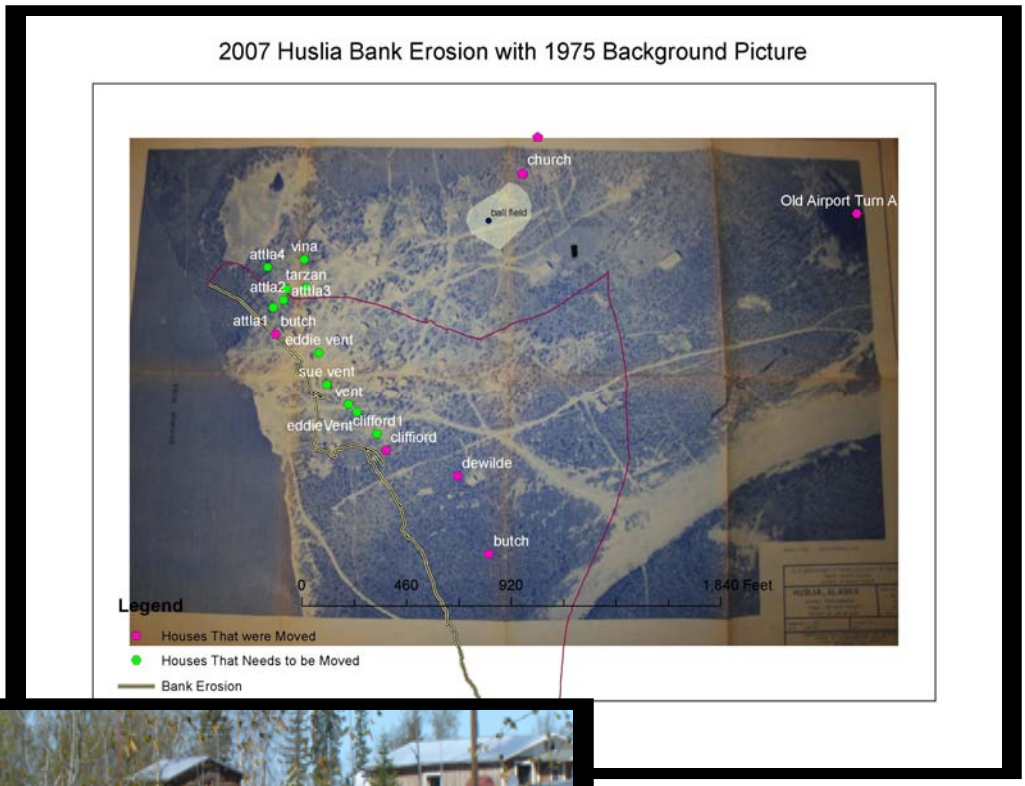
The City of Huslia
Hazard Mitigation Plan



Prepared by
The City of Huslia
Mitigation Planning Team

February 2010

U.S. Department of Homeland Security
Region X
130 228th Street, SW
Bothell, WA 98021-9796

FEMA

February 23, 2010

Honorable Speedy Sam
Mayor, City of Huslia
P.O. Box 10
Huslia, Alaska 99746

Dear Mayor Sam:

The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) has approved the ***City of Huslia, Alaska Multi-Hazard Mitigation Plan*** as a local plan as outlined in 44 CFR Part 201. With approval of this plan, the City of Huslia is now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through February 23, 2015.

The plan's approval provides eligibility to apply for hazard mitigation projects through your State. All requests for funding will be evaluated individually according to the specific eligibility and other requirements of the particular program under which the application is submitted. For example, a specific mitigation activity or project identified in the plan may not meet the eligibility requirements for FEMA funding, and even eligible mitigation activities are not automatically approved for FEMA funding under any of the aforementioned programs.

Over the next five years, we encourage your community to follow the plan's schedule for its monitoring and updating, and to develop further mitigation actions. The plan must be reviewed, revised as appropriate, and resubmitted for approval within five years in order to continue project grant eligibility.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact our State counterpart, Alaska Division of Homeland Security and Emergency Management, which coordinates and administers these efforts for local entities.

Sincerely,

Mark Carey, Director
Mitigation Division

cc: Mark Roberts, Alaska Division of Homeland Security and Emergency Management
Elsie Vent, City Administrator, City of Huslia

Enclosure

BH:bb

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Acronyms/Abbreviations

°F	Degrees Fahrenheit
AFG	Assistance to Firefighters Grant
AHFC	Alaska Housing Finance Corporation
ANA	Administration for Native Americans
ANCSA	Alaska Native Claims Settlement Act
ANTHC	Alaska Native Tribal Health Consortium
APA	American Planning Association
ARC	American Red Cross
ARCS	Alaska Rural Communication Service
AVEC	Alaska Village Electric Cooperative
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CD	Compact Disc
CDBG	Community Development Block Grant
CHEMS	Community Health and Emergency Medical Services
CFR	Code of Federal Regulations
DCCED	Department of Commerce, Community, and Economic Development
DCRA	Division of Community and Regional Affairs
DEC	Department of Environmental Conservation
DHSS	Department of Health and Social Services
DHS	United States Department of Homeland Security
DHS&EM	Division of Homeland Security and Emergency Management
DMA 2000	Disaster Mitigation Act of 2000
DMVA	Department of Military and Veterans Affairs
DNR	Department of Natural Resources
DOF	Division of Forestry
DOT/PF	Department of Transportation and Public Facilities
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance
FP&S	Fire Prevention and Safety
ft	feet
FY	Fiscal Year
g	gravity as a measure of peak ground acceleration
HAZUS-MH	Hazards U.S-Multi-Hazard
HMA	Hazard Mitigation Assistance

HMGP	Hazard Mitigation Grant Program
HWE	High Water Elevation
HMP	Hazard Mitigation Plan
HUD	Housing and Urban Development
IBHS	Institute for Business and Home Safety
IRHA	Interior Rural Housing Authority
IRS	Internal Revenue Service
M	Magnitude
MHHW	mean high high water
MM	Modified Mercalli
MPH	miles per hour
NAHASDA	Indian Housing Block Grant – Native American Housing Assistance and Self Determination Act
NFIP	National Flood Insurance Program
ONHW	Oregon Natural Hazards Workgroup
PDM	Pre-Disaster Mitigation
PGA	peak ground acceleration
PHS	Public Health Service
RL	repetitive loss
RFC	repetitive flood claims
SAFER	Staffing for Adequate Fire and Emergency Response
SBA	Small Business Administration
SRL	severe repetitive loss
Stafford Act	Robert T. Stafford Disaster Relief and Emergency Assistance Act
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic, and Environmental
UHMA	Unified Hazard Mitigation Assistance
URS	URS Corporation
USACE	United States Army Corps of Engineers
USDA/RD	United States Department of Agriculture/Rural Development
U.S.	United States
USC	United States Code
USGS	United States Geological Survey
USPHS	United States Public Health Service
VPSO	Village Public Safety Officer

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This section provides a brief introduction to hazard mitigation planning, the grants associated with these requirements, and a description of this Hazard Mitigation Plan (HMP).

1.1 HAZARD MITIGATION PLANNING

Hazard mitigation, as defined in Title 44 of the Code of Federal Regulations (CFR), Part 201, §201.2, is "any sustained action taken to reduce or eliminate the long-term risk to human life and property from natural hazards." Many areas have expanded this definition to also include human-caused hazards. As such, hazard mitigation is any work done to minimize the impacts of any type of hazard event before it occurs. It aims to reduce losses from future disasters. Hazard mitigation is a process in which hazards are identified and profiled, people and facilities at risk are analyzed, and mitigation actions are developed. The implementation of the mitigation actions, which include long-term strategies that may include planning, policy changes, programs, projects, and other activities, is the end result of this process.

1.2 PLANNING REQUIREMENTS

1.2.1 Local Mitigation Plans

In recent years, local hazard mitigation planning has been driven by a new Federal law. On October 30, 2000, Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390) which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) (Title 42 of the United States Code [USC] 5121 et seq.) by repealing the act's previous mitigation planning section (409) and replacing it with a new mitigation planning section (322). This new section emphasized the need for State, Tribal, and local entities to closely coordinate mitigation planning and implementation efforts. In addition, it provided the legal basis for the Federal Emergency Management Agency's (FEMA) mitigation plan requirements for mitigation grant assistance.

To implement these planning requirements, FEMA published an Interim Final Rule in the Federal Register on February 26, 2002 (FEMA 2002a), 44 CFR Part 201 with subsequent updates. The planning requirements for local entities are described in detail in Section 2 and are identified in their appropriate sections throughout this HMP. Appendix A contains the July 01, 2008 FEMA crosswalk, which documents 44 CFR compliance.

FEMA's October 31, 2007 and July 2008 changes to 44 CFR Part 201 combined and expanded flood mitigation planning requirements with local hazard mitigation plans (44 CFR §201.6). All hazard mitigation assistance program planning requirements for the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA), Severe Repetitive Loss (SRL), and potentially Repetitive Flood Claim (RFC) programs were combined eliminating duplicated mitigation plan requirements. It also required participating NFIP communities' risk assessments and mitigation strategies to identify and address repetitively flood damaged properties. Local hazard mitigation plans now qualify communities for the following Federal Hazard Mitigation Assistance grant programs:

- *Hazard Mitigation Grant Program*
- *Pre-Disaster Mitigation*
- *Flood Mitigation Assistance*
- *Severe Repetitive Loss*
- *Repetitive Flood Claim*

FEMA policy may require a local mitigation plan under the RFC Program, at which time this policy will apply to those governments that apply for and/or receive assistance under the RFC program as well.

1.3 GRANT PROGRAMS WITH MITIGATION PLAN REQUIREMENTS

All five FEMA grant programs provide funding to States, Tribes, and local entities that have a FEMA-approved State, Tribal, or Local Mitigation Plan. Two of the grants are authorized under the Stafford Act and DMA 2000, while the remaining three are authorized under the National Flood Insurance Act and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act. As of June 19, 2008, the grant programs were segregated. The HMGP is a directly funded competitive disaster grant program. Whereas the other programs: PDM, FMA, RFC, and SRL programs although competitive, rely on specific grant pre-disaster grant funding sources, sharing several common elements.

> *The Department of Homeland Security (DHS) FEMA Hazard Mitigation Assistance (HMA) grant programs present a critical opportunity to protect individuals and property from natural hazards while simultaneously* ***reducing reliance on Federal disaster funds****. The HMA programs provide pre-disaster mitigation grants annually to States, Territories, Tribes, and local communities. The statutory origins of the programs differ, but all share the common goal of reducing the loss of life and property due to natural hazards.*
>
> *The PDM program is authorized by the Stafford Act and focuses on mitigation project and planning activities that address multiple natural hazards, although these activities may also address hazards caused by manmade events. The FMA program, RFC program, and SRL program are authorized by the National Flood Insurance Act, and focus on reducing claims against the NFIP* (FEMA 2006e).

1.3.1 Unified Hazard Mitigation Assistance (UHMA) Programs

The HMGP provides grants to States, Tribes, and local entities to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. Projects must provide a long-term solution to a problem, for example, elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood. In addition, a project's potential savings must be more than the cost of implementing the project. Funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. The amount of funding available for the HMGP under a particular disaster declaration is limited. FEMA may provide a State or Tribe with up to 20 percent of the

total aggregate disaster damage costs to fund HMGP project or planning grants. The cost-share for this grant is 75 percent Federal/25 percent non-Federal.

