed project would have a less than significant impact on these resources. Additionally, with mitigation, the project would not degrade existing visual characteristics or the quality of the site and its surroundings. With mitigation, the project would also not create new sources of lighting that would adversely affect nighttime views in the area. Overall, even with mitigation, the project's contribution to significant impacts associated with visual character and quality in the project area would be cumulatively significant and unavoidable.

6.2.2 Agricultural Resources

As explained in Section 4.2, *Agricultural Resources*, with regard to impacts on significant agriculture and forest resources, the project has the potential to contribute significantly to cumulative impacts within the region. Moreover, even with mitigation, the project would have a significant and unavoidable impact with respect to its potential to contribute to the cumulative conversion of farmland due to the importance of the region's agricultural resources. However, with mitigation, the project would have a less than significant impact related to conflicts with the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) to non-agricultural use. Additionally, the project would have a less than significant impact related to conflicts with Williamson Act contracts, conflicts with forest land zoning, forestland conversion, and cancellation to an open space contract within Kern County. Overall, the project's incremental effects on agricultural resources would be cumulatively considerable and, even with mitigation, this potentially significant cumulative impact would be significant and unavoidable.

6.2.3 Air Quality

As explained in Section 4.3, *Air Quality*, with regard to significant impacts on air quality, the project has the potential to contribute significantly to cumulative impacts within the region. Moreover, the project's specific emissions would contribute to Kern County's 2020 emissions inventory and to the 2025 projected emissions of Kern County. However, with mitigation, the project would have a less than significant impact related to conflicts with the adopted regulatory programs incorporated within the San Joaquin Valley Air Pollution Control District's ozone and particulate matter attainment plans. The project would have a significant unavoidable impact regarding a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under applicable federal or state ambient air quality standards. With mitigation, the project would have a less than significant impact regarding exposure of sensitive receptors to substantial pollutant concentrations. Overall, the project's incremental effects on air quality would be cumulatively considerable, and, even with mitigation, this potentially significant cumulative impact would be significant and unavoidable.

6.2.4 Biological Resources

As explained in Section 4.4, *Biological Resources*, with mitigation, the project's potential to have a direct or indirect adverse effect on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations or by wildlife agencies would be less than significant. Also, with mitigation, the project's potential to have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by wildlife agencies would be less than significant. The project's potential to have a substantial adverse effect on federally protected wetlands through direct removal, filing, hydrological interruption, or other means would be less than significant with mitigation. Likewise, with mitigation, the project would not interfere substantially with the movement of any native resident or migratory wildlife species or with established native resident or migratory wildlife corridors or impede the use of wildlife nursery sites. The project would not conflict with any local policies or ordinances protecting biological resources, such as tree preservation policies or ordinances. Moreover, any adverse impacts related to the project's potential to conflict with the provisions of a habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan would be mitigated to a less than significant level. However, the project would make a cumulatively considerable contribution to cumulative biological resource impacts, even with mitigation.

6.2.5 Cultural Resources

As explained in Section 4.5, *Cultural Resources*, with mitigation, the project would have a less than significant impact with respect to its potential to cause a substantial adverse change in the significance of a historic resource. Similarly, with implementation of mitigation measures described in Section 4.5, the project would have a less than significant impact with respect to its potential to cause a substantial adverse change in the significance of an archaeological resource. Moreover, with mitigation, the project would have a less than significant impact with respect to its

potential to directly or indirectly destroy a unique paleontological resource, site, or feature. With mitigation, the project would also have a less than significant impact with respect to its potential to disturb any human remains. However, even with mitigation, the project would make a cumulatively considerable contribution to impacts regarding historic, archaeological, or human remains, and such impact is significant and unavoidable.

6.2.6 Energy Resources

As explained in section 4.6, *Energy*, the project would have a less than significant impact with respect to its potential to cause a substantial environmental impact due to an unnecessary consumption of energy. The project would also not significantly conflict with or obstruct state or local plans for renewable energy or energy efficiency. However, due to the project's proposed location within an existing oil and gas field, the impacts of the project together with the impacts of past, present and reasonably foreseeable future oil and gas development including wells and abandonment activity to implement carbon capture and storage projects constitute cumulative impacts. Therefore, even with mitigation, the project has the potential to contribute significantly to cumulative impacts within the study area.

6.2.7 Geology and Soils

As explained in Section 4.7, *Geology and Soils*, with mitigation, the project would have a less than significant impact regarding its potential to cause substantial adverse effects due to the rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, or landslides. With mitigation, the project would also have a less than significant impact regarding the potential to result in substantial soil erosion or loss of topsoil, nor be located on expansive soil or a geologic unit or soil that is unstable or could become unstable due to the project. The project would further have no impact regarding the project's ability to support the use of septic tanks or alternative wastewater disposal systems because the project would not include the development of septic systems or alternative wastewater disposal systems. With mitigation, the project would also have a less than significant impact regarding its potential to destroy unique paleontological resources, sites, or unique geologic features as defined by CEQA guidelines Section 15064. However, due to the uncertainty of the implementation of multiple projects and the ability to simultaneously cease injection during an event, the impacts from cumulative induced seismic activity from this project plus any future permitted carbon capture and storage (CCS) project is significant and unavoidable even with mitigation.

6.2.8 Greenhouse Gas Emissions

As explained in Section 4.8, *Greenhouse Gas Emissions*, the project's potential adverse effects related to direct and indirect greenhouse gas (GHG) emissions would be mitigated to less than significant levels. However, the project would conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHG, thus causing a significant and unavoidable impact, even with mitigation. Finally, the project would make a cumulatively

considerable contribution to a cumulative GHG emissions impact, even with mitigation, and this impact is therefore significant and unavoidable.

6.2.9 Hydrology and Water Quality

As explained in Section 4.10, *Hydrology and Water Quality*, the project's potential to substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of a groundwater basin would be less than significant with mitigation. In addition, the project's potential to conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan would be less than significant with mitigation. The project also would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. And, with mitigation, the project will not substantially alter existing drainage patterns or place housing in flood hazard areas. Nor would the project expose people or structures to flooding risks with implementation. However, the project's potential cumulative hydrology and water quality (groundwater supply only) impacts would be significant and unavoidable with mitigation.

6.2.10 Mineral Resources

As explained in Section 4.12, *Mineral Resources*, the project's impact with respect to its potential to result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state would be significant and unavoidable. Additionally, the project's impact with respect to its potential to result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, Specific Plan, or other land use plan would be significant and unavoidable with mitigation. Finally, the project's potential cumulative mineral resource impacts would be significant and unavoidable.

6.2.11 Noise

As explained in Section 4.13, *Noise*, the project's potential to generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies would be less than significant with mitigation. Additionally, the project's potential to expose persons to, or generate, excessive ground-borne vibration or ground-borne noise levels would be less than significant and does not require mitigation. The project is also not located within two miles of a public airport or private airstrip and thus would not expose people residing or working in the project area to excessive noise levels. However, the project's cumulative noise impacts would be significant and unavoidable with mitigation.

6.2.12 Utilities and Service Systems

As explained in Section 4.19, *Utilities and Service Systems*, with mitigation, the project's potential to require or result in the relocation or construction of new or expanded wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction

or relocation of which could cause significant environmental effects, would be less than significant. Additionally, with mitigation, the project would have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years and impacts would be less than significant. Because the project would not generate a significant amount of wastewater from operations, the potential for the project to result in a determination by the wastewater service provider that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments would be less than significant.

With mitigation, the project's potential to generate solid waste in excess of state or local standards, or in excess of local infrastructure, or otherwise impair the attainment of solid waste reduction goals would be less than significant as well. Implementation of mitigation along with compliance with applicable statutes and regulations would also ensure compliance with policies to reduce waste sent to landfills, reducing impacts to less than significant. In regard to cumulative impacts, the project could result in significant impacts on utilities and service systems relative to water supply. As the Kern County subbasin is currently over drafted and the West Kern Water District's Groundwater Sustainability Plan has been deemed inadequate, along with the other Kern subbasin plans where the other similar known and unknown projects could occur, the cumulative impacts of any use of groundwater in the area are considered cumulatively significant and unavoidable after all feasible and reasonable mitigation.

6.3 Project Objectives

The project proponent has defined the following objectives for the project:

- Construct and operate facilities and infrastructure to capture, transport, inject, and permanently store up to 40 million metric tons of CO_2 in a safe, secure, and economically feasible manner for storage, not enhanced recovery
- Minimize new disturbance by siting and designing project facilities and infrastructure within the existing developed oilfield footprint, consistent with current Kern County and California guidelines
- Reduce the carbon intensity of Aera Energy's produced oil and gas by capturing CO_2 from produced gas (pre-combustion) and stationary sources (post-combustion)
- Generate environmental, social, and economic benefits for Kern County and the State of California by implementing low carbon technologies, developing CCS infrastructure, and providing living-wage jobs in the region
- Contribute to California's goal to achieve carbon neutrality by 2045 (Executive Order B-55-18) by integrating carbon capture in existing operations as well as ending oil and gas production from select reservoirs and repurposing them for the permanent storage of CO_2

6.4 Process Used to Develop/Screen Alternatives

The alternatives to the project analyzed in this EIR were selected through a two-step process. First, the County identified potential alternatives based on the comments it received during the EIR scoping process and though internal deliberations that took into consideration the overall project objectives. Then, the County screened out those alternatives that it determined would not meet most of the project objectives, were infeasible, would not substantially reduce any of the project's significant environmental effects, or were not otherwise reasonable or realistic. Third, the County identified those alternatives that passed the screening criteria and that represent a range of available options to carry forward for analysis in this chapter.

6.5 Overview of the Proposed Project

The proposed Aera CarbonFrontier Project (project) is the consideration of the approval of a Zone Change Case (ZCC No. 4, Map No 51, ZCC No. 3, Map No. 74, and ZCC No. 4, Map No. 75) from A-1 (Limited Agriculture) to A (Exclusive Agriculture) on approximately 1,737 acres and from A/NR (Natural Resources – 20-acre minimum) to A (Exclusive Agriculture) on approximately 47 acres and approval of Conditional Use Permits (CUP) (CUP No. 9, Map No. 51, CUP No. 7, Map No. 74, CUP No. 7, Map No. 75, CUP No. 9, Map No. 96, CUP No. 10, Map No. 51, CUP No. 9, Map No. 74, CUP No. 11, Map No. 75) for the construction and operation of an approximately 12,362-acre CCS facility with related capture facilities and pipeline for carbon dioxide (CO_2) captured from existing sources within the South Belridge oilfield.

The project site is located within the Central Valley portion of unincorporated Kern County and is comprised of 45 parcels within the administrative boundaries of the North and South Belridge oilfields.

Aera Energy proposes to construct and operate a CCS facility on approximately 12,362 acres of privately owned land. CCS facilities would be composed of four carbon dioxide (CO_2) locations of collection: one pre-combustion and three post-combustion sources; up to nine Class VI underground injection control (UIC) wells; up to eight monitoring wells; approximately 14.7 miles of CO_2 facility pipelines; and the CCS Surface Land Area associated with a Storage Space capable of storing up to 40 million metric tons (MMT) of CO_2. None of the CO_2 captured will be used for enhanced oil recovery.

The source of CO_2 for injection as part of this project would be the pre-combustion (Pre-C) produced field gas stream from South Belridge oilfield and post-combustion (Post-C) flue gas. In addition to Aera internal sources of CO_2, the project would have the capacity to receive CO_2 from outside sources.

The proposed CCS project would capture CO_2 from an initial source of existing produced gas streams (pre-combustion) and emissions from existing stationary sources (post-combustion) within the South Belridge oilfield and transport the CO_2 through a facility pipeline to the North Belridge oilfield for injection at up to nine dedicated Class VI UIC wells. The proposed CO_2 underground

Storage Space, which is approximately 2,290 acres in size (maximum modeled CO_2 plume area), would be located within the North Belridge oilfield within the CCS Surface Land Area rights held by Aera Energy and other private owners. Oil and gas production activities would cease within the underground geologic formation where CO_2 would be stored, prior to commencement of the project.