The PDM program provides funds to State, Tribes, and local entities, including universities, for hazard mitigation planning and mitigation project implementation prior to a disaster event. PDM grants are awarded on a nationally competitive basis. Like HMGP funding, a PDM project's potential savings must be more than the cost of implementing the project. In addition, funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. The total amount of PDM funding available is appropriated by Congress on an annual basis. In Fiscal Year (FY) 2008, PDM program funding totaled approximately $54 million. The cost-share for this grant is 75 percent Federal/25 percent non-Federal.

The goal of the FMA grant program is to reduce or eliminate flood insurance claims under the NFIP. Particular emphasis for this program is placed on mitigating repetitive (RL) properties. The primary source of funding for this program is the National Flood Insurance Fund. Grant funding is available for three types of grants, including Planning, Project, and Technical Assistance. Project grants, which use the majority of the program's total funding, are awarded to States, Tribes, and local entities to apply mitigation measures to reduce flood losses to properties insured under the NFIP. In FY 2008, FMA funding totaled $32 million. The cost-share for this grant is 75 percent Federal/25 percent non-Federal. However, 90 percent Federal/10 percent non-Federal to mitigate SRL properties is available in certain situations.

> Riverine flooding is not a threat for the City of Huslia. However, Mingoguit Lake overflow flooding occurs annually.
>
> The City of Huslia is not currently a member of the NFIP.

The SRL program provides funding to reduce or eliminate the long-term risk of flood damage to residential structures insured under the NFIP. Structures considered for mitigation must have at least four NFIP claim payments over $5,000 each, when at least two such claims have occurred within any 10-year period, and the cumulative amount of such claim payments exceeds $20,000; or for which at least two separate claim payments have been made with the cumulative amount of the building portion of such claims exceeding the value of the property, when two such claims have occurred within any 10-year period. Congress authorized $40 million for Fiscal Year (FY) 2006 and FY 2007, $80 million for FY 2008, and $80 million for FY 2009. The cost-share for this grant is 75 percent Federal/25 percent non-Federal. However, 90 percent Federal/10 percent non-Federal to mitigate SRL properties is available when the State or Tribal plan addresses ways to mitigate SRL properties.

The RFC program provides funding to reduce or eliminate the long-term flood damage risk to residential and nonresidential structures insured under the NFIP. Up to $10 million is available annually to assist States and communities with reducing flood damages to structures which have had one or more claim payments for flood damages. All RFC grants are eligible for up to 100 percent Federal assistance.

1.4 HMP DESCRIPTION

The remainder of this HMP consists of the following sections and appendices:

Prerequisites

Section 2 addresses the prerequisites of plan adoption, which include adoption by the City of Huslia. The adoption resolution is included in Appendix B.

Community Description

Section 3 provides a general history and background of the City of Huslia, including historical trends for population and the demographic and economic conditions that have shaped the area. Trends in land use and development are also discussed. A location figure of the area is included.

Planning Process

Section 4 describes the planning process and identifies the Planning Team Members, the meetings held as part of the planning process, the URS Corporation (URS) consultants, and the key stakeholders within the city and the surrounding area. In addition, this section documents public outreach activities (Appendix C) and the review and incorporation of relevant plans, reports, and other appropriate information.

Hazard Analysis

Section 5 describes the process through which the Planning Team identified, screened, and selected the hazards to be profiled in this version of the HMP. The hazard analysis includes the nature, history, location, extent, impact, and probability of future events for each hazard. In addition, historical and hazard location figures are included.

Vulnerability Analysis

Section 6 identifies potentially vulnerable assets—people, residential and nonresidential buildings dwelling units (where available), critical facilities, and critical infrastructure—in the City of Huslia. The resulting information identifies the full range of hazards that the City of Huslia could face and potential social impacts, damages, and economic losses.

Mitigation Strategy

Section 7 defines the mitigation strategy which provides a blueprint for reducing the potential losses identified in the vulnerability analysis. The Planning Team developed a list of mitigation goals and potential actions to address the risks facing the City of Huslia. Mitigation actions include preventive actions, property protection techniques, natural resource protection strategies, structural projects, emergency services, and public information and awareness activities. In the spirit of the new requirements, mitigation strategies were developed encouraging participation with the NFIP and the reduction of flood damage to flood-prone structures.

Plan Maintenance

Section 8 describes the Planning Team's formal plan maintenance process to ensure that the HMP remains an active and applicable document. The process includes monitoring, evaluating (Appendix E), and updating the HMP; implementation through existing planning mechanisms; and continued public involvement.

References

Section 9 lists the reference materials used to prepare this HMP.

Appendix A

Appendix A provides the FEMA crosswalk, which documents compliance with FEMA criteria.

Appendix B

Appendix B provides the adoption resolution for the City of Huslia.

Appendix C

Appendix C provides public outreach information, including newsletters.

Appendix D

Appendix D contains the Benefit-Cost Analysis Fact Sheet used to prioritize mitigation actions.

Appendix E

Appendix E provides the plan maintenance documents, such as an annual review sheet and the progress report form.

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2.1 ADOPTION BY LOCAL GOVERNING BODIES AND SUPPORTING DOCUMENTATION

The requirements for the adoption of this HMP by the local governing body, as stipulated in the DMA 2000 and its implementing regulations are described below:

DMA 2000 REQUIREMENTS: PREREQUISITES

Local Plan Adoption

Requirement §201.6(c)(5): The local hazard mitigation plan shall include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, Commissioner, Tribal Council).

Element

- Has the local governing body adopted the new or updated plan?
- Is supporting documentation, such as a resolution, included?

Source: FEMA, July 2008.

The City of Huslia is the local jurisdiction represented in this HMP and meets the requirements of Section 409 of the Stafford Act and Section 322 of DMA 2000.

The local governing body of the City of Huslia adopted the HMP by resolution on February 5, 2010. A scanned copy of the resolution is included in Appendix B.

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This section describes the location, geography, and history; demographics; and land use development trends of the City of Huslia.

3.1 LOCATION, GEOGRAPHY, AND HISTORY

"Huslia is a second class city located in the Unorganized Borough. The community is situated on the north bank of the Koyukuk River, about 170 river miles northwest of Galena and 290 air miles west of Fairbanks. It lies within the Koyukuk National Wildlife Refuge. It lies at approximately 65.698610 North Latitude and -156.399720 West Longitude. (Sec. 33, T004N, R012E, Kateel River Meridian)" (Division of Community and Regional Affairs (DCRA) 2009).

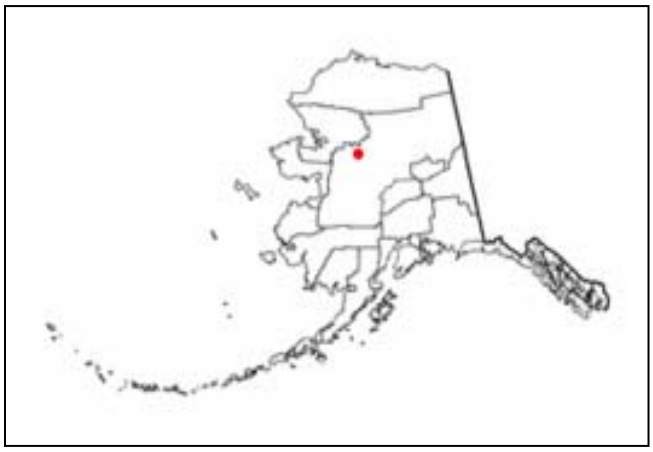

Figure 3-1 Huslia Location Map

The City of Huslia (City) covers approximately 16.4 square land miles and approximately 0.7 square miles of water. Extreme temperature changes occur throughout Alaska's interior. Huslia temperatures range from a winter low of -65 degrees Fahrenheit (ºF) to above 90ºF during summer. The area receives approximately 13 inches of rain and 70 inches of snow.

The Koyukon Athabascans were a nomadic people; migrating throughout the year between seasonal camps where they harvested wild game and fish and gathered berries and other food sources available between the south fork of the Koyukuk and Kateel River valleys. Trading supplemented their subsistence life style allowing tribal members to access goods from Kobuk River Eskimos and others traversing the area.

Missionaries and commercial enterprises between 1843 through 1926 caused the Athabascans to transition from their nomadic lifestyle. The Cutoff Trading Post and other infrastructure began to develop in the early 1920s. However, due to repeat flooding, inhabitants moved to the current townsite where a school was built in 1950, then a post office, airport, and roads were built in 1952. At this point families started to remain near town, built homes, and eventually a clinic in 1960. The City became incorporated in 1969.

The Huslia Tribal Council has existed since 1972 and works closely with the City government to improve resident's quality of life (DCRA 2009).

3.2 DEMOGRAPHICS

The 2000 census recorded 293 residents, of which the median age was 24.4 indicating a relatively young population. The population of Huslia is expected to grow at the same or accelerated rate because over half of the population is younger than 24 years of age. Huslia is blended Athabascan community, and about 95.2 percent of residents recognize themselves as Alaska Native. The male and female composition is approximately 52.6 and 47.4 percent respectively. The 2000 census revealed that there are 111 households with the average household

having approximately 3.33 individuals. The most recent 2008 Department of Commerce, Community and Economic Development (DCCED) certified population is 277. Figure 3-2 illustrates the historic population of the City of Huslia.

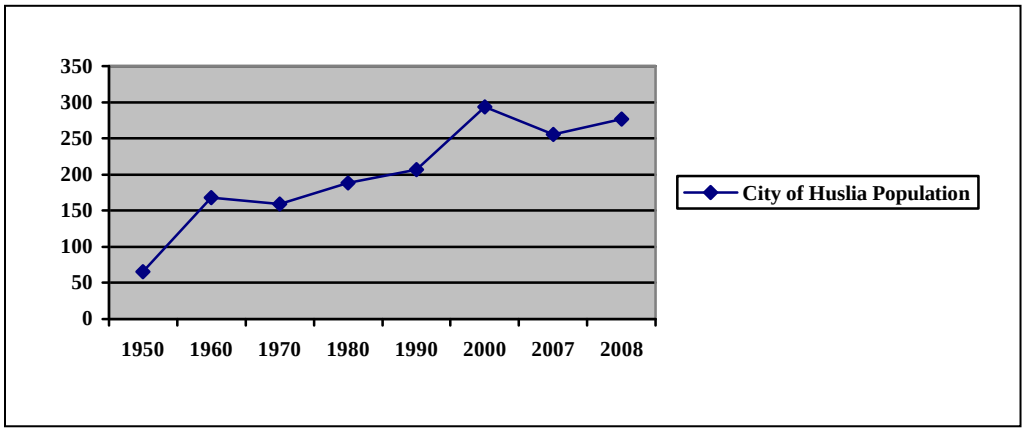

Figure 3-2 Huslia Historic Population

3.3 ECONOMY

There are limited employment opportunities in the City of Huslia. Established government provides the bulk of the employment opportunities such as the City and Tribal Offices, the school district, the health clinic, and other commercial enterprises along with fish processing and commercial fishing. The summer months bring fire fighting and outside construction job opportunities. However subsistence is the primary mechanisms by which the residents survive (DCRA 2009).

According to the 2000 census, the median household income in Huslia was $27,000. Approximately 85 individuals (28.1 percent) were reported to be living below the poverty level. The potential work force (those aged 16 years or older) in Huslia was estimated to be 188, of which 94 were actively employed. In 2000 the unemployment rate was 11.2 percent; however, this rate included part-time and seasonal jobs, and practical unemployment or underemployment is likely to be significantly higher.

Figure 3-3 is an aerial photograph supplied by the U.S. Army Corp of Engineers depicting the City of Huslia's street layout in relation to Mingoguit Lake (the City's flood source) and the Koyukuk River (severe erosion impact).

Figure 3-3 City of Huslia, September 17, 2007.

This section provides an overview of the planning process; identifies the Planning Team members and key stakeholders; documents public outreach efforts; and summarizes the review and incorporation of existing plans, studies, and reports used to develop this HMP. Additional information regarding the Planning Team and public outreach efforts is provided in Appendix C.

The requirements for the planning process, as stipulated in DMA 2000 and its implementing regulations are described below:

DMA 2000 Requirements: Planning Process

Local Planning Process

Requirement §201.6(b): An open public involvement process is essential to the development of an effective plan.

In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

Element

- An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
- An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and nonprofit interests to be involved in the planning process; and
- Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.6(c)(1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Element

- Does the plan provide a narrative description of the process followed to prepare the new or updated plan?
- Does the new or updated plan indicate who was involved in the planning process?
- Does the new or updated plan indicate how the public was involved?
- Does the new or updated plan discuss the opportunity for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process?
- Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?
- *Does the updated plan document how the planning team reviewed and analyzed each section of the plan and whether each section was revised as part of the update process? (Not applicable until 2013 update)*

Source: FEMA, July 2008.

4.1 OVERVIEW OF PLANNING PROCESS

The first step in the planning process began with Mayor Speedy Sam appointing a local Planning Team in January 2009 with a Planning Team kickoff meeting held on January 13, 2009. During the meeting the Team identified resources, capabilities, and set the date for the public meeting. The Planning Team's role was discussed to include: acting as an advocate for the planning process, assisting with gathering information, and support for the public meeting and other public participation opportunities. There was also a brief discussion about hazards that affect the community such as erosion and floods, which are increasing in intensity.

The Planning Team held a public meeting on March 18, 2009. The hazard mitigation planning process was described and participants were asked to help identify hazards that affect the City and to also identify critical facilities.

In summary, the following five-step process took place from January 2009 through July 2009.

1. Organize resources: Members of the Planning Team identified resources, including staff, agencies, and local community members, who could provide technical expertise and historical information needed in the development of the hazard mitigation plan.
2. Assess risks: The Planning Team identified the hazards specific to Huslia, and with the assistance of a hazard mitigation planning consultant (URS), developed the risk assessment for the seven identified hazards. The Planning Team reviewed the risk assessment, including the vulnerability analysis, prior to and during the development of the mitigation strategy.
3. Assess capabilities: The Planning Team reviewed current administrative and technical, legal and regulatory, and fiscal capabilities to determine whether existing provisions and requirements adequately address relevant hazards.
4. Develop a mitigation strategy: After reviewing the risks posed by each hazard, the Planning Team developed a comprehensive range of potential mitigation goals and actions. Subsequently, the Planning Team identified and prioritized the actions to be implemented.
5. Monitor, evaluate, and update the plan: The Planning Team developed a process to ensure the plan was monitored to ensure it was used as intended while fulfilling community needs. The team then developed a process to evaluate the plan to compare how their decisions affected hazard impacts. They then outlined a method to share their successes with community members to encourage support for mitigation activities and to provide data for incorporating mitigation actions into existing planning mechanisms and to provide data for the plans five year update.

4.2 HAZARD MITIGATION PLANNING TEAM

The Planning Team consists of Mayor Speedy Sam, Elsie Vent, Lorraine Pavlick, Irene Peters, Jeanette Vent, and Harold Vent. The State of Alaska, Division of Homeland Security and Emergency Management (DHS&EM) provided funding and project oversight in coordination with DCRA who is managing a joint mapping project for the community. URS, DHS&EM's contractor, provided assistance to the Planning Team. Table 4-1 identifies the hazard mitigation Planning Team.

Table 4-1 Hazard Mitigation Planning Team

NAME	TITLE	ORGANIZATION	PHONE
Speedy Sam	City Mayor	City of Huslia	829-2266
Elsie Vent: Team Leader	City Administrator	City of Huslia	829.2266
Lorraine Pavlick	Council Member	City of Huslia	829-2400
Irene Peters	Council Member	City of Huslia	829.2212
Jeanette Vent	Community Member	Private Citizen	829.2494
Harold Vent	Community Member	Private Citizen	829.2244
Scott Simmons	Planner/Consultant	URS Corporation	562.3366
Laura Young	Planner/Consultant	URS Corporation	562.3366
Mark Roberts	State Hazard Mitigation Officer	DHS&EM	428.2337
Ervin Petty	Mitigation Specialist	DHS&EM	428.2337
Ruth St. Amour	Government Planner	DCRA	269.4527
Keith Jost	Natural Resources Specialist	DCRA	269.4548

4.3 PUBLIC INVOLVEMENT AND OPPORTUNITIES FOR INTERESTED PARTIES TO PARTICIPATE

Table 4-2 Public Involvement Mechanisms

Mechanism	Description
Newsletter #1 Distribution (April 10, 2009)	In April 2009, the jurisdiction distributed a newsletter describing the upcoming planning activity. The newsletter encouraged the whole community to provide hazard and critical facility information. It was delivered door-to-door to ensure everyone received a copy.
Public Meeting	On March 26, 2009, public meeting introduced planning project to community.
Public Meeting	On June 10, 2009, public meeting to review and prioritize mitigation actions.
Newsletter #2 Distribution (September 4, 2009)	In September 2009, the jurisdiction distributed a second newsletter describing the draft HMP review opportunity with special emphasis for reviewing the proposed mitigation action plan matrix delineating potential project opportunities. The newsletter further encouraged the whole community to become involved in the HMP process.

A public meeting was held on March 6, 2009 to introduce the hazard mitigation planning project to the community and other interested parties. An invitation was extended to all individuals and entities identified on the project mailing list via a project newsletter describing the planning process and announcing the upcoming public meeting. A newsletter was developed and was either faxed or emailed to relevant academia, nonprofits, and local, State, and Federal agencies on April 10, 2009. The newsletter was placed on the DSH&EM website and signs posted throughout the community announcing the public meeting.

During the meeting, the Planning Team led the attending public through a hazard identification and screening exercise. The attendees identified seven potential hazards for profiling (drought, earthquake, erosion, flood, landslide, permafrost, severe weather, and wildland fire).

Following the hazard screening process, the Planning Team led the attendees through the process of identifying critical facilities in the community. URS also described the specific information needed from the Planning Team and public to complete the risk assessment including the location, value, and population of residents and critical facilities in the community.

After the community asset data was collected by the Planning Team over the spring of 2009, a risk assessment was completed that illustrated the assets that are exposed and vulnerable to specific hazards.

A second public meeting was held on June 10, 2009 to review and prioritize the mitigation actions identified based on the results of the risk assessment. A second newsletter was prepared and distributed on September 4, 2009 describing the process to date, presenting the prioritized mitigation actions, and announcing the availability of the draft HMP for public review and comment.

4.4 INCORPORATION OF EXISTING PLANS AND OTHER RELEVANT INFORMATION

During the planning process, the Planning Team reviewed and incorporated information from existing plans, studies, reports, and technical reports into the HMP. The following were reviewed and used as references for the jurisdiction information and hazard profiles in the risk assessment of the HMP for the City of Huslia:

- *U.S. Army Corps of Engineers, 2009 Alaska Baseline Erosion Assessment, Erosion Information Paper – Huslia, Alaska. September 17, 2007: provides an explanation of the City's erosion threat.*
- *Huslia Comprehensive Community Development Plan, 1999: explains the City's land use initiatives.*
- *Huslia Business Plan: Lists the community's business goals, future infrastructure needs and provided a map showing their riverine erosion and lake flood areas.*
- *Huslia Sanitation Facilities Improvement Plan, 2001: defines the current and future sanitation growth needs and provides erosion rate information.*
- *State of Alaska, Department of Commerce, Community and Economic Development Community Profile: Provided community demographic data.*
- *Bureau of Indian Affairs Road Inventory: Lists which roads fall under BIA responsibility for repair and maintenance.*

A complete list of references consulted is provided in Section 9.

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This section identifies and profiles the hazards that could affect the City of Huslia.

5.1 OVERVIEW OF A HAZARD ANALYSIS

A hazard analysis includes the identification, screening, and profiling of each hazard. Hazard identification is the process of recognizing the natural events that threaten an area. Natural hazards result from unexpected or uncontrollable natural events of sufficient magnitude. Human, Technological, and Terrorism related hazards are beyond the scope of this plan. Even though a particular hazard may not have occurred in recent history in the study area, all natural hazards that may potentially affect the study area are considered; the hazards that are unlikely to occur or for which the risk of damage is accepted as being very low, are eliminated from consideration.

Hazard profiling is accomplished by describing hazards in terms of their nature, history, magnitude, frequency, location, extent, and probability. Hazards are identified through historical and anecdotal information, existing plans, studies, and hazard maps collection and review for the study area. Hazard maps are used to determine the geographic extent of the hazards and define the approximate boundaries of the areas at risk.

5.2 HAZARD IDENTIFICATION AND SCREENING

The requirements for hazard identification, as stipulated in DMA 2000 and its implementing regulations are described below.

DMA 2000 Requirements: Risk Assessment: Identifying Hazards

Identifying Hazards

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type of all natural hazards that can affect the jurisdiction.

Element

- Does the new or updated plan include a description of the types of all natural hazards that affect the jurisdiction?

Source: FEMA, July 2008.

For the first step of the hazard analysis, the Planning Team identified 11 possible hazards that could affect the City of Huslia. They then evaluated and screened the comprehensive list of potential hazards based on a range of factors, including prior knowledge or perception of the relative risk presented by each hazard, the ability to mitigate the hazard, and the known or expected availability of information on the hazard (see Table 5-1). The Planning Team determined that seven hazards pose the greatest threat to the City: drought, earthquake, erosion, flood, permafrost, severe weather, and wildland fire. The remaining hazards excluded through the screening process were considered to pose a lower threat to life and property in the City due to the low likelihood of occurrence or the low probability that life and property would be significantly affected.