The proposed project at full operation would be designed to store up to roughly 3.3 MMT per year of concentrated CO_2 in the Storage Space (referred to as the 64 Zone reservoir) in the North Belridge oilfield, beginning in 2027 for approximately 20 years, with a total storage capacity of up to 40 MMT of CO_2. In addition to internal sources of CO_2, the project would have capacity to import CO_2 from outside sources. The project is proposed to be permitted to store up to 3.3 MMT per year. The project would support California's goal of carbon neutrality by 2045 and net negative emissions thereafter (Governor's Executive Order B-55-18) by reducing industrial CO_2 emissions. The proposed CCS facilities, pipelines, Class VI UIC wells, and monitoring wells would be located within the CUP boundary (see Figure 3-1 Vicinity Map). The proposed project includes the following components:

- **CO_2 Capture Facilities.** One pre-combustion capture facility and three post-combustion capture facilities.
- **Pipelines.** An approximately 10-mile, 6- to 12-inch main aboveground CO_2 facility pipeline, and approximately 4.7 miles of CO_2 distribution facility pipelines extending from the main facility pipeline to each injection well, would be constructed. Approximately 6.5 miles of produced gas lines, up to 4.5 miles of potential water line routes, and approximately 10 miles of steam line routes, would also be constructed.
- **Wells.** Construction and operation of up to nine Class VI injection wells, of which five existing wells would be converted, and four new wells would be developed. Up to eight existing wells would be converted for monitoring of the injected CO_2. Up to 40 existing oil wells would be plugged and abandoned within the North Belridge oilfield. Prior to plugging, one existing well would have a fiberoptic cable installed that, in conjunction with the California Integrated Seismic Network, would be used to monitor seismic activity at the site. Additionally, up to 40 existing wells, previously abandoned within the North Belridge oilfield, would be re-abandoned to meet current State and federal plugging requirements and 21 operational production wells would be plugged and abandoned within the proposed CCS facility areas in South Belridge.
- **Access Roads.** Maintenance and repair of existing field access roads.
- **Water Systems.** Construction of water treatment facilities at each of the CO_2 capture facilities for treatment of produced water.
- **Electrical Transmission/Substations.** Construction of approximately 6,840 feet of 115 kV overhead transmission lines from the existing Aera Energy-owned electrical supply grid to two new electrical substations located adjacent to the CO_2 capture facilities.
- **Networks.** Electrical power distribution, and supervisory control and data acquisition networks.

6.6 Overview of Alternatives to the Project

Under CEQA, and as indicated in California Public Resources Code Section 21002.1(a), the identification and analysis of alternatives to a project is a fundamental aspect of the environmental review process and is required to ensure the consideration of ways to mitigate or avoid the significant environmental effects of a project. Based on the significant environmental impacts of the proposed project, the aforementioned objectives established for the proposed project, and the feasibility of the alternatives considered, two alternatives, including the No Project Alternative as required by CEQA, are considered in this chapter and summarized in Table 6-1. The Environmentally Superior Alternative, as required by CEQA, is described in Section 6.10, *Environmentally Superior Alternative*, below.

6.7 Alternatives Eliminated from Further Consideration

Kern County considered several alternatives to reduce the project's significant and unavoidable impacts. Per CEQA, the lead agency may make an initial determination as to which alternatives are feasible and warrant further consideration, and which are infeasible. The following alternatives were initially considered but were eliminated from further consideration in this EIR because they do not meet project objectives and/or were infeasible.

6.7.1 Drilling Ban on All Lands "Leave It in the Ground" Alternative

A drilling ban on all land would implement a "leave it in the ground" alternative. This alternative extends beyond denying or modifying the project to a policy decision to amend Chapter 19.98 the Zoning Ordinance to prohibit all oil and gas exploration, development, and production activities within the project area. Further, it would require that existing oil and gas wells and all facilities relying on that production and being considered for the CCS project would be required to cease, and all affected land would be required to be restored to its pre-exploration condition. This alternative assumes that the ban extends to the UIC Class VI wells needed for injection as well. An alternative where another source, not related to fossil fuel production, is used for the CCS project, such as direct air capture (DAC), is analyzed in Section 6.8.2, below. This alternative is outside the scope of the privately funded project under consideration and does not meet three out of the five project objectives. Further the environmental impacts of construction activities to remove and restore land utilized for oil and gas exploration, extraction and production by the industry in Kern County, encompassing over 596,199 acres for just the administrative oilfield, would exceed all the thresholds and project specific impacts of this project in all categories. Alternatives are required by CEQA to reduce one or more impacts that are significant and unavoidable to less than significant.

While the production of various criteria pollutants and CO_2 from the use of the fuel would be reduced, the reduction would be offset from the remediation activities. In addition to failing to meet most of the project objectives, an alternative that completely bans all new oil and gas exploration,

development, and production activities is infeasible due to existing legal restrictions on the County's authority to prohibit access to subsurface mineral interests without liability. Since the Drilling Ban on All Lands Alternative is legally infeasible and would not achieve most of the project's basic objectives, as well as being beyond the scope of the project and this EIR, it is rejected for analysis in this EIR.

6.7.2 Off-site Alternative

The Off-site Alternative would carry out the project in a different location, outside of the San Joaquin Valley Air Basin. The project site, however, was selected because of its proximity to the location of oil and gas resources and infrastructure within the County. As explained in Chapter 3, *Project Description*, the project area was selected because it encompasses the portion of the County in which oil and gas development has historically occurred as the process of CCS involves capturing carbon from existing point sources within an existing oil and gas field and storing it underground (for example, in a depleted oil and gas reservoir).

Furthermore, the selection of the project site was predicated upon the capacity of the pre-existing infrastructure to effectively fulfill the project's objectives while limiting the impact to surrounding land use. All new CCS facilities, including wells, pipelines and ancillary infrastructure, would be operated in areas in which oil and gas activity is currently the primary land use and therefore a compatible land use. There are also no established residential communities within or adjacent to the project area.

The alternative would place the CCS facility outside the San Joaquin Valley Air Basin to reduce the determination of significant and unavoidable for air impacts on air quality based on higher thresholds. The Mojave Air Basin, while in attainment for a number of criteria pollutants and therefore with higher thresholds, has no oil and gas production and therefore has no underground pore space suitable for a CCS project. Thus, this alternative is technically infeasible and therefore, it is rejected for analysis.

It should also be noted that, while CEQA requires an EIR to identify project alternatives, it does not require the EIR to identify alternative project locations. Per the CEQA Guidelines, an EIR must include a reasonable range of "alternatives to the project, *or* to the location of the project" (14 California Code of Regulations. Section 15126.6(a) [emphasis added]). Applicable case law recognizes that CEQA grants lead agencies flexibility to elect to analyze either onsite or off-site alternatives, or both (see Mira Mar Mobile Community v. City of Oceanside, 119 Cal. App. 4th 447, 491 [2004]). There is no requirement under CEQA that an EIR always explore an off-site alternative (see California Native Plant Society v. City of Santa Cruz, 177 Cal. App. 4th 957, 933 [2009]). Thus, CEQA does not require this EIR to analyze the Off-site Alternative.

6.8 Alternatives to the Project

Alternatives that would avoid or substantially lessen any of the significant effects of the project and feasibly attain most of the basic project objectives are evaluated in Sections 6.8.1 through 6.8.3,

below. The alternatives are discussed with respect to their relationship to the project's objectives. Kern County has considered the following two alternatives, which are also identified in Table 6-1 and discussed individually below:

- Alternative 1 – No Project Alternative
- Alternative 2 – Initial Source - Direct Air Capture Alternative
- Alternative 3 – Nature Based Carbon Storage Alternative

6.8.1 Alternative 1: No Project Alternative

As required by CEQA Guideline §15126.6, this chapter describes and analyzes a "no project" alternative for the purpose of comparing the impacts of approving the project with the impacts of not approving the project. Alternative 1, the No Project Alternative, thus assumes that the project's 12,362-acre CCS facility consisting of U.S. Environmental Protection Agency Class VI UIC wells, 14.5 miles of underground facility pipelines, and related infrastructure improvements for the capture, transfer, and storage of CO_2 would not be approved or constructed. Accordingly, Alternative 1 assumes that the necessary approval of multiple CUPs to allow for the construction and operation of the CCS underground site installation of one (1) pre-combustion and three (3) post-combustion sources, up to nine (9) Class VI injection wells, up to eight (8) monitoring wells, and construction of accessory infrastructure with a CO_2 storage capacity of 40 MMT; and related changes in zoning from A-1 (Limited Agriculture) to A (Exclusive Agriculture) and from NR to A (Exclusive Agriculture) would not be approved for project construction and operation.

Moreover, the No Project Alternative would not result in up to 40 MMT of concentrated CO_2 storage capacity. Additionally, the No Project Alternative would not support California's Executive Order B-55-18, for California to achieve carbon neutrality by 2045 and net negative emissions thereafter.

Finally, the No Project Alternative would maintain the current zoning, land use classifications, and existing land uses, which consist mostly of existing oil and gas exploration and production, including existing well pads, processing facilities, pipeline routes, and access roads, along with undeveloped desert vegetation. The project site would continue to be utilized for oil and gas extraction. The identified wells on schedule for abandonment under the project would not be abandoned early and would instead be abandoned on the eight-year idle well plan regulations.

Environmental Impact Analysis

Aesthetics

Under the No Project Alternative, no development would take place on the project site. The project site would remain in its current state as an operational oil and gas field, and no change to the scenic vistas or existing visual character of the site would occur. Impacts to scenic resources and daytime and nighttime views in the area would not occur. The No Project Alternative would result in less impact to aesthetics as compared to the proposed project.

Agricultural Resources

Under the No Project Alternative, the project site would remain as an operational oil and gas field. The project site would remain in its current state, containing, wells, pipelines and ancillary infrastructure. As such, the No Project Alternative would not involve changes to the existing environment which could result in the conversion of Farmland or forest land to non-agricultural or non-forest uses. Therefore, No Project Alternative would result in fewer impacts related to agricultural and forestry resources compared to the proposed project.

Air Quality

Under the No Project Alternative, the project site would remain as an operational oil and gas field, and there would be no new construction activities or new operational activities that would generate new air emissions. The No Project Alternative would not contribute to a cumulative net increase of criteria pollutant in the project's region beyond what presently is attributed to existing operations. Therefore, the No Project Alternative would result in less impacts related to air quality compared to the proposed project.

Biological Resources

Under the No Project Alternative, the project site would remain as an operational oil and gas field and existing biological resources within the project area, including special-status plant and wildlife species, would remain undisturbed, since no construction or operation would occur. The project site would remain in its current state, as an operational oil and gas field land containing desert vegetation and would not contribute to a cumulative loss of foraging and nesting habitat for burrowing owls, Swainson's hawk, loggerhead shrike, other raptors, desert kit fox, and migratory bird species that may utilize habitat on the project site. Therefore, the No Project Alternative would result in less impacts related to biological resources compared to the proposed project.

Cultural Resources

Under the No Project Alternative, the project site would remain as an operational oil and gas field, and no new ground disturbing activities would occur. Therefore, disturbance to potential historical resources, archeological resources, or human remains located on site would not occur, and this alternative would not require mitigation. There would be no impact and the No Project Alternative would result in less impacts related to cultural resources as compared to the proposed project.

Energy

Under the No Project Alternative, the project site would remain as an operational oil and gas field, and no new energy consumption activities would occur beyond what presently is attributed to existing operations. As such, the No Project Alternative would not result in wasteful, inefficient, or unnecessary consumption of energy resources and would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Therefore, both the No Project Alternative and the project would result in less than significant impacts related to energy. Impacts would be similar as compared to the proposed project.

Geology and Soils

Under the No Project Alternative, the project site would remain as an operational oil and gas field, and no new ground disturbance would occur. As such, the No Project Alternative would not directly or indirectly cause potential substantial adverse effects involving rupture of a known earthquake fault or strong seismic ground shaking, result in substantial soil erosion or loss of topsoil, or directly or indirectly destroy a unique paleontological resource or unique geologic feature. Therefore, the No Project Alternative would result in fewer impacts related to geology and soils compared to the proposed project.

Greenhouse Gas Emissions

Under the No Project Alternative, the project site would remain as an operational oil and gas field, and no construction or new operational activities would occur. The Belridge oilfields would continue to emit GHG emissions as a result of ongoing operations. GHG emission reductions resulting from operation of the proposed CCS facility would not be realized. Impacts would be less than significant under this alternative; however, impacts from implementation of this alternative would be greater than those of the project as it would not result in the capture of GHG emissions attributed to the project.

Hazards and Hazardous Materials

Under the No Project Alternative, the project site would remain as an operational oil and gas field, and no construction or new operational activities would occur. The project site would remain in its current condition. This alternative would continue to involve the use, transport, and disposal of hazardous materials associated with the project site; create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Both the project and the No Project Alternative would result in significant impacts relative to the use, transport and disposal of hazardous materials. Therefore, the project and the No Project Alternative would result in similar impacts.