Table 5-1 Identification and Screening of Hazards

HAZARD TYPE	SHOULD IT BE PROFILED?	EXPLANATION
Avalanche	No	This hazard does not exist for the City.
Drought	Yes	Dry seasons prevent sufficient groundwater for essential berry and subsistence food growth. Insufficient water also reduces food sources for wild game and reduces river water replenishments. Reduced water depth increased water temperature; high water temperature reduces fish fry survivability. Consequently, drought seasons have a direct negative impact preventing wild food, fish, or wild game availability for harvesting. This creates a negative impact to essential subsistence requirements.
Earthquake	Yes	Periodic, unpredictable occurrences. The City has experienced numerous slight tremors from close proximity earthquakes.
Erosion (Riverine)	Yes	During high water events, ice jam scouring, and normal river current flow as the City is located on the outside bend Koyukuk River. The City has approximately ½ mile embankment exposure to erosion activity.
Flood	Yes	The City is situated above the historic floodplain. However, the City does experience recurrent flooding from Mingoguit Lake located along its northern edge.
Landslide/Debris Flow	No	This hazard does not exist for the City.
Permafrost	Yes	Discontinuous permafrost is present throughout the City but is more prevalent at the northeastern part of the City.
Tsunami	No	This community is located too far inland to experience the damaging affects of a tsunami. Neither does this community have geologic formations which would create a seiche threat.
Volcanic Hazards	No	This hazard does not exist for the City.
Weather (Severe)	Yes	Annual weather patterns, severe cold, freezing rain, and snow accumulations are predominate threats. The snowfall amount directly determines winter weather damages. Less snow causes frost line deepen resulting in frozen water and sewer pipes. More snow provides better ground insulation. Severe cold usually occurs during December-January. High winds typically occur from February-March and August-September. August experiences the most rain. Too much rain causes wild game to move to more distant dry ground way from the City increasing resident travel to harvest subsistence foods. Heavy rain and spring thaw causes high river water which reduces the City's residents' capability to harvest King salmon for subsistence needs.
Wildland Fire (Wildland/Urban Interface)	Yes	Historic wildfire occurrences during summer dry season (April-October). The City is bordered on two sides by scrub growth and low fuels making the wildfire urban interface hazardous.

5.3 HAZARD PROFILE

The requirements for hazard profiles, as stipulated in DMA 2000 and its implementing regulations are described below:

DMA 2000 Requirements: Risk Assessment – Profiling Hazards

Profiling Hazards

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Element

- Does the risk assessment identify the location (i.e., geographic area affected) of each natural hazard addressed in the new or updated plan?
- Does the risk assessment identify the extent (i.e., magnitude or severity) of each hazard addressed in the new or updated plan?
- Does the plan provide information on previous occurrences of each hazard addressed in the new or updated plan?
- Does the plan include the probability of future events (i.e., chance of occurrence) for each hazard addressed in the new or updated plan?

Source: FEMA, July 2008.

The specific hazards selected by the Planning Team for profiling have been examined in a methodical manner based on the following factors:

- Nature
- History
- Location
- Extent (to include magnitude and severity)
- Impact (general impacts associated with each hazard are described in the following profiles – detailed impacts to City of Huslia residents and critical facilities are further described in Section 6 as part of the overall vulnerability summary for each hazard)
- Probability of future events

Each hazard is assigned a rating based on the following criteria for probability (Table 5-2) and magnitude/severity (Table 5-3).

Table 5-2 Hazard Probability Criteria

PROBABILITY	CRITERIA
4 - Highly Likely	Event is probable within the calendar year. Event has up to one in one year chance of occurring (1/1=100%). History of events is greater than 33% likely per year. Event is "Highly Likely" to occur.
3 - Likely	Event is probable within the next three years. Event has up to one in three years chance of occurring (1/3=33%). History of events is greater than 20% but less than or equal to 33% likely per year. Event is "Likely" to occur.
2 - Possible	Event is probable within the next five years. Event has up to one in five years chance of occurring (1/5=20%). History of events is greater than 10% but less than or equal to 20% likely per year. Event could "Possibly" occur.
1 - Unlikely	Event is possible within the next 10 years. Event has up to one in ten years chance of occurring (1/10=10%). History of events is less than or equal to 10% likely per year. Event is "Unlikely" but is possible of occurring.

Probability is determined based on historic events, using the criteria identified above, to provide the likelihood of a future event.

Table 5-3 Hazard Magnitude/Severity Criteria

MAGNITUDE / SEVERITY	CRITERIA
4 - Catastrophic	Multiple deaths. Complete shutdown of facilities for 30 or more days. More than 50% of property is severely damaged.
3 - Critical	Injuries and/or illnesses result in permanent disability. Complete shutdown of critical facilities for at least two weeks. More than 25% of property is severely damaged.
2 - Limited	Injuries and/or illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than one week. More than 10% of property is severely damaged.
1 - Negligible	Injuries and/or illnesses are treatable with first aid. Minor quality of life lost. Shutdown of critical facilities and services for 24 hours or less. Less than 10% of property is severely damaged.

Similar to estimating probability, magnitude, and severity are determined based on historic events using the criteria identified above.

The hazards profiled for the City of Huslia are presented in the rest of Section 5.3. The order of presentation does not signify the level of importance or risk.

5.3.1 Drought

Nature

The US Geological Survey defines drought as a period of abnormally dry weather creating hydrologic imbalance, shortage of precipitation adversely affecting crops, or a period of below average water in streams and lakes, reservoirs, aquifers, and soils (USGS 2008). There is no universal measure of precipitation or dryness that signifies drought. Historically, droughts have been seen as unpredictable and unavoidable events. Drought severity depends on duration,

intensity, and geographic extent, as well as the demand on the water supply. Climate fluctuations occur everywhere, and periods of low precipitation are a normal, recurrent feature of climate. Droughts are rare in Alaska.

A drought may result in crops not maturing (both wild and agricultural), land values declining, and livestock (and wildlife) becoming malnourished, increases in unemployment, and contribute to an increased wildland fire hazard. It can also lead to a shortage of water for residential, industrial, recreational, and navigational purposes (and adversely impact fish habitat) (DHS&EM, 2007).

The Oregon Natural Hazards Workgroup research states that other direct environmental effects of drought include livestock (and wildlife) death or decreased production, wildland fire, impaired productivity of forest land, damage to fish habitat and reduced fish return rates, loss of wetlands, and air quality effects. Indirect effects to society are measured by the economic and physical hardships brought on by drought and by the increased stress on residents of a drought-stricken area (ONHW 2004). The economic impact of drought is estimated between $6 and $8 billion annually in the United States (US). These costs primarily affect agricultural, forestry, fisheries, recreation and tourism, transportation and energy sectors. Drought is also associated with insect infestation, disease, and wind erosion (ONHW 2006).

This hazard is complicated because there is no easily identifiable beginning or end and because the impacts are not very obvious and can affect a wide area. There are four ways to define drought:

- Meteorological: a degree of dryness. Measures lack of actual precipitation compared to an expressed average
- Agricultural: defined as soil moisture deficiencies relative to what the plant life needs
- Hydrological: relates to the effects of the lack of precipitation on streams, rivers, lakes, and groundwater levels
- Socioeconomic: the demand for water is greater than the supply. This results from a reduction in supply, an increase in demand, or both

The City of Huslia is very aware of their environment and how weather fluctuations affect subsistence crop viability, normal wildlife patterns, and subsistence fish return rates. Reduced precipitation directly affects the City's food sources and determines if residents will need to find alternate food sources to enable them to survive the long winter season. The City of Huslia is not connected to a road system to facilitate supply transport. Consequently, the only alternative to subsistence is having food flown or transported in from commercial food vendors and shipping companies which is a very expensive alternative.

5.3.1.1 History

Drought occurs sporadically throughout Alaska which affects subsistence and agricultural enterprises. Environmental consequences also include insect infestations in forests, insufficient stream flows to support fish species, and increased fire susceptibility.

Researchers reviewed the relationship between drought and forest fires from 1959 -1999 and found a direct correlation. The years 1963, 1969, 1989, and 1995 experienced less than normal

precipitation, while experiencing high temperatures and increased fire incidents. These were good indicators for drought. The researchers stated, "This relationship between drought affected area and area burned suggests that drought may have affected the annual area burned in Canada and Alaska, and area burned increased exponentially with drought affected areas." (Xiao & Zhuang 2007)

The City of Huslia's Planning Team indicated that drought is a cyclic part of the climate. The summers of 1955, 1965, and 1989 were especially severe causing subsistence herds to change their behavior patterns to the north and south of the City where water and feed were available. Berry picking was very bad requiring residents to purchase these food sources from outside community commercial vendors.

5.3.1.2 Location, Extent, Impact, and Probability of Future Events

Location

Drought occurs in every climate zone and varies from region to region. Droughts occur in all parts of Alaska, and have a profound negative impact on rural communities' subsistence requirements. Drought affects the entire region surrounding the City of Huslia, periodically reducing wild berry harvests, wildlife availability, and water resources.

Dry seasons prevent sufficient groundwater for essential berry and subsistence food growth. Insufficient water also reduces food sources for wild game and fowl and reduces river water replenishments. Reduced water depth increases water temperature which reduces fish fry survivability. Consequently, drought has a direct negative impact preventing wild food, fish, or wild game from being available for harvesting to meet subsistence needs.

Ms. Elsie Vent, Planning Team Leader stated, "There were years when we had no berries of any kind .... We had to buy frozen berries from the stores when they had them on stock, which was not very often. These were years when we had hardly any snow or rain…where everything [subsistence herds and flocks] went south or north [to find food]."

Extent

The severity of drought depends on the degree of moisture deficiency, duration, and size of the affected area. A community's food gathering and wildlife subsistence requirements are usually the first to experience impacts of drought because of their dependence on soil moisture.

Drought events have additional magnitude and severity criteria as those listed in Table 5-3. This hazard extends to limiting available subsistence foods requiring residents to purchase required daily staples. Food and delivery transportation costs are very high with sometimes lengthy delivery times.

Based on the Planning team's knowledge of past drought events and the criteria identified in Table 5-3, the extent of drought impacts in the City of Huslia are considered negligible. The community will experience minor quality of life loss, and shutdown of critical facilities and services for 24 hours or less and where less than ten percent of property is severely damaged.

Impacts

Drought damages include decreased subsistence food source availability, reduced fish return rates, and result in excess travel costs to access subsistence herds and flocks. Reduced food source availability result in excessive expenditures for both replacement food sources and their shipping costs due to the City's rural location.

Probability of Future Events

The Planning Team stated that drought recurrence probability follows the criteria in Table 5-2 where the probability of future drought events is possible in the next five years (event has up to 1 in 5 years chance of occurring) as the history of events is greater than 10 per cent but less than or equal to 20 percent likely per year.

5.3.2 Earthquake

5.3.2.1 Nature

An earthquake is a sudden motion or trembling caused by a release of strain accumulated within or along the edge of the earth's tectonic plates. The effects of an earthquake can be felt far beyond the site of its occurrence. Earthquakes usually occur without warning and after only a few seconds can cause massive damage and extensive casualties. The most common effect of earthquakes is ground motion, or the vibration or shaking of the ground during an earthquake.

Ground motion generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. An earthquake causes waves in the earth's interior (i.e., seismic waves) and along the earth's surface (i.e., surface waves). Two kinds of seismic waves occur: P (primary) waves are longitudinal or compressional waves similar in character to sound waves that cause back and forth oscillation along the direction of travel (vertical motion), and S (secondary) waves, also known as shear waves, are slower than P waves and cause structures to vibrate from side to side (horizontal motion). There are also two types of surface waves: Raleigh waves and Love waves. These waves travel more slowly and typically are significantly less damaging than seismic waves.

In addition to ground motion, several secondary natural hazards can occur from earthquakes such as:

- **Surface Faulting** is the differential movement of two sides of a fault at the earth's surface. Displacement along faults, both in terms of length and width, varies but can be significant (e.g., up to 20 feet [ft]), as can the length of the surface rupture (e.g., up to 200 miles). Surface faulting can cause severe damage to linear structures, including railways, highways, pipelines, and tunnels.
- **Liquefaction** occurs when seismic waves pass through saturated granular soil, distorting its granular structure, and causing some of the empty spaces between granules to collapse. Pore water pressure may also increase sufficiently to cause the soil to behave like a fluid for a brief period and cause deformations. Liquefaction causes lateral spreads (horizontal movements of commonly 10 to 15 ft, but up to 100 ft), flow failures (massive flows of soil, typically hundreds of feet, but up to 12

miles), and loss of bearing strength (soil deformations causing structures to settle or tip). Liquefaction can cause severe damage to property.

- **Landslides/Debris Flows** occur as a result of horizontal seismic inertia forces induced in the slopes by the ground shaking. The most common earthquake-induced landslides include shallow, disrupted landslides such as rock falls, rockslides, and soil slides. Debris flows are created when surface soil on steep slopes becomes totally saturated with water. Once the soil liquefies, it loses the ability to hold together and can flow downhill at very high speeds, taking vegetation and/or structures with it. Slide risks increase after an earthquake during a wet winter.

The severity of an earthquake can be expressed in terms of intensity and magnitude. Intensity is based on the damage and observed effects on people and the natural and built environment. It varies from place to place depending on the location with respect to the earthquake epicenter, which is the point on the earth's surface that is directly above where the earthquake occurred. The severity of intensity generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. The scale most often used in the U.S. to measure intensity is the Modified Mercalli (MM) Intensity Scale. As shown in Table 5-4, the MM Intensity Scale consists of 12 increasing levels of intensity that range from imperceptible to catastrophic destruction. Peak ground acceleration (PGA) is also used to measure earthquake intensity by quantifying how hard the earth shakes in a given location. PGA can be measured as acceleration due to gravity (*g)* (see Table 5-4) (MMI 2006).

Magnitude (M) is the measure of the earthquake strength. It is related to the amount of seismic energy released at the earthquake's hypocenter, the actual location of the energy released inside the earth. It is based on the amplitude of the earthquake waves recorded on instruments, known as the Richter magnitude test scales, which have a common calibration (see Table 5-4).

Table 5-4 Magnitude / Intensity / Ground-Shaking Comparisons

MAGNITUDE	INTENSITY	PGA (% *g*)	PERCEIVED SHAKING
0 – 4.3	I	<0.17	Not Felt
	II-III	0.17 – 1.4	Weak
4.3 – 4.8	IV	1.4 – 3.9	Light
	V	3.9 – 9.2	Moderate
4.8 – 6.2	VI	9.2 – 18	Strong
	VII	18 – 34	Very Strong
6.2 – 7.3	VIII	34 – 65	Severe
	IX	65 – 124	Violent
	X	124 +	Extreme
7.3 – 8.9	XI		
	XII		

(MMI 2006)

5.3.2.2 History

The Planning Team determined that the City of Huslia has had no historical damaging earthquake impacts. They subsequently decided to only be concerned with earthquake events which exceeded M5.0. Table 5-5 depicts a list of historical earthquakes from 1971 to present which exceeded M5.0 located within 100 miles of the City of Huslia. These earthquakes did not induce any major damage due primarily to their community structure types and foundation support system designs.

Table 5-5 Historical Earthquakes for the City of Huslia

(Highlight is earthquake of record)

CAT	YEAR	MO	DAY	ORIG TIME	LAT	LONG	DEPTH (Miles)	MAGNITUDE	DISTANCE (Miles)
PDE	1989	04	23	192106.47	66.96	-156.29	3.7	5.3 MLPMR	87
PDE	1989	10	09	094112.59	66.94	-156.51	3	5.1 MLPMR	86
138	2000	02	03	102459.03	65.01	-154.24	4.3	5.7	78

(USGS 2009)

The City of Huslia has no history of damaging earthquakes. Since 1971, 336 earthquakes have been recorded within a 100 mile radius of the City of Huslia. The average magnitude of these earthquakes is 3.6. The largest recorded earthquake within 100 miles of the City of Huslia measured M5.7 on February 3, 2000, and caused no damage to critical facilities, residences, non-residential buildings, or infrastructure.

North America's strongest recorded earthquake occurred on March 27, 1964, measuring M9.2 and was felt by many residents throughout Alaska. The City of Huslia felt ground motion resulting from this historic event; however, no local damage occurred.

5.3.2.3 Location, Extent, Impact, and Probability of Future Events

Location

The entire geographic area of Alaska is prone to the effects of an earthquake. Peter Haeussler, Alaska Region USGS explained during a telephone conversation, the Kaltag Fault follows the Yukon River and is relatively centered on the Koyukuk/Yukon River confluence.

The Kobuk Fault Zone comprises a fault system of smaller faults; located north of Alatna Village running east to west along the border of the Brooks Range (GSA 1998).

The City of Huslia lies between the Kaltag and Kobuk Faults and can expect to be impacted by earthquake events. Figure 5-1 shows the locations of active and potentially active faults in Alaska.

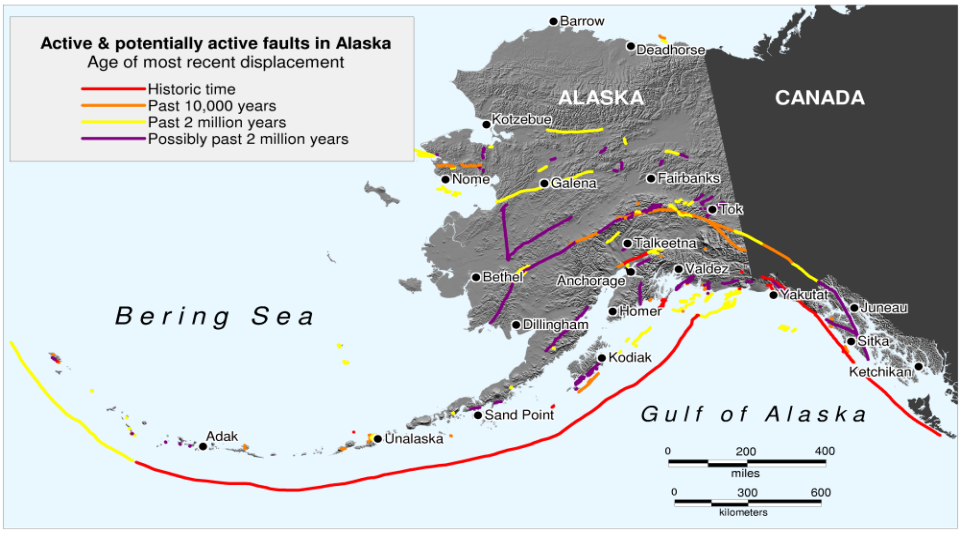

Figure 5-1 Active and Potentially Active Faults in Alaska

Of the 336 recorded earthquakes since 1977, two exceeded M5.0. The largest one recorded was M5.7 which occurred on February 3, 2000 at a depth of 4.3 miles. The epicenter was located approximately 78 miles from the City of Huslia (USGS 2009).

Extent

The Kaltag fault is a strike slip fault which produces intense earthquakes and can potentially produce a large magnitude earthquake, while the left lateral Kobuk fault zones produces interplate earthquakes. Both fault types occur along the boundary of tectonic plates. These types of earthquakes can have magnitudes with varying intensity greater than M7.0 (GSA 1998).

Earthquakes felt in the City of Huslia area have not exceeded M5.7 in the past 31 years, and damage has never been reported due to an earthquake event.

Based on historic earthquake events and the criteria identified in Table 5-3, the magnitude and severity of earthquake impacts in the City of Huslia are considered negligible. Residents may experience minor injuries, the potential exists for critical facilities to be shutdown for less than 24 hours, and less than ten percent of property or critical infrastructure being severely damaged with little to no permanent damage to transportation, infrastructure, or the economy.

Impact

City of Huslia is located in an area that is less active than others in the State, although the effects of earthquakes centered elsewhere are expected to be felt in City of Huslia. Impacts to the community such as significant ground movement that may result in infrastructure damage are not expected. Minor shaking may be seen or felt based on past events. Impacts to future populations, residences, critical facilities, and infrastructure are anticipated to remain the same.

Probability of Future Events

The City of Huslia has no official record of significant earthquake activity resulting in damage or injuries. While it is not possible to predict when an earthquake will occur, Figure 5-2 was generated using the USGS Earthquake Mapping model and indicates approximately a 7 percent

probability of a M5.0 or greater earthquake occurring within 10 years and 31 miles (50 kilometers) of the City of Huslia.

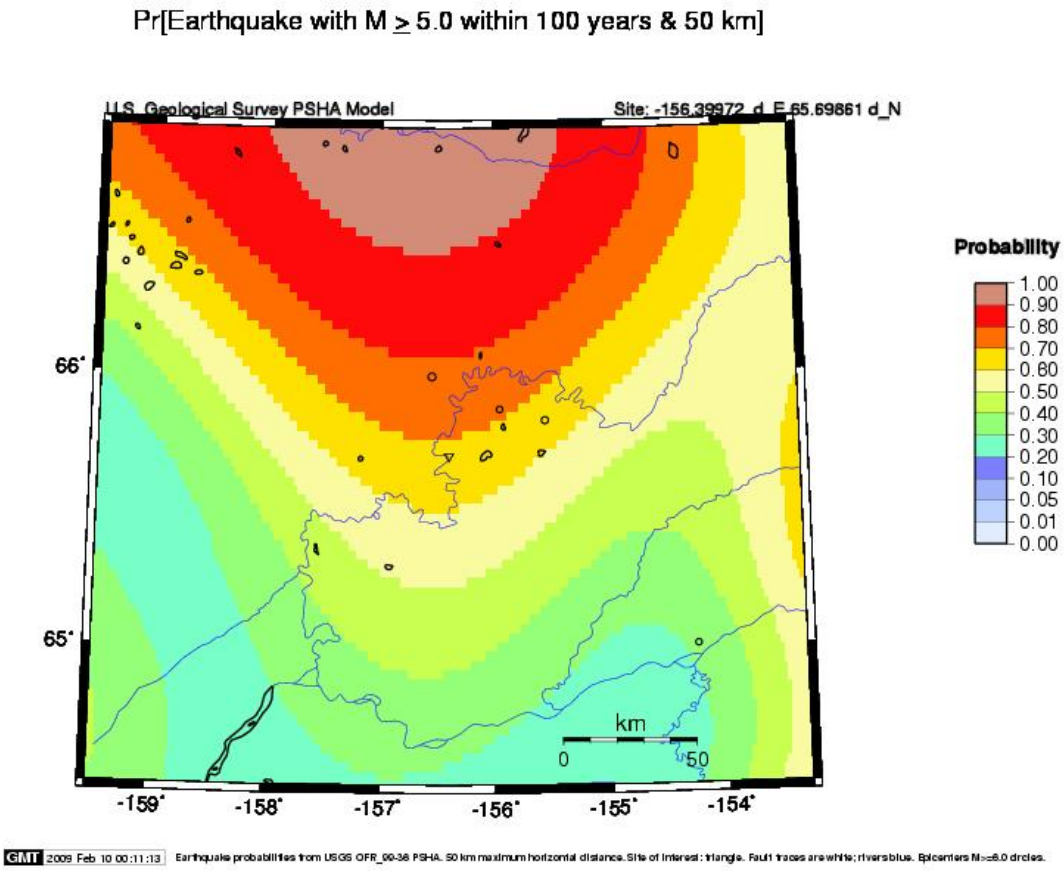

Figure 5-2 Huslia Earthquake Probability (USGS 2009)

This 2002 shake map is the most current map available for this area. However, it is a viable representation to support probability inquiries. According to Peter Haeussler, USGS, Alaska Region:

> *"The occurrence of various small earthquakes does not change earthquake probabilities. In fact, in the most dramatic case, the probability of an earthquake on the Denali fault was/is the same the day before the 2002 earthquake as the day afterward. Those are time-independent probabilities. The things that change the hazard maps is changing the number of active faults or changing their slip rate. For… [the City of Huslia], I don't think anything has changed." (Haeussler 2009)*

5.3.3 Erosion

5.3.3.1 Nature

Erosion rarely causes death or injury. However, erosion causes the destruction of property, development and infrastructure. Erosion is the wearing away, transportation, and movement of land. It is usually gradual but can occur rapidly as the result of floods, storms or other event or

slowly as the result of long-term environmental changes. Erosion is a natural process, but its effects can be exacerbated by human activity.