Hydrology and Water Quality

Under the No Project Alternative, the project site's existing hydrology would remain unchanged, as no development or ground disturbance would occur on the project site. As such, this alternative would not violate water quality standards or waste discharge requirements; substantially alter the existing drainage patter of the site or area in a manner that would substantially increase the rate or amount of surface runoff which would result in flooding on site or off site; create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage system; contribute to inundation by a flood hazards, tsunami, or seiche; or conflict with or obstruct implementation of a water quality control plan or groundwater management plan. Therefore, the No Project Alternative would result in less impact related to hydrology and water quality as compared to the proposed project.

Land Use Planning

The No Project Alternative would not develop any new uses at the project site and would thus not require any of the submitted land use applications. Current land uses on the site are consistent with

the zoning and Kern County General Plan land use classifications. The No Project Alternative would not cause a significant environmental impact due to conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. The proposed project also would result in less than significant land use impacts. Impacts relative to Land Use would be similar under the project and the No Project Alternative.

Mineral Resources

Under the No Project Alternative, the project site would remain as an operational oil and gas field, and no ground disturbance would occur. There are no mineral resources on the project site or in the project area. As such, the No Project Alternative would not result in the loss of availability of locally important mineral resource recovery site delineated on a local general plan, Specific Plan, or other land use plan. Therefore, the No Project Alternative would result in less impact related to mineral resources compared to the project.

Noise

Under the No Project Alternative, the project site would remain as an operational oil and gas field. New noise sources from construction and operation would not be present on site beyond what is presently attributed to existing operations, and existing noise conditions would remain the same. As such, the No Project Alternative would not result in generation of a substantial temporary or permanent increase in ambient noise levels or generate excessive ground-borne vibration. Therefore, the No Project Alternative and the project would result in less than significant impacts related to noise. Impacts would be similar as compared to the project.

Population and Housing

Under the No Project Alternative, the project would remain as an operational oil and gas field. As such, the No Project Alternative would not result in substantial population growth require the removal or displacement of any residential structures or inhabitants; therefore, no housing would be displaced, and the project would not require construction of replacement housing elsewhere. Because of the rural nature of the project area, no new population or housing resources would be required beyond what is presently attributed to existing operations for either the No Project Alternative or the project. Therefore, the No Project Alternative and the project would result in less than significant impacts related to population and housing. Impacts would be similar as compared to the proposed project.

Recreation

Under the No Project Alternative, the project site would remain as an operational oil and gas field and no new demand for recreational facilities would occur. As such, the No Project Alternative would not increase the use of recreational facilities or require construction or expansion of recreational facilities. Because of the rural nature of the project area, no new recreational resources would be required beyond what is presently attributed to existing operations for either the No Project Alternative or the project. Therefore, the No Project Alternative and the project would result in less than significant impacts related to recreation. Impacts would be similar as compared to the proposed project.

Public Services

Under the No Project Alternative, the project site would remain as an operational oil and gas field and no new demand for fire or police protection services would occur beyond what presently is attributed to existing operations. Furthermore, no new demand for schools, parks, or other government facilities would occur beyond what presently is attributed to existing operations. As such, the No Project Alternative would not result in the need for new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection, police protection, schools, parks, or other government facilities. The project could require increased fire protection and emergency response services, necessitating the construction of new or altered facilities. Therefore, impacts would be less under this Alternative as compared to the proposed project.

Transportation and Traffic

Under the No Project Alternative, the project site would remain as an operational oil and gas field, and no new transportation activities would occur beyond what presently is attributed to existing operations. Existing traffic patterns and volumes on nearby roadways would remain unchanged. As such, the No Project Alternative would not conflict with a program, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities and not conflict or be inconsistent with CEQA Guidelines Section 15064.3(b). In addition, the No Project Alternative would not substantially increase hazards due to a geometric design feature or result in inadequate emergency access. Therefore, both the No Project Alternative and the project would result in less impact related to transportation and traffic. Impacts would be similar as compared to the proposed project.

Tribal Cultural Resources

Under the No Project Alternative, the project site would remain as an operational oil and gas field, and no ground disturbing activities would occur. The No Project Alternative would not involve construction in the vicinity of the aforementioned tribal cultural resources, the No Project Alternative would not cause a substantial adverse change in the significance of a tribal cultural resources with cultural value to a California Native American tribe that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k) or as a resource determined by the lead agency. Therefore, the No Project Alternative would result in less impact related to tribal cultural resource compared to the proposed project.

Utilities and Service Systems

Under the No Project Alternative, the project site would remain as an operational oil and gas field and there would be no new demand for utilities and service systems on the project site. As such, the No Project Alternative would not require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects; impact water supplies; generate solid waste in excess of State or local standards; or conflict with federal, state, and local management and reduction statues and

regulations related to solid waste. The project would result in significant unavoidable water supply impacts. Therefore, the No Project Alternative would result in less impact related to utilities and service systems compared to the proposed project.

Wildfires

Under the No Project Alternative, the project site would remain as an operational oil and gas field and would not exacerbate existing wildfire risks within the area. The CCS project also would not increase wildfire risks. Therefore, the No Project Alternative would result in similar impacts related to wildfires compared to the proposed project.

Comparative Impacts of Alternative 1

The No Project Alternative would avoid creating nearly all of the significant and unavoidable impacts associated with the proposed project. This alternative would result in less impact to all remaining environmental issue areas with the exception of GHGs; since this alternative would not capture GHG emissions through the operation of a CCS facility, impacts to GHGs would be greater under this alternative.

Alternative 1: Relationship to the Project Objectives

The No Project Alternative would not achieve any of the project objectives listed above in Section 6.3, *Project Objectives*, including assisting California in reducing GHG emissions. Although this alternative would create less environmental impacts overall, the objectives that shape the project would not be realized under this alternative.

6.8.2 Alternative 2: Initial Source Direct Air Capture Alternative

Under Alternative 2, the project proponent would not capture the gas from the oilfield as the initial source but instead utilize a DAC system for an unknown location off site to capture atmospheric CO_2 emissions in place of a conventional amine-based capture system. DAC is a technology that captures CO_2 directly from the atmosphere, usually through a mechanical system, although some passive capture techniques are also being developed. In a mechanical system, fans or wind are used to drive ambient air through a contactor unit, where the air passes across a chemical sorbent that selectively reacts with and traps CO_2, allowing the other components of the air to pass through and exit the system. Currently, the most developed adsorbent materials are in liquid or solid forms (Kern County Carbon Management Business Park – Report 2023, Appendix K-2).

DAC is an engineered equivalent to photosynthesizing plants, except that DAC captures CO_2 from the atmosphere at a faster rate and with a much smaller land footprint than biomass (nature-based solutions; refer to Alternative 3). Furthermore, DAC delivers CO_2 in a pure, compressed form. Captured atmospheric CO_2 can be permanently and safely stored in geologic reservoirs to deliver negative emissions or be used to produce low carbon intensity products, such as synthetic fuels that work in existing vehicles and infrastructure.

Current DAC technologies are primarily distinguished by using one of two types of sorbents: liquid solvents (L-DAC) and solid sorbents (S-DAC). In both techniques, DAC pulls air from the atmosphere and passes it over the sorbent material. The sorbent material captures the CO_2, and the rest of the air passes through and exits the DAC unit. L-DAC typically uses hydroxide solutions (a liquid solvent) as the bonding sorbent, whereas S-DAC relies on a CO_2 "filter" or dry amine-based chemical sorbents. In both cases, the CO_2 from the air is chemically bound into a new compound, and then is subsequently broken down to release (1) a high-purity stream of CO_2 for storage, and (2) the original sorbent components for reuse.

Both technologies require electricity and heat to operate; the electricity drives the fans and controls inlet systems, while the heat releases the trapped CO_2. However, S-DAC requires temperatures of only approximately 100 degrees Celsius (°C) to break the chemical bonds linking the CO_2 to the sorbent material, whereas L-DAC requires temperatures around 900 °C. Such temperatures are difficult to reach using renewable energy sources like wind or solar. If natural gas is used to attain the necessary heat, the associated CO_2 released from the use of L-DAC technology would need to be recaptured and stored to avoid counteracting the benefit of DAC.

While the direct land footprint of DAC is smaller than that of alternative carbon-removal processes, it requires renewable energy to operate, which results in large amounts of commercial scale solar. A DAC capable of generating 1 million tons a year of CO_2 for injection would require over 1,600 acres of land (228 MW) of energy. This land use would be in addition to the 12,362 acres required for the carbon capture area.

DAC facilities are expected to produce zero or-near zero emissions onsite that could be hazardous to the environment or human health. Hazardous waste is not a significant concern for DAC facilities.

Wastewater is also not generated in significant amounts in DAC processes, as the only water used is contained within close-loop systems. Some DAC operations actually produce water as part of the process. Solid waste buildup can occur in the CO_2 recovery equipment, as happens in traditional monoethanolamine scrubbers that are used for point source carbon capture. Similar environmental regulation and disposal guidelines would need to be followed. Chemicals used in sorbent plants would degrade over time as heat is applied to release captured CO_2, but those degradation products (for example, ammonia) are expected to be contained within the DAC plant and not released into the environment and have established regulation and disposal protocols.

Liquid DAC (L-DAC) requires approximately 2.8 MWh of energy for every metric ton of CO_2 captured (estimates range from 1.8 to 3.7 MWh per metric ton of CO_2). Each L-DAC contactor unit captures approximately 300 to 600 metric tons per year, and units are modular and stackable. Thus, footprints vary depending on how high units are stacked or how they are spread out. To capture 1 MMT of CO_2 per year, we estimate a facility would require about 200 acres of space. Reported estimates range from 50 to 1,730 acres, depending on how contactor units are arranged.

Like the project, Alternative 2 would amend Zoning Ordinance Chapter 19.98 to rezone from A-1 to A for the project and seek approval of the CCS facility with the initial source of a DAC facility.

This alternative also would require construction of injection and facility pipelines and injection and monitoring wells, same as proposed under the project.

Comparative Impacts of Alternative 2

Installation of a DAC facility would result in impacts similar to those of the proposed project for many issue areas. While the footprint of the DAC facility would likely be larger than the collective footprint of the CCS surface land area capture facilities under the project (amine units, compressors and pumps), the DAC facility could be sited in any location, as the only feedstock is ambient air and need not be tied to point emissions sources. Therefore, the DAC could be sited in such a way that the footprint avoids impacts on sensitive resources within the CCS Surface Land Area, such as biological habitat or archaeological resources. The DAC could also be cited away from sensitive receptors to help preclude visual or noise impacts. The footprint of the required renewable energy, specifically commercial-scale solar, would significantly increase the impacts on biology, cultural and air quality during construction.

Like the project, the Initial Source Air Capture Alternative would result in short-term construction impacts related to air quality, GHG emissions, geology and soils, hydrology and water quality, noise, and traffic.

A DAC facility would result in generally the same operational impacts as the project, as it would require routine inspections and maintenance, requiring a limited number of employees and trips to the project site. Therefore, operational traffic, noise and mobile source air quality impacts would be similar. Other impacts associated with operational characteristics would be similar as well including population and housing, recreation, public services, and utilities.

The Initial Source Air Capture Alternative would result in a substantial reduction in stationary source GHG and air emissions. The Initial Source Air Capture Alternative is independent of any point source generator and therefore, is not dependent on the continued operation of the oil and gas field for an emissions source for capture. The DAC facility would have some energy and water supply demands dependent upon the technology employed but would ultimately result in net negative GHG emissions from the project.

Alternative 2: Relationship to the Project Objectives

Alternative 2 would achieve most of the project objectives. The DAC Alternative would meet objectives 1, 3, 4 and 5 in their entirety. The alternative would, like the project, create a permanent underground storage facility for CO_2, in an economically feasible manner; it would support the State's net zero target for carbon neutrality; it would site and design the project in an environmentally responsible manner; and it would promote economic development in the County. It would not meet objective #2 in that it would be located in an off-site location, the disturbance footprint and impacts of which are unknown.