Riverine erosion is a problem in developed areas where disappearing land threatens development and infrastructure. Riverine erosion is a major threat to the City as it threatens the embankment, structures, and the subsistence livelihood of the City of Huslia.

Riverine erosion results from the force of flowing water and ice formations in and adjacent to river channels. This erosion affects the bed and banks of the channel and can alter or preclude any channel navigation or riverbank development. In less stable braided channel reaches, erosion, and deposition of material are a constant issue. In more stable meandering channels, episodes of erosion may only occur occasionally.

5.3.3.2 History

The City of Huslia's Comprehensive Plan… states,

> *"Past erosion control and bank stabilization efforts have largely been unsuccessful. Several homes that were near the riverbank have been relocated due to continuing erosion… it is difficult to predict future erosion lines. Three studies have included estimates of erosion rates*
>
> - *The primary project summary from the 1962 US Public Health Service (USPHS) project (USPHS 1964) stated, "The riverbank is eroding at a rate of about 50 feet each year, and represents a serious erosion problem that might respond to river control."*
> - *The 1973 PHS project summary (USPHS 1980) stated, "The City has faced problems of bank erosion in the past and several houses have been relocated due to the erosion activities of the river. Within the past six years, however, the riverbank erosion has decreased because of the deposition of the sandbar in front of the City."*
> - *A 1990 wastewater collection and disposal feasibility study (CRW 1990) depicted an estimated erosion line on maps of alternatives. No details were provided on how the line was estimated.*
>
> *…The location of the predicted riverbank line was estimated based on an average of 10-feet per year erosion rate… all predictions are merely speculative." (Huslia, 1999).*

The USACE erosion assessment stated the Koyukuk River's flood state "erodes the sandy, erosion-prone soils under the community… The most active erosion area is estimated to be 2,000 ft along the 20 foot high riverbank. The community survey indicates the riverbank has been eroding at an estimated rate of 10 to 30 ft per year, but substantially greater rates have been reported during recent break-up flooding. The survey reported that the river eroded 2,000 ft of bank inland 60 ft in May of 2003, 100 ft in 2004, and 80 ft in 2005." (USACE 2009b)

Ms. Elsie Vent, Huslia City Administrator, reported during the May 2009 State declared spring break-up flood event that they "lost another 200 ft by 40 ft section removing a portion of the road located along the river bank." (This event is ongoing during this writing and the final erosion loss is undetermined.)

Ms. Vent further stated, "One of the Village elders lives in a house on the opposite side of the road directly adjacent to the eroded area. The community has raised the house in

preparation of moving it should the embankment erode further. However the family does not have funding to move it." Ms. Vent and the City Planning Team are very concerned about their erosion threat. They strongly stated "erosion is the City's greatest natural hazard threat." The City Planning Team stated that high flowing flood-waters erode the stream banks underlying permafrost resulting in bank collapse. As the embankment collapses it perpetually exposes fresh permafrost and the cycle begins again. This cycle causes extensive riverbank loss during each high water/high flow flood event (Huslia 2009).

The Koyukuk River has claimed a large portion of the City of Huslia as its embankment eroded over a 30 year period. The City of Huslia provided a copy of a 1975 community map (Figure 5-3) showing current erosion line and structure locations. The yellow line indicates the existing Koyukuk River embankment and its relationship to community structures (green dots). The pink dots indicate structures the community relocated as the embankment eroded. The community has had a proactive approach to river erosion – moving structures before they fall into the river. However, the number of structures facing imminent loss is rapidly increasing. The City is concerned about how it can relocate so many structures in the near future.

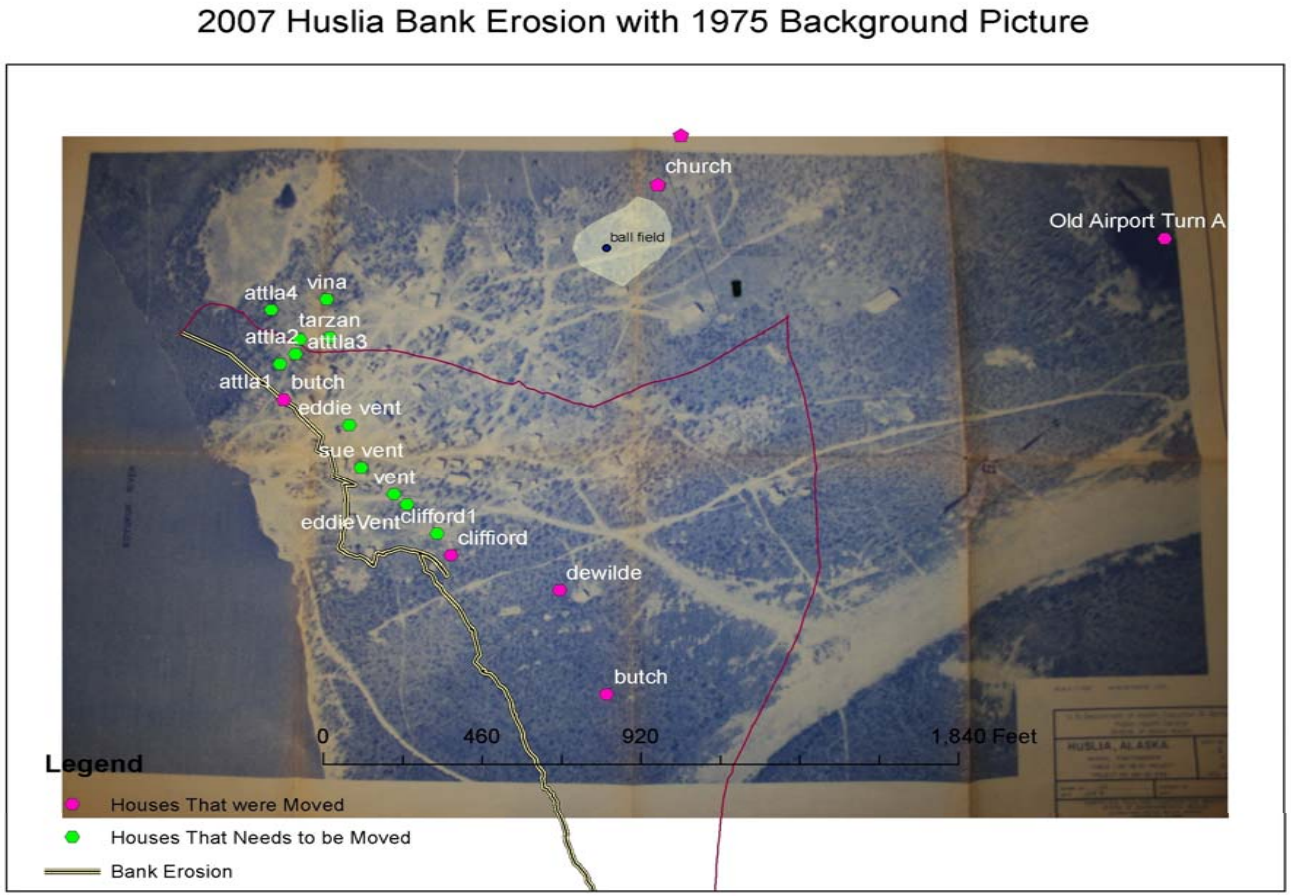

Figure 5-3 Huslia Historical Erosion Line (Line indicated current river bank location)

The Koyukuk River does not flood the City as the City is approximately 20 ft higher than the river. However, the City experiences severe stream bank undercut erosion along the 2,000 ft stretch of embankment adjacent to the City's infrastructure. High water flows during the May 2009 spring break-up caused embankment undercutting erosion along a 200 ft long stretch, 40 ft deep cut removing part of the road closest to the river (Figure 5-4).

Figure 5-4 City of Huslia Riverbank Erosion

5.3.3.3 Location, Extent, Impact, and Probability of Future Events

Location

The City of Huslia Comprehensive Community Development Plan, 1999 states, "Erosion is a serious problem in Huslia. Past erosion control and bank stabilization efforts have been largely unsuccessful. Several homes that were near the riverbank have been relocated due to continuing erosion. Erosion, however, has not been consistent; therefore, it is difficult to predict future erosion lines." (Huslia 1999)

Riverine erosion hazards have increased dramatically over the years. Erosion is now directly impacting the City's infrastructure. Factors that influence erosion include flooding, spring break-up, and melting permafrost. The riverbanks adjacent to the City are essential to the lives of the residents. According to the USACE Erosion Survey, "three homes; several outbuildings and sheds; a number of water tanks and water lines, fuel tanks, food storage areas, including drying racks, and smokehouses; a retail store; a roadway, boardwalk, and other community pathways; boat launches and boat storage and repair structures; a number of utility poles for power, telephone, and cable; and sewer lines [are threatened]" (USACE 2009b). Figure 5-5 is an aerial photo supplied by the community showing the current embankment's location where erosion is now threatening the community.

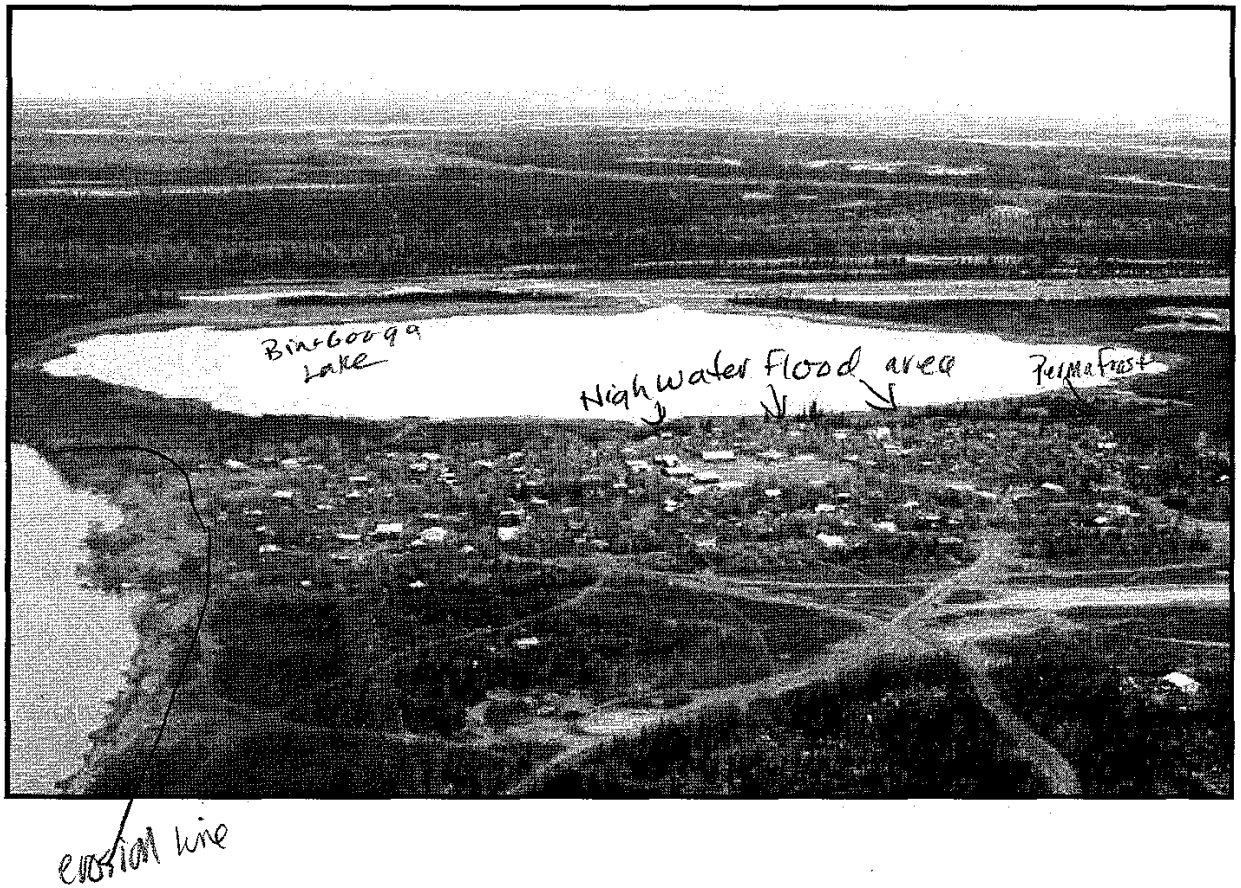

Figure 5-5 Aerial Photo supplied by the City of Huslia

(From their Draft Business Plan; Water, Sewer, and Solid Waste System, May 6, 2008, annotated to show their riverine erosion and lake flood areas).

Extent

A variety of natural and human-induced factors influence the erosion process within the community. River orientation and proximity to up and downstream river bends can influence erosion rates. Embankment composition also influences erosion rates, as sand and silt will erode easily, whereas boulders or large rocks are more erosion resistant. Other factors that may influence riverine erosion include:

- Geomorphology
- Amount of encroachment in the high hazard zone
- Proximity to erosion inducing structures
- Nature of the topography
- Density of development
- Structure types along the embankment
- Embankment elevation

Erosion in the City of Huslia usually removes small areas at a time. The embankment soil is primarily silty sand and undercut by fast flowing waters during spring thaw. Significant events have caused infrastructure and home losses or required infrastructure and residential relocations. Erosion embankment loss has not been consistent over time; the upper end of the village has lost approximately 150 ft, but the south embankment loss increases to approximately 450 ft. The City estimates an average loss of over 225 ft have been lost in the past 30 years. Development along the 20 foot high river bank has been sparse with residences relocated as the embankment receded.

The USACE lists the City of Huslia's erosion threat as a "Priority Action. Erosion is threatening the viability of the community, significant resources are being expended to minimize such threats, or both conditions are present...The erosion issue likely warrants immediate and substantial Federal, State, or other intervention. Priority Action Communities should be considered for immediate action in either initiating an investigation or continuing with ongoing efforts to manage erosion (USACE 2009b)."

Based on past events, the 2009 USACE Alaska Erosion Assessment, and the criteria identified in Table 5-3, the magnitude and severity of erosion impacts in the City of Huslia are considered "critical" with potential for critical facilities to be shutdown for at least two weeks, and more than 25 percent of property or critical infrastructure being severely damaged.

Impact

Impacts from erosion include loss of land and any development on that land. Erosion can cause increased sedimentation of river deltas and hinder channel navigation—affecting marine transport. Other impacts include reduction in water quality due to high sediment loads, loss of native aquatic habitats, damage to public utilities (fuel headers and electric and water/wastewater utilities), and economic impacts associated with the costs of trying to prevent or control erosion sites.

Probability of Future Events

Based on previous occurrences of 225 ft of embankment loss over the past 30 years we can expect an average rate of nearly ten ft per year. Applying the criteria identified in Table 5-2, it is highly likely that erosion will occur in the next year (event has up to 1 in 1 years chance of occurring) as the history of events is greater than 33 percent likely per year.

5.3.4 Flood

5.3.4.1 Nature

Flooding is the accumulation of water where usually none occurs or the overflow of excess water from a stream, river, lake, reservoir, glacier, or coastal body of water onto adjacent floodplains. Floodplains are lowlands adjacent to water bodies that are subject to recurring floods. Floods are natural events that are considered hazards only when people and property are affected.

Four primary types of flooding occur in the City of Huslia including: rainfall-runoff floods; snowmelt floods; ice jam floods; and ice overflow (aufeis) flooding.

Rainfall-Runoff Flood

Rainfall-runoff flooding occurs in late summer and early fall. The rainfall intensity, duration, distribution, and geomorphic characteristics of the watershed all play a role in determining the magnitude of the flood. Rainfall-Runoff flooding is the most common type of flood. This type of flood event generally results from weather systems that have associated prolonged rainfall.

Snowmelt Flood

Snowmelt floods typically occur in spring or early summer. The depths of the snow pack and spring weather patterns influence the magnitude of flooding.

Ice Jam Flood

Ice jam floods occur after an ice jam develops; thus, this type of flood can occur any time of the year that a river has ice on it. Ice jams can form during fall freeze up, in midwinter when stream channels freeze forming anchor ice, and during spring break-up when the existing ice cover gets broken into pieces and the pieces get stuck at bridges or other constrictions. Ice jams restrict water flow on a river or stream and form during the following three situations:

- fall freeze-up
- spring break-up(i.e., when the existing ice cover is broken into pieces that block flowing water at bridges or other constrictions)
- midwinter (i.e., when stream channels freeze forming anchor ice)

Ice jams commonly develop in areas where the channel slope decreases, becomes shallower, or where constrictions occur such as at bridges, bends in the river, headwaters, and reservoirs. Ice jams frequently impede water along big rivers during spring break-up.

Water levels increase upstream behind the location of the ice jam. The result is flooding of an area by creating a lake-like effect covering a large area. Little damage typically occurs from the water current upstream of the ice jam, but significant damage can result from flooding. However,

the downstream effect is very different. As soon as the ice jam is breached there is usually rapid draining of the dammed water. Downstream water levels rise substantially after the ice jam is breached and strong water currents are created, which can cause erosion and other significant damages. Additionally, the rising water causes the ice to float while increased velocities of water move the ice further downstream. The motion of large solid ice blocks is often destructive to natural and material property in the vicinities. When ice jams cause flood events during spring break-up, snowmelt can contribute to the flood. Notable large floods in recent years on the Kenai, Susitna, Kuskokwim, and Yukon rivers were all caused by ice jams and snowmelt.

Ice Overflow (Aufeis) Flood

Aufeis is glaciation or icing of streams and rivers, affecting road surfaces and infrastructure. Aufeis forms during the winter when emerging ground water freezes. Stream glacial flooding occurs when ice forms from the bottom up not from the top down, forcing water out of the stream channel. If aufeis occurs on a roadway, it makes travel difficult. For example, the Steese Highway frequently has an aufeis problem in the winter months. In the mid 1980s, several homes in Fox suffered from an aufeis event occurring at the wellhead. The homes flooded 6 ft deep, then froze.

Timing of events

Many floods are predictable based on rainfall patterns. Most of the annual precipitation is received from July through October with August being the wettest. This rainfall occasionally leads to lake overflow flooding in early/late summer and/or fall. Spring snowmelt increases runoff, which can cause flooding from the same lake source.

5.3.4.2 History

The City of Huslia is situated approximately 20 ft above the Koyukuk River. The worst flooding event occurred in the 1930s with the most recent event from a lake overflow event in 1989 which overtopped the westerly side of the old lagoon (Huslia 2009, USACOE 2009).

Koyukuk River flood events do not generally cause damage so much as it causes severe erosion. However, flood damages from Mingoguit Lake overflow impacting adjacent residents.

Table 5-6 summarizes the City's historic flood events.

Table 5-6 Historical Flood Events

Zone(s)	Location(s)	Date(s)	Event	Description
AK004		17-26 Aug 94	Flood	Rainfall caused flooding. The total estimate for restoration of the flooded villages on the rivers is $74K.
AK004	Alatna, Allakaket, Bettles, Evansville, Hughes, Huslia	26-31 May 98, 01 Jun 98	Flood	Rapid snowmelt flooding on the Koyukuk River. Koyukuk River high water flooded 1600 ft of a 4,000ft gravel runway at Allakaket, swept away one floatplane dock at Bettles, and 30 ft of bank and road from Bettles to Evansville (a mile or so away), Bank erosion at Huslia, though no structures were damaged.
AK216	Huslia	20-25 May 05	Flood	The Koyukuk River rose significantly from rain and snowmelt causing bank erosion at Huslia, one home

Table 5-6 Historical Flood Events

Zone(s)	Location(s)	Date(s)	Event	Description
				was threatened and several utility poles had to be moved. The river water flowed into an adjacent lake, causing minor flooding to several residences along the lakeshore.

(Lingaas, 2009)

5.3.4.3 Location, Extent, Impact, and Probability of Future Events

Location

The City of Huslia stated they have no flooding threat from the Koyukuk River. However, they experience recurrent minor flooding from the lake adjacent to the City (Huslia 2009).

"USACE, Floodplain Management Services, indicates that the flood hazard is low at the townsite (US ACE 1993). High water in the Koyukuk River occurs during spring break-up, but the location of the community on the sandy, silty bench is generally high enough to escape flooding. In the spring of 1989, high water topped the old lagoon and washed out its westerly side." (Huslia 1999)

Figure 5.6 shows the City of Huslia's flood threat source, the Mingoguit Lake with a community drawn high water inundation line.

Figure 5-6 Mingoguit Lake High Water Line

Extent

Floods are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related probability of occurrence.

The following factors contribute to riverine flooding frequency and severity:

- Rainfall intensity and duration
- Antecedent moisture conditions
- Watershed conditions, including terrain steepness, soil types, amount, vegetation type, and development density
- The attenuating feature existence in the watershed, including natural features such as swamps and lakes and human-built features such as dams
- The flood control feature existence, such as levees and flood control channels
- Flow velocity

- Availability of sediment for transport, and the bed and embankment watercourse erodibility
- Village or city location related to the typical flood elevation

The community has indicated that there are no areas that have been historically impacted by riverine floods. The City residential area located adjacent to the Mingoguit Lake where overflow water surround their houses without damage. An average of 2 ft of water flows along the streets reaching just below the top of house foundations located within .025 miles of the lake shore. No residential damages have been experienced and potential impacts are limited to slight roadbed erosion.

Impacts to future populations, residences, critical facilities, and infrastructure are anticipated at the same non-threatening level. Although the City of Huslia does not perceive their minor overflow flooding warrants NFIP participation; they are still considering NFIP benefits and future program participation.

Based on past flood events and the criteria identified in Table 5-3, the extent of lake overflow flood impacts in the City of Huslia are considered limited where injuries do not result in permanent disability, complete shutdown of critical facilities occurs for more than one week, and more than 10 percent of property is severely damaged.