6.8.3 Alternative 3: Nature Based Carbon Storage Alternative

Alternative 3, the Nature-Based Carbon Storage Alternative, would replace the mechanical capture of CO_2 and storage in the underground oil and gas reservoir rock layer with planting of trees or other type of appropriate crop in order to store atmospheric CO_2. Currently, the proposed project site is located within the North and South Belridge oilfields, existing oil and gas fields where the area characterized by extensive oil and gas exploration and production, including existing well pads, processing facilities, pipeline routes, and access roads. Under this alternative, the project proponent would have to cease and remove all oil and gas exploration and production equipment within the North and South Belridge oilfields and then utilize the area for a nature-based carbon storage alternative. The most applicable nature-based carbon storage alternative for the area of the project site would be regenerative agriculture, as it coincides with the current zoning. Planting of trees would be one example of regenerative nature-based carbon storage for the highest ability to store atmospheric carbon. If 12,000 acres of the project site were remediated of all oil and gas facilities and prepared for planting, an estimated 400 to 1,000 trees per acre could be planted, resulting in a new forest area of 4.8 million to 12 million trees. The type of tree and planting configuration will affect the species selected. Characteristics of the best trees for carbon removal, instead of cover crops include the use of fast-growing trees as they store the most carbon during the first decades of their lifespan and act as carbon sinks, trees with wide crowns and large leaves that are best for efficient photosynthesis and the selection of native tree species that are compatible with local soil and disease-resistant trees that require no fertilizers.

Comparative Impacts of Alternative 3

Soil remediation activities would result in short-term impacts to air quality, and impacts associated with hazardous materials (potential upset and dispersion of contaminated soils), as would project activities. The use of the land for trees would significantly impact landscape based biological resources including native desert habitats; however, there would be other biological contributions to wildlife (nesting raptors) that could outweigh those for other species. The impact on energy would be reduced from those of the project; however, the impacts on water supply would increase.

Alternative 3: Relationship to the Project Objectives

The projected storage capacity of the project is 40 MMT with anticipated sources from hard to decarbonize industries such as concrete, chemical blending and hydrogen. Additionally, CARB has identified CCS as a short-term strategy to decarbonize the use of natural gas power plants until they can be phased out. The storage of CO_2 within trees would have no impact on industrial decarbonization efforts. It would, however, reduce the need for DAC installation and large amounts of land needed for solar production for that use as well as the CCS underground storage space itself and related land use restrictions. The contribution of the nature-based solution over a projected time span to 2045 is not comparable, however, to CCS. As explained in Chapter 3, it is anticipated that the proposed project would capture and store up to 3.3 MMT of CO_2 per year. The higher estimates for vegetive storage via trees projects at 1,000 pounds per tree over 20 years for fast growing trees),

results in an estimate of 1.8 million tons to 4.5 million tons of CO_2 permanently stored in the new forest by 2024 (CARB 2022). The use of the land for nature-based carbon removal, while providing less than significant impacts, would not meet the project objectives or reduce as much CO_2 as the project capacity itself for decarbonizing critical industries such as cement production.

6.9 Comparative Impacts of Project to All Alternatives

A summary of the comparative impacts of the Project to the alternatives analyzed in this EIR is provided in Table 6-1.

Table 6-1: Summary Comparison of Alternative Impacts

Issue Area	Project Summary of Impacts	Alternative 1 No Project Alternative	Alternative 2 Initial Source Direct Air Capture Alternative	Alternative 3 Nature-Based Carbon Storage Alternative
Aesthetics and Visual Resource	Less than significant	Less than project	Greater than project	Less than project
Agricultural and Forest Resources	Less than significant	Less than project	Greater than project	Same as project
Air Quality	Significant and unavoidable	Less than project	Construction: Greater than project Operational: Less than project	Less than project
Biological Resources	Less than significant	Less than project	Greater than project	Same as project
Cultural Resources	Less than significant	Less than project	Greater than project	Same as project
Energy	Less than significant	Same as project	Same as project	Less than project
Geology and Soils	Less than significant	Less than project	Same as project	Less than project
Greenhouse Gas Emissions	Significant and unavoidable	Greater than project	Less than project	Less than project
Hazards and Hazardous Materials	Less than significant	Same as project	Same as project	Same as project
Hydrology and Water Quality	Less than significant	Less than project	Same as project	Less than project
Land Use and Planning	Less than significant	Same as project	Same as project	Same as project
Mineral Resources	Significant and unavoidable	Less than project	Same as the project	Same as the project
Noise	Less than significant	Same as project	Less than project	Less than project
Population and Housing	Less than significant	Same as project	Same as project	Less than project
Public Services	Less than significant	Less than project	Same as project	Less than project
Recreation	Less than significant	Same as project	Same as project	Less than project

Table 6-1: Summary Comparison of Alternative Impacts

Issue Area	Project Summary of Impacts	Alternative 1 No Project Alternative	Alternative 2 Initial Source Direct Air Capture Alternative	Alternative 3 Nature-Based Carbon Storage Alternative
Transportation and Traffic	Less than significant	Same as project	Same as project	Less than project
Tribal Cultural Resources	Less than significant	Less than project	Greater than project	Less than project
Utilities and Service Systems	Less than significant	Less than project	Same as project	Greater than the project (water supply)
Wildfire	Less than significant	Same as project	Same as project	Greater than the project

6.10 Environmentally Superior Alternative

Identification of an environmentally superior alternative is required under CEQA (California Code of Regulation Section 15126.6(e)(2)). Alternative 1, the No Project Alternative would be environmentally superior to the project on the basis of the minimization or avoidance of physical environmental impacts but would have greater impacts than the project for GHG emissions. Section 15126.6(e)(2) of the CEQA Guidelines state that if the No Project Alternative is found to be environmentally superior, "the EIR shall also identify an environmentally superior alternative among the other alternatives." Although Alternative 1 is the environmentally superior alternative in certain issue areas, it is not capable of meeting any of the project objectives. Due to the substantial reduction of impacts from GHG emissions and meeting most of the project objectives, Alternative 2, Initial Source DAC, is considered the environmentally superior alternative.

Alternative 2, Initial Source DAC, reduces the significant and unavoidable GHG emissions impacts of the project and would substantially reduce operational stationary source air emissions. This alternative would have greater impacts on aesthetics, biological resources, cultural resources, noise, and tribal cultural resources than the project would due to the larger footprint. Alternative 2 would continue to have significant and unavoidable impacts on mineral resources, and cumulative effects on agricultural and forest resources, air quality, geological resources, hydrology, and utilities, similar to the project. Although Alternative 1 would have fewer and less severe significant impacts than Alternative 2, Alternative 2 would achieve most of the project's objectives as described above.

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Chapter 7

Response to Comments

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Chapter **7**
Response to Comments

This chapter is reserved for, and will be included in, the Final EIR.

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Chapter 8

Organizations and Persons Consulted

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Chapter 8

Organizations and Persons Consulted

8.1 Federal

Federal Communications Commission

U.S. Bureau of Land Management

U.S. Department of Agriculture

U.S. Environmental Protection Agency Region IX

U.S. Fish and Wildlife Service

8.2 State of California

CAL FIRE

California Air Resources Board

California Department of Conservation

California Department of Fish and Wildlife

California Department of Transportation District 6

California Department of Water Resources

California Energy Commission

California Environmental Protection Agency

California Natural Resources Agency

California Public Utilities Commission

California Regional Water Quality Control Board, Central Valley Region

California State Senate

California State University Bakersfield Library

California Workforce Development Board

Governor's Office of Business and Economic Development

Native American Heritage Council

Office of the State Geologist

Public Policy Institute of California

State Clearinghouse

State Department of Toxic Substance Control

8.3 Regional and Local

Bakersfield City Planning Department

Bakersfield City Public Works Department

Belridge Water Storage District

Building Trades Council

Buttonwillow County Water District

Buttonwillow Union School District

California City Planning Department

California State University Bakersfield

Center for Biological Diversity

Center on Race, Poverty and the Environment

City of Arvin

City of Bakersfield

City of Maricopa

City of McFarland

City of Ridgecrest

City of Shafter

City of Taft

City of Tehachapi

City of Wasco

Defenders of Wildlife

Delano City Planning Department

Employers' Training Resource

Greater Bakersfield Chamber of Commerce

Inyo County Planning Department

Kern Audubon Society

Kern Citizens for Energy

Kern Community College District

Kern Council of Governments

Kern County Agricultural Department

Kern County Environmental Health Services Department

Kern County Farm Bureau

Kern County Fire Department

Kern County Library

Kern County Parks and Recreation

Kern County Public Works Department

Kern County Sheriff's Department

Kern County Superintendent of Schools

Kern County Water Agency

Kings County Planning Agency

Kern High School District

Laborers' International Union of North America

Leadership Council for Justice & Accountability

Livermore Lab Foundation

Local Agency Formation Comm/LAFCO

Los Angeles Audubon

Los Angeles Co Regional Planning Department

Lost Hills Union School District

McKittrick School District

North West Kern Resource Conservation District

Pacific Gas and Electric Company

Rosedale-Rio Bravo Water District

San Bernardino Co Planning Department

San Joaquin Valley Air Pollution Control District

San Luis Obispo Co Planning Department

San Manuel Band of Mission Indians

Santa Barbara Co Resource Management Department

Sierra Club, Kern Kaweah Chapter

Southern California Gas Company

South San Joaquin Valley Arch Info Center

Taft City School District

Tejon Indian Tribe

Torres Martinez Desert Cahuilla Indians

Tulare County Planning and Development Department

Twenty-Nine Palms Band of Mission Indians

U.S. Bureau of Land Management

Pacific Gas & Electric Co.

Sierra Club/Kern Kaweah Chapter

Southern California Gas Co.

Ventura County RMA Planning Division

Verizon California, Inc.

Wasco Union High School District

West Side Mosquito Abatement District

West Side Recreation & Parks Department

8.4 Private

Aera

Aera Energy

Adams, Boadwell, Joseph & Cardozo

Baker Hughes

Banuelos, Esaul

Belridge Energy Resources Inc.

Belridge Farms & Packing LLC

Berry Petroleum Company LLC

Bloemer Estate LP

Boadwell, Adams, Joseph & Cardozo

Cather-Herley Oil Company

CIPA

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Dolores Huerta Foundation

Diversified Royalties LTD

E&B Natural Resources Management

E&B Natural Resources Management Corporation

Encompass Capital Advisors LLP

Ensign

Epstein, Susan Levinson LIV TR

Exxon/Mobil Production Company

Gabe Pattee

GE Energy

Golden Gate University School of Law

Halliburton

Hathaway, LLC

IOPA

International Brotherhood of Electrical Workers

JB Energy Partners

Jenkins, Richard & Kathleen Family Trust

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Kern Economic Development Corporation

Kern Enterprises LLC

Kern Oil and Refining

Key Energy Services, Inc.

LINN Energy, LLC

Lozeau Drury LLP

Lundin Weber Co LLC

Macpherson Oil Company

Marahd Prop LLC

Maria Joaquin Basin LLC

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Mobil Oil Corporation

Mt. Poso CoGen Company, LLC

Nabors Completion and Production

Naftex Operating Company

O Donnell Oil & Securities Company

Oryx Energy Company

QK Inc

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San Joaquin Refining

San Pablo Bay Pipeline Company

Schlumberger Oilfield Services

Sentinel Peak Resources Cal LLC

Seneca Resources Corporation

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Stanford University

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Still Properties Inc.

Sturgeon Services Int'l

Torrance Valley Pipeline Co LLC

Total Western

Tricor Refining, LLC

Valley Ag Holding LLC

Venco, Inc.

Ventage Production California

WSPA

Wheeler Robenson A & Jacquelyn

WZI, Inc.

Weatherford Completions

Wonderful Citrus LLC

Wonderful Nut Orchards LLC

West American Energy Corporation

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Chapter 9

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Chapter 9

List of Preparers

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Chapter 10

Bibliography

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Chapter 10
Bibliography

4.1 Aesthetics and Visual Resources

California Department of Transportation (Caltrans). 2019. California State Scenic Highway System Map. Accessed January 2024. https://www.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa

California Department of Transportation (Caltrans). 2024. "California State Scenic Highways." Accessed January 2024. https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways

Kern County. 2015. *Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting.* Certified November 9, 2015.

Kern County. 2024. Interactive County Map (GIS Tool). Interactive County Map (GIS Tool) | Kern County, CA. Accessed January 2024.

National Parks Service (NPS). 2019. The National Trails System Act. Accessed October 2023. https://www.nps.gov/subjects/nationaltrailssystem/upload/National-Trails-System-Act-Amended-2019.pdf

Topozone. 2024. Kern County, California Topograhic Maps by Topo Zone. Accessed January 2024. https://www.topozone.com/california/kern-ca/

4.2 Agriculture and Forestry Resources

California Department of Conservation (DOC). 2004. "Farmland Mapping & Monitoring Program." Accessed January 2024. https://www.conservation.ca.gov/dlrp/fmmp

California Department of Conservation (DOC). 2017. State of California Williamson Act Contract Land. Division of Land Resource Protection. Accessed February 2024. https://planning.lacity.gov/eir/HollywoodCenter/Deir/ELDP/(E)%20Initial%20Study/Initial%20Study/Attachment%20B%20References/California%20Department%20of%20Conservation%20Williamson%20Map%202016.pdfCalifornia Department of Conservation (DOC). 2022. "California Williamson Act Enrollment." Accessed January 2024. https://gis.conservation.ca.gov/portal/home/item.html?id=aed46e5566a244fdafc8b276fb3fa791

California Department of Preservation, 2024. Williamson Act Contracts. Accessed February 2024. https://www.conservation.ca.gov/dlrp/wa/Pages/contracts.aspx#:~:text=An%20agricultural%20preserve%20defines%20the,least%20100%20acres%20in%20size.

Kern County Department of Agriculture. 2022. 2021 Kern County Agricultural Crop Report. Accessed February 2024. http://www.kernag.com/dept/news/2022/2021_Kern_County_Crop_Report.pdf

Kern County Planning and Natural Resources Department. 2022. Kern County General Plan/Housing Element Annual Report.

Kern County Planning and Natural Resources Department, 2023. Kern County Subvention Report.

Kern County Council of Governments (COG). 2022. 2022 Regional Transportation Plan/Sustainable Community Strategy. Accessed January 2024. https://www.kerncog.org/wp-content/uploads/2022/12/2022_RTP.pdf

Natural Resources Conservation Service (NRCS). 2024. Farmland Protection Policy Act. Accessed January 2024. https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/land/cropland/farmland-protection-policy-act

U.S. Department of Agriculture. 2024. Forest Service Map. Accessed January 2024. https://www.fs.usda.gov/ivm/

4.3 Air Quality

American Lung Association. 2015. "Ozone." Accessed January 2024. http://www.lung.org/healthy-air/outdoor/resources/ozone.html

California Air Resources Board (CARB). 2007. Final Regulation Order: Regulation for In-Use Off-Road Diesel Vehicles. Accessed January 2024. http://www.arb.ca.gov/regact/2007/ordiesl07/frooal.pdf

California Air Resources Board (CARB). 2009. *California Almanac of Emissions and Air Quality – 2009 Edition*. Accessed January 2024. http://www.arb.ca.gov/aqd/almanac/almanac09/chap509.htm

California Air Resources Board (CARB). 2014. "AB 2588 Air Toxics 'Hot Spots.'" Accessed January 2024. http://www.arb.ca.gov/ab2588/ab2588.htm

California Air Resources Board (CARB). 2015. "Airborne Toxic Control Measures." Accessed January 2024. http://www.arb.ca.gov/toxics/atcm/atcm.htm

California Air Resources Board (CARB). 2016. "Ambient Air Quality Standards." Accessed January 2024. https://ww2.arb.ca.gov/sites/default/files/2020-07/aaqs2.pdf

California Air Resources Board (CARB). 2019. *Update on the 2018 PM2.5 SIP for the San Joaquin Valley*. Accessed December 2023. https://www.valleyair.org/pmplans/documents/CARB-Board-2018-PM2.5-Plan-Update.pdf

California Air Resources Board (CARB). 2020a. *Review of the San Joaquin Valley Air Pollution Control District Emission Reduction Credit System. June 2020.* January 2024. https://ww2.arb.ca.gov/sites/default/files/2020-06/SJV_ERC_FINAL_20200604.pdf

California Air Resources Board (CARB). 2020b. Public Meeting to Consider the California Air Resources Board Review of the San Joaquin Valley Air Pollution Control District Emission Reduction Credit Program. Resolution 20-11. June 26, 2020. Agenda Item No.: 20-6-6. Accessed January 2024.

California Department of Health and Safety (CDPH). 2022. Epidemiologic Summary of Valley Fever (*Coccidioidomycosis*) In California. Access June 23, 2024. https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/CocciEpiSummary2022.pdf

California Office of Environmental Health Hazard Assessment (OEHHA). 2002. *Health Effects of Diesel Exhaust.* Accessed December 2023. https://oehha.ca.gov/media/downloads/calenviroscreen/indicators/diesel4-02.pdf

Faloona, I., S. Conley, M. Suard, A. Post, and J. Trousdell. 2015. *Quantifying the Impacts of Transboundary Ozone to the San Joaquin Valley Surface.* Transboundary Ozone Pollution Conference, Tenaya Lodge, March 31 – April 2, 2015. Accessed January 2024. http://www.valleyair.org/topc/documents/presentations/Ian-Faloona.pdf

Hector, R.F., and R. Laniado-Laborin. 2005. "Coccidioidomycosis—A Fungal Disease of the Americas." *PLoS Medicine*. January 2(1): e2. Accessed January 2024. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC545195

Kern County Planning Department (KCPD). 2006. *Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Reports*. Accessed January 2024. http://www.co.kern.ca.us/planning/pdfs/AirQualityAssessmentpreparationGuidelines.pdf

Kern County Public Health Services (KCPHS). 2014. "Kern County Valley Fever Cases by Selected Measure." Accessed January 2024. http://kerncountyvalleyfever.com/cases-in-kern-county-2/

Los Angeles County Department of Health Services, Public Health. 2004. "Coccidioidomycosis: Cases of Valley Fever on the Rise in Southern California." *The Public's Health Newsletter for Medical Professionals in Los Angeles County.* 4(3). Accessed January 2024. http://www.publichealth.lacounty.gov/media/tph/TPHApril2004.pdf

Mathews, W. 2022. *Failure Investigation Report - Denbury Gulf Coast Pipelines, LLC – Pipeline Rupture/Natural Force Damage.*

National Pesticide Information Center. 2010. *Para-dichlorobenzene General Fact Sheet*. Accessed January 2024. http://npic.orst.edu/factsheets/PDBgen.pdf

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2002. *Guide for Assessing and Mitigating Air Quality Impacts.* Accessed January 2024. https://www.valleyair.org/transportation/CEQA%20Rules/GAMAQI Jan 2002 Rev.pdf

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2005. *Rule 9510 Indirect Source Review*. Accessed January 2024. https://www.valleyair.org/rules/currntrules/r9510.pdf

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2008. *Permit-Exempt Equipment Registration - Frequently Asked Questions*. Accessed January 2024. https://www.valleyair.org/busind/pto/PEER/Documents/PEER FAQ 9-2-08.pdf

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2013. *Report to the Community.* 2012–13 Edition. Accessed January 2024. http://www.valleyair.org/2012-13AnnualReport.pdf

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2015. *Final Draft Guidance for Assessing and Mitigating Air Quality Impacts - 2015*. Accessed November 2023. https://www.valleyair.org/transportation/GAMAQI.pdf

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2016. *2016 Ozone Plan for the 2008 8-Hour Ozone Standard*. Accessed December 2023. https://ww2.valleyair.org/media/ed2f1tdd/adopted-plan.pdf

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2018. *2018 Plan for the 1997, 2006, and 2012 PM2.5 Standards*. Accessed January 2024. https://www.valleyair.org/pmplans/documents/2018/pm-plan-adopted/2018-Plan-for-the-1997-2006-and-2012-PM2.5-Standards.pdf

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2020. Memorandum from Samir Sheikh, Executive Director/APCO Project Coordinator: Morgan Lambert to SJVUAPCD Governing Board. Re: Item Number 13: Update on District Response to California Air Resources Board's Review of the District Emission Reduction Credit System.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2022. *2022 Air Monitoring Network Plan.* Accessed November 2023. https://www.valleyair.org/aqinfo/Docs/2022-Air-Monitoring-Network-Plan.pdf

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2023a. "San Joaquin Valley Attainment Status." Accessed November 2023. https://ww2.valleyair.org/air-quality-information/ambient-air-quality-standards-valley-attainmnet-status/

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2024. Air Toxics 2023 Annual Report. Accessed January 2024. https://ww2.valleyair.org/media/okihp5dy/2023-annual-report.pdf

San Joaquin Valley Air Pollution Control District (SJVAPCD). No date. "Ozone Plans." Accessed January 2024. http://valleyair.org/Air_Quality_Plans/Ozone_Plans.htm

Sonoma Technology. 2006. *The Central California Ozone Study.* California Energy Commission, Public Interest Energy Research Program. Accessed January 2024. http://www.energy.ca.gov/2006publications/CEC-500-2006-087/CEC-500-2006-087-APB.PDF

South Coast Air Quality Management District. 2006. *Overview of the South Coast Air Management District.*

Trinity Consultants. 2023. Air Quality Impact Analysis. CarbonFrontier Project Aera Energy LLC. December 2023.

U.S. Environmental Protection Agency (EPA). 1994. "Chemicals in the Environment: Perchloroethylene." Environmental Protection Agency, Office of Pollution Prevention and Toxics. Accessed January 2024. http://www.epa.gov/chemfact/f_perchl.txt

U.S. Environmental Protection Agency (EPA). 2023a. "NAAQS Table." Accessed November 17, 2023. https://www.epa.gov/criteria-air-pollutants/naaqs-table

U.S. Environmental Protection Agency (EPA). 2023b. "Nitrogen Dioxide (NO_2) Pollution." Accessed https://www.epa.gov/no2-pollution

U.S. Environmental Protection Agency (EPA). 2023c. "Particulate Matter (PM) Pollution." Accessed December 7, 2023. https://www.epa.gov/pm-pollution

U.S. Environmental Protection Agency (EPA). 2023d. "Sulfur Dioxide (SO_2) Pollution." Accessed December 7, 2023. https://www.epa.gov/so2-pollution

Western Regional Climate Center (WRCC). 2023a. "Climate of California." Accessed November 2023. https://wrcc.dri.edu/Climate/narrative_ca.php

Western Regional Climate Center (WRCC). 2023b. "Buttonwillow, California, Period of Record Monthly Climate Summary, 1/05/1901 to 6/10/2016." Accessed November 2023. https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca1244

4.4 Biological Resources

California Regional Water Quality Control Board (RWQCB), Central Valley Region. 2018. Water Quality Control Plan for the Tulare Lake Basin. Third Edition. Accessed July 2023. https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/tularelakebp_201805.pdf

California Fish and Wildlife. 2009. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. Accessed October 2023.

file:///C:/Users/USBW738695/Downloads/6_Appendix_C_Protocols_for_Surveying_and_Evaluating_Plants.pdf.

California Department of Fish and Game (CDFG). 2012. Staff Report on Burrowing Owl Mitigation. Accessed October 2023. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83843.

California Fish and Wildlife. 2022. "CDFW Seeks Information Related to Temblor Legless Lizard." Accessed October 2023. https://wildlife.ca.gov/News/Archive/cdfw-seeks-information-related-to-temblor-legless-lizard#gsc.tab=0

Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Sacramento: California Department of Fish and Game. Accessed November 2023. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=7673

Lichvar, R.W., and S.M. McColley. 2008. A Field Guide to the Identification of the Ordinary High-Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual. Hanover, NH: U.S. Army Corps of Engineers. Accessed October 2023. https://www.spk.usace.army.mil/Portals/12/documents/regulatory/pdf/Ordinary_High_Watermark_Manual_Aug_2008.pdf

U.S. Army Corps of Engineers (USACE). 2005. Regulatory Guidance Letter No. 05-05: Ordinary High Water Mark Identification. Accessed October 2023. https://www.nap.usace.army.mil/Portals/39/docs/regulatory/rgls/rgl05-05.pdf

U.S. Department of the Interior and the U.S. Fish and Wildlife Service. 2022. "Permits for Incidental Take of Eagles and Eagle Nests." Federal Register. 87 (227): 72957–72958. Accessed October 2023. https://www.federalregister.gov/documents/2022/11/28/2022-25837/permits-for-incidental-take-of-eagles-and-eagle-nests

U.S. Environmental Protection Agency. 2023. "Revising the Definition of 'Waters of the United States.'" Accessed October 2023. https://www.epa.gov/wotus/revising-definition-waters-united-states

U.S. Fish and Wildlife Service (USFWS). 2011. Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance.

U.S. Fish and Wildlife Service. 2014. "Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Proposed Rule." Federal Register, Volume 79 Issue 234. Accessed October 2023. https://www.fws.gov/policy/library/2014/2014-28536.html

U.S. Fish and Wildlife Service. 2016. Eagle Permits; Revisions to Regulations for Eagle Incidental Take and Take of Eagle Nests. Accessed October 2023.

https://www.federalregister.gov/documents/2016/12/16/2016-29908/eagle-permits-revisions-to-regulations-for-eagle-incidental-take-and-take-of-eagle-nests

U.S. Fish and Wildlife Service. 2022. "U.S. Fish and Wildlife Service Proposes Improvements To Incidental Take Permit Process for Bald and Golden Eagles." Accessed October 2023. https://www.fws.gov/press-release/2022-09/service-proposes-improvements-incidental-take-permit-process-eagles

Williams, D.F., E.A Cypher, P.A Kelly, K.J. Miller, N. Norvell, S.E. Phillips, C.D. Johnson, and G.W. Colliver. 1998. Recovery Plan for Upland Species of the San Joaquin Valley, California. Portland, OR: U.S. Fish and Wildlife Service. Accessed October 2023. https://esrp.csustan.edu/publications/recoveryplan.php

4.5 Cultural Resources

Allan and Lallicata. 2012. *The Belridge Giant Oil Field - 100 Years of History and a Look to a Bright Future*.

4.6 Energy

California Air Resources Board (CARB). 2018a. "Low Carbon Fuel Standard 2018 Amendments." Accessed September 5, 2023. https://dof.ca.gov/wp-content/uploads/Forecasting/Economics/Documents/LCFS_SRIA_CARB_11-16-17.pdf.

California Air Resources Board (CARB). 2018b. "Carbon Capture and Sequestration Protocol under the Low Carbon Fuel Standard." Accessed September 1, 2023. https://ww2.arb.ca.gov/sites/default/files/2020-03/CCS_Protocol_Under_LCFS_8-13-18_ada.pdf.

California Air Resources Board (CARB). 2022. *2022 Scoping Plan for Achieving Carbon Neutrality*. November 16, 2022. Accessed August 31, 2023. https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf.

California Air Resources Board (CARB). 2023. "Amendments to the In-Use Off-Road Diesel-Fueled Fleets Regulation." Accessed September 1, 2023. https://ww2.arb.ca.gov/resources/fact-sheets/fact-sheet-added-vehicle-restrictions-and-tier-phase-out-requirements.

California Energy Commission (CEC). 2016a. "Electricity Consumption by County." Accessed May 30, 2023. http://www.ecdms.energy.ca.gov/elecbycounty.aspx.

California Energy Commission (CEC). 2016b. "Gas Consumption by County." Accessed May 30, 2023. http://www.ecdms.energy.ca.gov/gasbycounty.aspx.

California Energy Commission (CEC). 2022. "New Data Indicates California Remains Ahead of Clean Electricity Goals" Accessed September 1, 2023, https://www.energy.ca.gov/news/2022-02/new-data-indicates-california-remains-ahead-clean-electricity-goals.

California Energy Commission (CEC). 2022. "2022 Integrated Energy Policy Report Update." Accessed July 5, 2023. https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2022-integrated-energy-policy-report-update.

California Energy Commission (CEC). 2023. "2021 Power Content Label, Pacific Gas and Electric Company." Accessed July 18, 2023. https://www.energy.ca.gov/filebrowser/download/4653.

California Public Utilities Commission (CPUC). 2021. "Renewables Portfolio Standard (RPS) Program." Accessed May 30, 2023. https://www.cpuc.ca.gov/rps.

Kern County Planning Department. 2009. *Kern County General Plan*. Accessed May 30, 2023. https://kernplanning.com/planning/planning-documents/general-plans-elements/.

National Highway Traffic Safety Administration (NHTSA). *2020. Final Environmental Impact Statement for the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Year 2021 – 2026 Passenger Cars and Light Trucks*. Accessed May 30, 2023. https://www.nhtsa.gov/sites/nhtsa.gov/files/documents/safe_vehicles_rule_feis.pdf.

National Highway Traffic Safety Administration (NHTSA). 2022. "Corporate Average Fuel Economy." Accessed July 2023. https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy#40466.

Pacific Gas and Electric (PG&E). 2023. "Company Profile." Accessed May 30, 2023. https://www.pge.com/en/about/company-information/company-profile.html

Ruettgers & Schuler Civil Engineers (Ruettgers & Schuler). 2023. Trip Generation and Vehicle Miles Traveled Analysis for Proposed CRC Terra Vault Project in Elk Hills.

Trinity Environmental Consultants, Inc. (Trinity) 2023. Air Quality Impact Analysis Carbon TerraVault 1 Carbon Capture and Sequestration Project California Resources Corporation. November 2023.

U.S. Energy Information Administration (USEIA). 2023. "California State Profile and Energy Estimates, Profile Overview, California Energy Consumption Estimates, 2021." Accessed September 5, 2023. https://www.eia.gov/state/index.php?sid=CA#tabs-1.

U.S. Environmental Protection Agency (EPA). 2023. "EPA Marks One Year of Progress Under President Biden's Inflation Reduction Act." Accessed August 31, 2023. https://www.epa.gov/newsreleases/epa-marks-one-year-progress-under-president-bidens-inflation-reduction-act.

4.7 Geology and Soils

Burkett, E.R., D.D. Given, and L.M. Jones. 2014. ShakeAlert—An Earthquake Early Warning System for the United States West Coast. Accessed December 2023. https://pubs.usgs.gov/fs/2014/3083/pdf/fs2014-3083.pdf

California Council of Science and Technology (CCST). 2014. Advanced Well Stimulation Technologies in California. Lawrence Berkeley National Laboratory and Pacific Institute. Accessed December 2023. http://ccst.us/publications/2014/2014wst.pdf

National Academy of Sciences (NAS). 2013. Induced Seismicity Potential in Energy Technologies. Accessed December 2023. http://www.nap.edu/openbook.php?record_id=13355

Stantec Consulting Services Inc. (Stantec). 2023a. *Desktop Geohazards and Geotechnical Assessment*. July 2023.

Stantec. 2023b. *Paleontological Resource Assessment*. June 2023.

Stark, A.M. 2020. "New Lab Report Outlines Ways California Could Reach Goal of Becoming Carbon Neutral by 2045." Accessed December 2023. https://www.llnl.gov/article/46046/new-lab-report-outlines-ways-california-could-reach-goal-becomingcarbon-neutral-2045

U.S. (USGS). 2023. Quaternary Fault and Fold Database of the United States. Accessed December 2023. https://www.usgs.gov/programs/earthquake-hazards/faults

4.8 Greenhouse Gas Emissions

California Air Resources Board (CARB). 2018. Carbon Capture and Sequestration Protocol under the Low Carbon Fuel Standard. August. Accessed December 7, 2023. https://ww2.arb.ca.gov/sites/default/files/2020-03/CCS_Protocol_Under_LCFS_8-13-18_ada.pdf

California Air Resources Board (CARB). 2022a. California Greenhouse Gas Emissions for 2000 to 2020: Trends of Emissions and Other Indicators. October. Accessed December 7, 2023. https://ww2.arb.ca.gov/sites/default/files//classic/cc/inventory/2000-2020_ghg_inventory_trends.pdf

California Air Resources Board (CARB). 2022b. 2022 Scoping Plan for Achieving Carbon Neutrality. December. Accessed December 7, 2023. https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf

California Environmental Protection Agency, Climate Action Team (CAT). 2006. Climate Action Team Report to Governor Schwarzenegger and the California Legislature. March 2006.

AERA Energy LLC. 2024. County Communication. February 2024.

Kern Council of Governments (KCOG). 2022. 2022 Regional Transportation Plan/Sustainable Communities Strategy. Accessed December 7, 2023. https://www.kerncog.org/wp-content/uploads/2022/12/2022_RTP.pdf

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2008. Climate Change Action Plan. Accessed December 7, 2023. http://www.valleyair.org/Programs/CCAP/CCAP_menu.htm

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2009. Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA. December. Accessed December 7, 2023. https://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2010a. Best Performance Standard. Components at Light Crude Oil and Natural Gas Production, Natural Gas Processing Facilities, Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants. July 1, 2010.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2010b. Best Performance Standard. Thermally Enhanced Oil Recovery (TEOR) Wells. July 1, 2010.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2010c. Best Performance Standard. Steam Generators. June 24, 2010.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2011. Best Performance Standard. Front-line Organic Liquid Storage Tanks. February 23, 2011.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2015. *Guidance for Assessing and Mitigating Air Quality Impacts*. March 2015.

Stantec. 2023. Carbon Frontier Project Traffic Impact Study. September 2023.

Trinity Consultants. 2023. Air Quality Impact Analysis: CarbonFrontier Project. December 2023.

U.S. Environmental Protection Agency (EPA). 2021. Climate Adaptation Action Plan. October. Accessed December 7, 2023. https://www.epa.gov/system/files/documents/2021-09/epa-climate-adaptation-plan-pdf-version.pdf

U.S. Environmental Protection Agency (EPA). 2023a. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021. U.S. Environmental Protection Agency, EPA 430-R-23-002. Accessed December 7, 2023. https://www.epa.gov/system/files/documents/2023-04/US-GHG-Inventory-2023-Main-Text.pdf

U.S. Environmental Protection Agency (EPA). 2023b. "Clean Air Act Permitting for Greenhouse Gases." Accessed November 2023. https://www.epa.gov/nsr/clean-air-act-permitting-

greenhouse-gases#:~:text=Greenhouse%20gas%20(GHG)%20emissions%20from,beginning%20on%20January%202%2C%202011

Western Regional Climate Center (WRCC). 2023. Buttonwillow, California, Period of Record Monthly Climate Summary, 1/05/1901 to 6/10/2016. Accessed May 2023. https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca1244

4.9 Hazards and Hazardous Materials

Bohart, R.M. and R.K. Washino. 1978. *Mosquitoes of California* (3rd edition). University of California, Division of Agricultural Sciences, Berkeley, California.

California Department of Forestry and Fire Protection (CAL FIRE). 2023. "Fire Hazard Severity Zones." Accessed November 16, 2023. https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones/fire-hazard-severity-zones-maps

California Department of Public Health (CDPH). 2024. "Latest West Nile Virus Activity in California." Accessed January 2024. http://www.westnile.ca.gov/

California Department of Toxic Substances Control (DTSC). 2024. EnviroStor Database. Accessed January 2024. https://www.envirostor.dtsc.ca.gov/public/

Kern County Superintendent of Schools (KCSS). Not dated (a). Kern County Office of Education At a Glance. Accessed January 2024. https://www.flipsnack.com/AE5BDF86AED/kcsos-at-a-glance-2022_rev2/full-view.html

Kern County Superintendent of Schools (KCSS). Not dated (b). "Kern County School District Boundaries." Accessed January 2024. https://kern.org/wp-content/blogs.dir/4/files/sites/4/2021/07/District-Boundaries_pv.pdf

State Water Resources Control Board (SWRCB). 2024a. GeoTracker Database. Accessed January 2024. https://geotracker.waterboards.ca.gov/

State Water Resources Control Board (SWRCB). 2023b. GeoTracker – Mobil Exploration & Producing (T0602900394). Accessed January 2024. https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0602900394

4.10 Hydrology and Water Quality

Buena Vista Water Storage District (BVWSD). 2020. Buena Vista Water Storage District GSA Final Groundwater Sustainability Plan. Accessed February 2024. Accessed online at: https://www.bvh2o.com/COMPILED_GSP_doc.pdf

California Department of Water Resources (DWR). 2006. San Joaquin Valley Groundwater Basin Kern County Subbasin. California's Groundwater Bulletin 118.

California Geologic Energy Management Division (CalGEM). 2023a. "Well Stimulation Treatment." Accessed January 2024. Accessed online at: https://www.conservation.ca.gov/calgem/Pages/WST.aspx.

California Geologic Energy Management Division (CalGEM). 2023b. "Well Stimulation Treatment Oversight and Permit Review." Accessed January 2024. Accessed online at: https://www.conservation.ca.gov/calgem/Pages/Well-Stim-National-Lab-Scientific-Review.aspx.

Kern County. 2009. Kern County General Plan. Accessed January 2024. Accessed online at: https://psbweb.co.kern.ca.us/planning/pdfs/kcgp/KCGP_Complete.pdf.

Kern County Planning and Natural Resources Department. 2015. Environmental Impact Report for Revisions to the Kern County Zoning Ordinance – 2015 C. Accessed January 2024. Accessed online at: https://kernplanning.com/environmental-doc/environmental-impact-report-revisions-kern-county-zoning-ordinance-2015-c-focused-oil-gas-local-permitting/

Kern County Planning and Natural Resources Department. 2021. Supplemental Recirculated Environmental Impact Report (2020/2021). Accessed January 2024. Accessed online at: https://kernplanning.com/SREIR2020-oil-gas-zoning-revisions/

Kern Groundwater Authority (KGA). 2022. Amended KGA Groundwater Sustainability Plan. Accessed February 2024. Accessed online at: https://kerngwa.com/wp-content/uploads/2022/07/kga-amended-gsp-submitted-july-2022.pdf

Stantec Consulting Services Inc. (Stantec). 2023a. *Aquatic Resources Delineation Report*. July 2023.

Stantec Consulting Services Inc. (Stantec). 2023b. *Desktop Geohazards and Geotechnical Assessment*. July 2023.

Stantec Consulting Services Inc. (Stantec). 2023c. *Water Supply Assessment*. July 2023.

U.S. Army Corps of Engineers (USACE). 2023. "Isabella Lake Dam Safety Modification Project." Accessed January 2024. Accessed online at: https://www.spk.usace.army.mil/Missions/Civil-Works/Isabella-Dam/

U.S. Environmental Protection Agency (EPA). 2016. Title XIV of The Public Health Service Act: Safety of Public Water Systems (Safe Drinking Water Act). Accessed January 2024. Accessed online at: https://www.epa.gov/sdwa/title-xiv-public-health-service-act-safety-public-water-systems-safe-drinking-water-act-0.

Westside District Water Authority (WDWA). 2020. Chapter Groundwater Sustainability Plan. Accessed February 2024. Accessed online at: https://www.westsidedwa.org/wp-content/uploads/2020/01/Westside-District-Water-Authority-Management-Area-Plan_1.pdf

4.11 Land Use and Planning

California Department of Conservation (CDOC). 2023. California Important Farmland Finder. Accessed November 2023. https://maps.conservation.ca.gov/DLRP/CIFF/

California Geological Survey (CGS). 2009. *Update of Mineral Land Classification: Aggregate Materials in The Bakersfield Production-Consumption Region, Kern County, California.*

Kern County. 2009. *Kern County General Plan.* Accessed October 2023. https://psbweb.co.kern.ca.us/planning/pdfs/kcgp/KCGP_Complete.pdf

4.12 Mineral Resources

California Geological Survey (CGS). 2009. Update of Mineral Land Classification: Aggregate Materials in the Bakersfield Production-Consumption Region, Kern County, California.

California Department of Conservation, Division of Mine Reclamation (DMR). 2023. Mines Online. Accessed September 2023. https://maps.conservation.ca.gov/mol/index.html

Kern Economic Development Foundation (KDEF). 2021. The Economic Contribution of the Oil and Gas Industry in Kern County. Accessed September 2023. https://kernedc.com/wp-content/uploads/2021/04/KEDF-Economic-Contribution-of-theOil-and-Gas-Industry-in-Kern-County_-2021.pdf.

4.13 Noise

Kern County. 2004. Noise Element of the General Plan.

Kern County, Council of Governments, Regional Transportation Plan and Sustainable Communities Strategy Environmental Impact Report. 2022.

Kern County Code of Ordinances, Section 8.36 (Noise Control). 2007.

California Department of Transportation, Transportation and Construction Vibration Guidance Manual, September 2013.

Federal Highway Administration, Traffic Noise Model, Version 2.5, April 14, 2004.

California Department of Transportation, Roadway Construction Noise Model, 2006.

Stantec Consulting Services Inc. (Stantec). 2023. Noise Study.

4.14 Population and Housing

California Department of Housing and Community Development (HCD). 2022. “State Housing Law Overview.”

Kern Council of Governments (Kern COG). 2014. *Regional Housing Data Report*. Bakersfield, California. Accessed December 2022. https://www.kerncog.org/wp-content/uploads/2009/10/KernCOG_annual_2014.pdf.

Kern Council of Governments (Kern COG). 2022a. *Regional Transportation Plan/Sustainable Community Strategy*. Bakersfield, California. Accessed September 2023. https://www.kerncog.org/wp-content/uploads/2022/12/2022_RTP.pdf.

Kern County. 2016. *2015–2023 Housing Element Update. Resolution No. 2016-088.* Bakersfield, California. Accessed December 2022. https://psbweb.co.kern.ca.us/planning/pdfs/he/KCHE_2015.pdf.

Kern County. 2023. *2024–2031 Housing Element.* Bakersfield, California. Accessed September 2023. https://kernplanning.com/housing-element/.

Kern Economic Development Corporation (KEDC). 2023. *Kern County 2023 Market Overview & Member Directory*. Accessed September 2023. AC8918-KEDC-2023-Market-Overview-and-Member-Directory-DIGITAL.pdf (kernedc.com).

State of California, Department of Finance (DOF). 2021. *Report E-5 Population and Housing Estimates for Cities, Counties and the State, January 1, 2011–2020*. Sacramento, California. Accessed December 2022. E-5_2010-2020InternetVersion.xlsx (live.com).

State of California, Department of Finance (DOF). 2023. *Report E-5 Population and Housing Estimates for Cities, Counties and the State, January 1, 2021–2023.* Sacramento, California. Accessed October 2023. E-5_2023_InternetVersion.xlsx (live.com).

State of California, Employment Development Department. 2021. "Labor Market Information, Bakersfield MSA Labor Force Data" (Excel). Accessed October 2023. https://labormarketinfo.edd.ca.gov/geography/kern-county.html.

U.S. Census Bureau. 2021. "American Community Survey, 5-Year Estimates, Occupied Housing Units, 2005-2009, 2010-2014, 2015-2019." Accessed December 2022. https://www.census.gov/library/visualizations/interactive/acs-percentage-owner-hu-2015-2019.html

4.15 Public Services

California Department of Forestry and Fire Protection (CAL FIRE). 2022. "About CAL FIRE." Accessed January 2024. http://calfire.ca.gov/about/about.php.

California Department of Forestry and Fire Protection (CAL FIRE). 2024. State Responsibility Area Fire Hazard Severity Zones. Accessed June 10, 2024. https://calfire-forestry.maps.arcgis.com/apps/mapviewer/index.html?layers=ac8ed44d76ed4988bceb07d35d80f4cb

California Highway Patrol (CHP). 2023a. "The CHP Geographical Organization." Accessed January 2024. https://www.chp.ca.gov/CHPCareersSite/Pages/CHP-Map.aspx .

California Highway Patrol (CHP). 2023b. "Central Division." Accessed January 2024. https://www.chp.ca.gov/find-an-office/central-division.

California Highway Patrol (CHP). 2023c. "Offices." Accessed January 2024. https://www.chp.ca.gov/find-an-office/central-division/offices.

California Emergency Medical Services Authority (CEMSA). 2019. Ambulance Zones, Ground Exclusive Operating Areas (EOA) Status Determinations by EMSA As of October 2019. Accessed January 2024. https://emsa.ca.gov/wp-content/uploads/sites/71/2019/10/101019-Ambu-Zone.pdf

City of Bakersfield. 2023. "City of Bakersfield Fire Station Locator and Information Map." Accessed January 2024. https://cob.maps.arcgis.com/apps/webappviewer/index.html?id=8c056dff7b2f45b6916f15f7caa7f15c

Healthy Community Institute and Strategy Solutions. 2019. Community Health Assessment and Improvement Plan 2018–2019. Accessed January 2024. https://kernpublichealth.com/wp-content/uploads/2019/12/KCPHSD-Community-Health-Assessment-and-Improvement-Plan-2018.2019.pdf

Kern County Administrative Office (KCCAO). 2022. "County Budget" Accessed January 2024. https://www.kerncounty.com/government/county-administrative-office/cao/budget-and-finance/county-budget

Kern County Fire Department (KCFD). 2009. Kern County Fire Department Wildland Fire Management Plan.

Kern County Fire Department (KCFD). 2020. County of Kern Multi-Jurisdictional Hazard Mitigation Plan. Accessed January 2024. https://mitigatehazards.com/county-of-kern/kern-hmp-docs/

Kern County Fire Department (KCFD). 2022. Kern County Fire Department 2021 Strategic Fire Plan. April 2022. Accessed January 2024. https://osfm.fire.ca.gov/media/rl1j40en/2022-kern-county-unit-fire-plan.pdf.

Kern County Fire Department (KCFD). 2023a. "About the Kern County Fire. Department Profile." Accessed January 2024. https://kerncountyfire.org/about-kcfd/.

Kern County Fire Department (KCFD). 2023b. "Divisions – The Emergency Communications Center (ECC)." Accessed January 2024. https://kerncountyfire.org/about-kcfd/divisions/

Kern County Planning and Natural Resources Department. 2020. Letter. RE: Report – Kern County Oil and Gas Property Tax Revenue (2018-2019) Analysis: County, Cities, Schools and Special Districts (July 8, 2020). Accessed January 2024. https://psbweb.co.kern.ca.us/planning/pdfs/kc_oil_gas_prop_tax_revenue_report.pdf

Kern County. 2009. Kern County General Plan. Accessed January 2024. https://psbweb.co.kern.ca.us/planning/pdfs/kcgp/KCGP_Complete.pdf.

Kern County Superintendent of Schools (KCSS). Not dated (a). Kern County Office of Education At a Glance. Accessed January 2024. https://www.flipsnack.com/AE5BDF86AED/kcsos-at-a-glance-2022_rev2/full-view.html

Kern County Superintendent of Schools (KCSS). Not dated (b). "Kern County School District Boundaries." Accessed January 2024. https://kern.org/wp-content/blogs.dir/4/files/sites/4/2021/07/District-Boundaries_pv.pdf

Kern County Sherriff's Office (KCSO). 2023a. "KCSO History." Accessed January 2024. https://www.kernsheriff.org/History.

Kern County Sherriff's Office (KCSO). 2023b. "Metro Patrol." Accessed January 2024. https://www.kernsheriff.org/Metro_Patrol

Pruitt, Ray, Kern County Sheriff. 2014. Email to Louise Flynn, Ecology and Environment, Inc. RE: Average response times for Kern County Sheriff. May 20, 2014.

4.16 Recreation

Kern County Parks and Recreation Department. 2010. Parks and Recreation Master Plan. Accessed September 28, 2023. https://www.kerncounty.com/home/showpublisheddocument/2148/637127126894370000

4.17 Transportation

Amtrak. 2022. California Train Routes. Online at: http://www.amtrak.com/california-train-routes. Accessed October 2023.

AirNav. Airport Information. Online at: www.airnav.com. Accessed October 2023.

California Department of Transportation (Caltrans). 2022. Transportation Permits. Online at: http://www.dot.ca.gov/hq/traffops/permits. Accessed October 2023.

California High-Speed Rail Authority. 2022. Home Page. Online at: http://www.hsr.ca.gov. Accessed October 2023.

GetBus. 2022. Maps and Timetables. Online at: http://www.getbus.org/new-system-maps-timetables. Accessed October 2023.

Greyhound. 2022. Map of Greyhound Lines. Prepared by Russell's Guides, Inc. January 27. Online at: http://extranet.greyhound.com/Revsup/schedules/sa-50.pdf. Accessed October 2023.

Kern County. 2012. Airport Land Use Compatibility Plan.

Kern Council of Governments (Kern COG). *2022 Kern Regional Transportation Plan and Sustainable Communities Strategy Environmental Impact Report.* Accessed October 2023. https://www.kerncog.org/wp-content/uploads/2022/12/2022_RTP.pdf

Kern Regional Transit. 2022. Bus Services. Online at: http://roads.kerndsa.com/bus-services. Accessed October 2023.

Kern Regional Transportation Plan. 2018. Online at: https://www.kerncog.org/wp-content/uploads/2018/04/Kern_ATP_Plan.pdf. Accessed October 2023.

OPR (Governor's Office of Planning and Research). 2018. Technical Advisory on Evaluating Transportation Impacts in CEQA.

Stantec Consulting Services Inc. (Stantec). 2023. Traffic Impact Study

4.18 Tribal Cultural Resources

U.S. Department of Interior. 1995. National Register of Historic Places Program: National Register Federal Program Regulations. Online at: Regulations - National Register of Historic Places (U.S. National Park Service) (nps.gov) Accessed October 18, 2023.

Whitley, David S., Nick Doose, Carmen M.T. Whitley, and Jena Rizzi, B.A. 2014. Cultural Resource Technical Report: Kern County Oil and Gas Study, Prepared by ASM Affiliates, Inc. Accessed October 18, 2023.

4.19 Utilities and Service Systems

California Department of Resources Recycling and Recovery (CalRecycle). 2019. "SWIS Facility/Site Activity Details, Taft Recycling & Sanitary Landfill." Accessed June 2023. https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/3895?siteID=709.

California Geologic Energy Management Division (CalGEM). 2019. "Water Reporting in Oil and Gas Operations." Accessed October 2023. https://www.conservation.ca.gov/calgem/Pages/Chevron-Cymric-oil-spill.aspx.

Kern County Public Works. 2023. "Disposal Sites." Accessed October 2023. https://kernpublicworks.com/waste-management/disposal-sites/.

Stantec Consulting Services, Inc. (Stantec). 2023. *Water Supply Assessment.*

4.20 Wildfire

California Department of Forestry and Fire Protection (CAL FIRE). 2024a. Fire and Resource Assessment Program (FRAP) Fire Perimeters, Wildfire Perimeters by Decade Greater Than 5,000 Acres, 1950-2023. Accessed June 2024, at https://www.fire.ca.gov/what-we-do/fire-resource-assessment-program/fire-perimeters

CAL FIRE. 2024b. Incident Map. Accessed June 2024, at https://www.fire.ca.gov/incidents/

CAL FIRE. 2024c. State Responsibility Area Fire Hazard Severity Zones. Accessed June 2024, at https://calfire-forestry.maps.arcgis.com/apps/mapviewer/index.html?layers=ac8ed44d76ed4988bceb07d35d80f4cb

International Journal of Wildland Fire. 2010. A numerical study of slope and fuel structure effects on coupled wildfire behaviour. Accessed January 2024, at https://www.fs.usda.gov/research/treesearch/35148

Kern County Fire Department (KCFD). 2022. 2021 Strategic Fire Plan. Accessed June 2024, at https://cdnverify.osfm.fire.ca.gov/media/rl1j40en/2022-kern-county-unit-fire-plan.pdf

Stantec. 2023. Biological Resources Technical Report.

6.0 Alternatives

California Air Resources Board (CARB). 2022. 2022 S*coping Plan for Achieving Carbon Neutrality. November 16, 2022*. Accessed August 2023. https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf

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Chapter 11

Acronyms and Abbreviations

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Chapter 11

Acronyms and Abbreviations

2022 Scoping Plan	2022 Scoping Plan for Achieving Carbon Neutrality
°F	degrees Fahrenheit
°C	degrees Celsius
AAQA	Ambient Air Quality Analysis
AB	Assembly Bill
ACBM	asbestos-containing building material
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing materials
ADT	average daily trip
af	acre-feet
afy	acre-feet per year
ALUCP	Airport Land Use Compatibility Plan
amsl	above mean sea level
AOR	Area of Review
APE	area of potential effect
API	American Petroleum Institute
APN	assessor's parcel number
ASTM	American Society for the Testing and Materials
ATC	Authority to Construct
ATCM	Airborne Toxic Control Measures
Basin Plan	Tulare Lake Basin Water Quality Control Plan
BAU	business as usual
BGEPA	Bald and Golden Eagle Protection Act
bgs	below ground surface
BNLL	blunt-nosed leopard lizard
BMA	Buttonwillow Management Area
BMWD	Berenda Mesa Water District
BO	barrels of oil
BPS	Best Performance Standard
BSA	biological study area
BVGSA	Buena Vista Groundwater Sustainability Agency
BVWSD	Buena Vista Water Storage District
BWSD	Belridge Water Storage District
C&D	construction and demolition
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAFE	Corporate Average Fuel Economy
CalARP	California Accidental Release Prevention Program
CalEEMod	California Emission Estimator Model
CAL FIRE	California Department of Forestry and Fire Protection
CalGEM	California Geologic Energy Management
CALGreen	California Green Building Code Requirements
CalHHS	California Department of Health and Human Services
CalOES	California Office of Emergency Services

Cal/OSHA	California Occupational Safety and Health Administration
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CAO	County Administrative Office
CAT	Climate Action Team
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCAP	Climate Change Action Plan
CCH	Consortium of California Herbaria
CCR	California Code of Regulations
CCS	carbon capture and storage
CCUS	carbon capture, utilization, and storage
CDFW	California Department of Fish and Wildlife
CDMA	Carbon Dioxide Management Agreement
CDR	carbon dioxide removal
CDWR	California Department of Water Resources
CEC	California Energy Commission
CEMSA	California Emergency Medical Services Authority
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERS	California Environmental Reporting System
CESA	California Endangered Species Act
CFGC	California State Fish and Game Code
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH4	methane
CHL	California Historical Landmarks
CHP	California Highway Patrol
CIC-ORPS	Cumulative Impact Oil and Gas Reservoir Pore Space Charge
CIP	Capital Improvement Program
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COG	Council of Governments
Cogen	Co-Generation
COGEN 32	Co-Generation Plant 32
County	Kern County
CNEL	Community Noise Equivalent Level
Cortese	State of California Hazardous Waste and Substances Sites
CPUC	California Public Utilities Commission
CRC	California Resources Corporation
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CUP	Conditional Use Permit
CUPA	Certified Unified Program Agency
CVP	Central Valley Project
CVR	Casing Vapor Recovery
CWA	Clean Water Act
CYBP	calibrated years before present

DAC	direct air capture
DAS	distributed acoustic sensors
dB	decibel
dBA	A-weighted decibel
Denbury	Denbury Gulf Coast Pipelines LLC
DMA	Developer Mitigation Agreement
DMC	Development Mitigation Contracts
DNL	average day-night level
DOC	California Department of Conservation
DOF	California Department of Finance
DOGGR	Division of Oil, Gas, and Geothermal Resources
DOSH	California Division of Occupational Safety and Health
DPM	diesel particulate matter
DTS	distributed temperature sensors
DTSC	California Department of Toxic Substances Control
DWR	Department of Water Resources
EIR	Environmental Impact Report
EISA	Energy Independence and Security Act
EMFAC	Emission Factors
EMS	Emergency Medical Services
EO	Executive Order
EOR	enhanced oil recovery
EPA	(U.S.) Environmental Protection Agency
EPCA	Energy Policy and Conservation Act of 1975
ERC	Emission Reduction Credits
ERRP	Emergency and Remedial Response Plan
ESA	Environmental Site Assessment
FAA	Federal Aviation Administration
FEIR	Final Environmental Impact Report
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FPPA	Farmland Protection Policy Act
FHSZ	Fire Hazard Severity Zone
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FRA	Federal Railroad Administration
FSZ	Farmland Security Zone
FTIP	Federal Transportation Improvement Program
FY	Fiscal Year
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
GHG	greenhouse gas
GP 32	Gas Plant 32
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
GWh	Gigawatt hour
GWP	global warming potential
H_2S	Hydrogen sulfide
HAP	Hazardous air pollutants
HCA	High Consequence Areas
HCD	California Department of Housing and Community Development
HCP	habitat conservation plan

HFC	hydrofluorocarbon
HHD	Heavy Heavy-Duty
HMBP	Hazardous Materials Business Plan
HMIS	Hazardous Materials Inventory Statement
HMMP	Hazardous Materials Management Plan
HMTA	Hazardous Materials Transportation Act
HRA	Health Risk Assessment
HRRS	Health-Risk Reduction Strategy
HSC	Health and Safety Code
HSWA	Associated Hazardous and Solid Waste Amendment
Hydrologic Region	Tulare Lake Hydrologic Region
Hz	Hertz
IPaC	Information for Planning and Consultation
IPCC	Intergovernmental Panel on Climate Change
IRA	Inflation Reduction Act
IRWM	Integrated Regional Water Management
ISO	International Organization for Standardization
ISR	Indirect Source Rule
ITP	incidental take permit
K-Factor	soil-erodibility factor
KCCAO	Kern County Administrative Office
KCGP	Kern County General Plan
KCFD	Kern County Fire Department
KCOG	Kern Council of Governments
KCPNR	Kern County Planning and Natural Resources
KCSO	Kern County Sherrif's Office
KCSS	Kern County Superintendent of Schools
KCWA	Kern County Water Agency
KEDC	Kern Economic Development Corporation
kg/s	kilograms per second
KGA	Kern Groundwater Authority
km	kilometer
KOP	key observation point
KRN	Kern Regional Transit
L-DAC	liquid solvents
LBP	lead-based paint
LCFS	Low Carbon Fuel Standard
L_{dn}	average day-night level
L_{eq}	equivalent sound pressure level
LHWD	Lost Hills Water District
LLNL	Lawrence Livermore National Laboratory
L_{max}	maximum noise level
LOS	level of service
LUST	Leaking Underground Storage Tank
Master Plan	Kern County Parks and Recreation Master Plan
MBTA	Migratory Bird Treaty Act
µg/L	micrograms per liter
mg/L	milligrams per liter
MDAB	Mojave Desert Air Basin
MM	mitigation measure
MMBtu/hr	Millions of British Thermal Units per hour

MMCFG/day	million cubic feet of gas per day
MMT	million metric tons
MPO	metropolitan planning organization
MRZ	Mineral Resource Zone
MT	metric tons
MW	megawatt
MWh	megawatt-hour
N	nitrate
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NCCP	natural community conservation plan
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
N_2O	nitrous oxide
NMFS	National Marine Fisheries Service
NOC	Notice of Completion
NOI	Notice of Intent
NONA	Notice of Non-Applicability
NOP	Notice of Preparation
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NR	Natural Resource
NRC	National Response Center
NRCS	Natural Resources Conservation Service
NRF	National Response Framework
NRHP	National Register of Historic Places
NSR	New Source Review
NTSA	National Trails System Act
OEHHA	Office of Environmental Health Hazard Assessment
OPR	Office of Planning and Research
OPS	Office of Pipeline Safety
OSAE	Office of Audits and Evaluation
OSHA	Occupational Safety and Health Administration
OSFM	Office of State Fire Marshal
PA	participating agency
PAH	polycyclic aromatic hydrocarbons
PEER	Permit-Exempt Equipment Registration
PERC	tetrachloroethylene
PFC	perfluorocarbon
PG&E	Pacific Gas and Electric Company
PGA	peak ground acceleration
PHMSA	Pipeline and Hazardous Material Safety Administration
PSD	Prevention of Significant Deterioration
PSIA	Pipeline Safety Improvement Act
PM	particulate matter
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
Post-C	post-combustion
ppm	parts per million

Pre-C	pre-combustion
PRC	Public Resources Code
project	CarbonFrontier Project
psig	pounds per square inch gauge
PTO	Permit to Operate
PVC	polyvinyl chloride
REC	recognized environmental condition
RFS	renewable fuel standards
RMP	Risk Management Program
RNG	renewable natural gas
RO	reverse osmosis
ROG	reactive organic gas
RPS	Renewables Portfolio Standard
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
S-DAC	solid sorbents
SAFE	Safer Affordable Fuel-Efficient
SARA	Superfund Amendments and Reauthorization Act
SB	Senate Bill
SCADA	supervisory control and data acquisition
SCS	sustainable community strategies
SDWA	Safe Drinking Water Act
SF_6	sulfur hexafluoride
SGMA	Sustainable Groundwater Management Act
SGS	steam generator setting
SHPO	State Historic Preservation Officer
SHRC	State Historical Resources Commission
SIP	State Implementation Plan
SJAS	San Joaquin antelope squirrel
SJV	San Juan Valley
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLCP	short-lived climate pollutants
SLF	Sacred Lands File
SMARA	Surface Mining and Reclamation Act of 1975
SMGB	State Mining and Geology Board
SO_2	sulfur dioxide
SO	sulfur monoxide
SO_x	sulfur oxides
SPCC	Spill, Prevention, Control, and Countermeasure
SR	State Route
SRA	State Responsibility Area
SREIR	Supplemental Recirculated Environmental Impact Report
SSC	species of special concern
State	State of California
Stantec	Stantec Consulting Services Inc.
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminants
TMDL	total maximum daily loads

TVR	tank vapor recovery
UFC	Uniform Fire Code
UIC	Underground Injection Control
UNGS	underground natural gas storage
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USDOT	U.S. Department of Transportation
USDW	underground sources of drinking water
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank
UWMP	Urban Water Management Plan
VERA	Voluntary Emission Reduction Agreement
VOC	volatile organic compound
VMT	vehicle miles traveled
Warren-Alquist Act	Warren-Alquist Energy Resources Conservation and Development Act
WSA	Water Supply Assessment
WDR	waste discharge requirements
WDWA	Westside District Water Authority
WKWD	
WOTUS	Waters of the United States
WST	well stimulation treatment
WY	water year
YSMN	Yuhaaviatam of San Manuel Nation
ZCC	Zone Change Case

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Chapter12

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Chapter 12

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