Impact

Nationwide, floods result in more deaths than any other natural hazard. Physical damage from floods includes the following:

- Structure flood inundation, causing water damage to structural elements and contents
- Erosion or scouring of stream banks, roadway embankments, foundations, footings for bridge piers, and other features
- Damage to structures, roads, bridges, culverts, and other features from high-velocity flow and debris carried by floodwaters. Such debris may also accumulate on bridge piers and in culverts, increasing loads on these features or causing overtopping or backwater damages
- Sewage and hazardous or toxic materials release as wastewater treatment plants or sewage lagoons are inundated, storage tanks are damaged, and pipelines are severed

Floods also result in economic losses through business and government facility closure, communications, utility (such as water and sewer), and transportation services disruptions. Floods result in excessive expenditures for emergency response, and generally disrupt the normal function of a community.

Impacts and problems also related to flooding are deposition and stream bank erosion (erosion is discussed in detail in Section 5.3.3).

Deposition is the accumulation of soil, silt, and other particles on a river bottom or delta. Deposition leads to the destruction of fish habitat and presents a challenge for navigational purposes. Deposition also reduces channel capacity, resulting in increased flooding or bank erosion. Stream bank erosion involves the removal of material from the stream bank. When bank

erosion is excessive, it becomes a concern because it results in loss of streamside vegetation, loss of fish habitat, and loss of land and property (BKP 1988).

Probability of Future Events

Based on previous occurrences and applying the criteria identified in Table 5-2, it is likely a lake overflow flood event will occur in the next three years (event has up to 1 in 3 years chance of occurring) as the history of events is greater than 20 percent but less than or equal to 33 percent likely per year.

5.3.5 Permafrost

5.3.5.1 Nature

Permafrost is defined as soil, sand, gravel, or bedrock that has remained below 32°F for two or more years. Permafrost can exist as massive ice wedges and lenses in poorly drained soils or as relatively dry matrix in well-drained gravel or bedrock. During the summer, the surficial soil material thaws to a depth of a few feet, but the underlying frozen materials prevent drainage. The surficial material that is subject to annual freezing and thawing is referred to as the “active layer”.

Permafrost melting (or degradation) occurs naturally as a result of climate change, although this is usually a very gradual process. Thermokarst is the process by which characteristic land forms result from the melting of ice-rich permafrost. As a result of thermokarst, subsidence often creates depressions that fill with melt water, producing water bodies referred to as thermokarst lakes or thaw lakes.

Human induced ground warming can often degrade permafrost much faster than natural degradation caused by a warming climate. Permafrost degradation can be caused by constructing warm structures on the ground surface allowing heat transfer to the underlying ground. Under this scenario, improperly designed and constructed structures can settle as the ground subsides, resulting in loss of the structure or expensive repairs. Permafrost is also degraded by damaging the insulating vegetative ground cover, allowing the summer thaw to extend deeper into the soil causing subsidence of ice-rich permafrost, often leading to creation of thermokarst water bodies. Evidence of this type of degradation can be seen where thermokarst water bodies are abundant in the ruts of an old trail used by heavy equipment (cat trails) or where roads or railroads constructed by clearing and grubbing have settled unevenly.

5.3.5.2 History

There is no written record defining permafrost impacts. However, the Planning Team identified that periodic, uneven settling within the City has damaged buildings and roads constructed in permafrost areas.

5.3.5.3 Location, Extent, Impact, and Probability of Future Events

Location

According to mapping completed by the USGS and comments received from the City, the entire City of Huslia is underlain by discontinuous permafrost; Figure 5-4 defines where permafrost is most prevalent. "Frost level is estimated to penetrate 7.5 to 8 ft in the permafrost-free sand bench on which the village is located. A low-lying area just west of the village contains permafrost and has an active layer of 2 to 3 ft." (Huslia 1999)
Figure 5-7 depicts permafrost locations throughout Alaska.

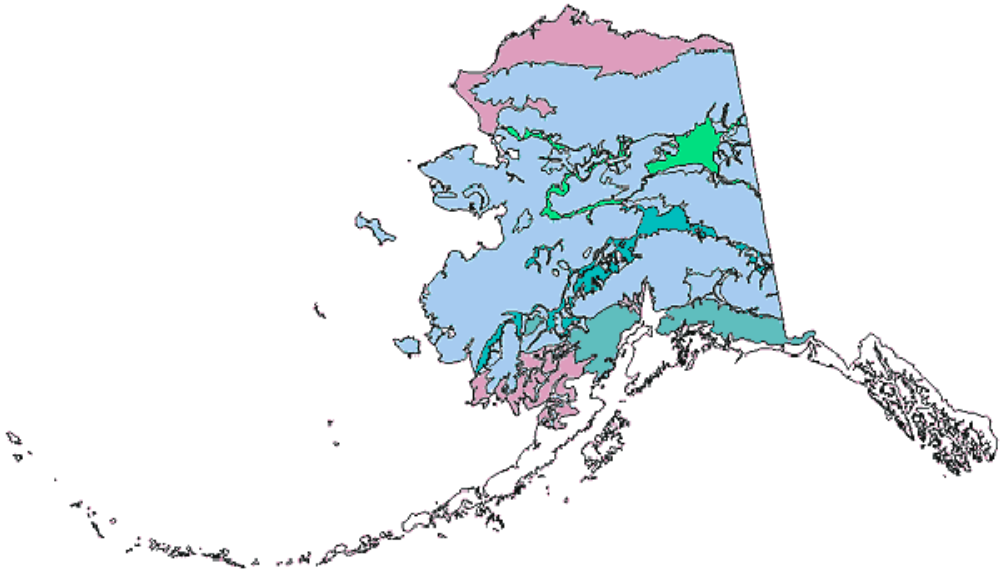

Figure 5-7 Permafrost Map of Alaska (Ferrians O 1998)

(City of Huslia Area located in area of discontinuous permafrost)

Extent

The damage magnitude could range from minor with some repairs required and little to no damage to transportation, infrastructure, or the economy to major if a critical facility (such as the airport) were damaged and transportation was effected.

Based on past permafrost degradation events and the criteria identified in Table 5-3, the extent of permafrost degradation impacts in the City of Huslia are considered negligible where injuries are treatable with first aid, minor quality of life is lost, shutdown of critical facilities and services occurs for 24 hours or less, and less than 10 percent of property is severely damaged.

Impact

Impacts associated with degrading permafrost include surface subsidence, infrastructure, structure, and/or road damage. Permafrost does not pose a sudden and catastrophic hazard but improperly designed and constructed structures can settle as the ground subsides, resulting in loss of the structure or expensive repairs. Permafrost restricts use of the ground surface, and affects the location and design of roads, buildings, communities, pipelines, airfields, and bridges. To avoid costly damage to these facilities, careful planning and design in the location and construction of facilities is warranted.

Probability of Future Events

The City of Huslia has no recorded historical permafrost damage. However, the Planning Team stated that permafrost damage does periodically occur to those structures and roads located adjacent to the lake as indicated in Figure 5-5. The Planning Team stated that the probability for permafrost occurring follows the criteria in Table 5-2, where the probability of future damage resulting from permafrost is possible in the next five years (event has up to 1 in 5 years chance of occurring) as the history of events is greater than 10 percent but less than or equal to 20 percent likely per year (Huslia 2009).

5.3.6 Weather (Severe)

5.3.6.1 Nature

Severe weather in Alaska includes thunderstorms, lightning, hail, heavy and drifting snow, freezing rain/ice storm, extreme cold, and high winds. The City of Huslia experiences the following.

Heavy and Drifting Snow

Heavy snow generally means snowfall accumulating to four inches or more in depth in 12 hours or less, or six inches or more in depth, in 24 hours or less. Drafting is the uneven distribution of snowfall and snow depth caused by strong surface winds. Drifting snow may occur during or after a snowfall.

Freezing Rain/Ice Storm

Freezing rain and ice storms occur when rain or drizzle freezes on surfaces, accumulating 12 inches in less than 24 hours.

Extreme Cold

The definition of extreme cold varies according to the normal climate of a region. In areas unaccustomed to winter weather, near freezing temperatures are considered “extreme”. In Alaska, extreme cold usually involves temperatures between -20 to -50°F. Excessive cold may accompany winter storms, be left in their wake, or can occur without storm activity. The City of Huslia’s coldest temperature occurred January 29-31, 1999 and measured -67ºF.

High Winds

High winds occur in Alaska when there are winter low-pressure systems in the North Pacific Ocean and the Gulf of Alaska. Alaska’s high wind can equal hurricane force but fall under a different classification because they are not cyclonic nor possess other characteristics of

hurricanes. In Alaska, high winds (winds in excess of 60 mph) occur rather frequently over the interior due to strong pressure differences, especially where influenced by mountainous terrain. The City of Huslia's highest wind speed reached 49.5 mph (NOAA 2006a).

5.3.6.2 History

Table 5-7 lists the National Weather Service's major storm events for the City of Huslia's Weather Zone. Each weather event may not have specifically impacted the City but they were listed due to the City's close proximity to listed communities or by location within the identified zone.

Table 5-7 Severe Weather Events

Zone(s)	Location(s)	Date(s)	Event	Description
AK004, AK008,	Various	24-25 Feb 89	Winter Storm	Wind and heavy snow in many areas, probably affected all villages. Huslia -61ºF.
AK004		17-26 Aug 94	Flood	Major flooding on the Koyukuk, Kobuk, and Noatak Rivers. Total restoration estimate of the flooded villages on the rivers is $74K.
AK004		24-26 Feb 96	High Wind	Strong high pressure produced strong winds in the passes of the Alaska and Brooks Ranges.
AK004	Huslia	26-31 May 98, 01 Jun 98	Flood	Rain and rapid snowmelt caused flooding on the Koyukuk River. Bank erosion occurred at Huslia, no structures were damaged.
AK004 AK008	Huslia	26-29 Feb 96	Heavy Snow	Snow to fall over the western two thirds of Northern Alaska. Snowfall totals for the one-to-two day event. Huslia 6-8"
AK004 AK008	Huslia	22-24 an 99	Heavy Snow	Precipitation and strong winds through passes of the Brooks and Alaska Ranges.
AK004 AK008	Huslia	29-31 Jan 99	Extreme Cold	50s below during the period and reached the 60s below one or more times. Huslia: -67ºF
AK004 AK008	Huslia	01-12 Feb 99	Extreme Cold	50s below during the period and reached the 60s below one or more times.
AK004 AK008	Koyukuk Valley	20-23 Dec 99	Heavy Snow	Cold front brought a variety of winter weather to interior Alaska, along with high winds.
AK004 AK008	Huslia	1-3 Feb 00	Blizzard	Wide variety of winter weather, strong south winds, and blizzard conditions. Blizzard conditions occurred at Huslia.
AK004 AK008	Bettles, Nulato, Galena, Kaltag	9-11 Nov 00	Winter Storm	Variety of Winter Weather along with strong south winds, cold air, and blizzard conditions.
AK216	Galena, Nulato, Kaltag	2-3 Apr 01	Heavy Snow	Blizzard conditions, heavy snow, high winds.
AK219	Upper Koyukuk Valley	5 Jan 02	High Wind	Wind gusts to 50 mph damages $3,500.
AK216 AK219	Huslia	30-31 Oct 03	Winter Storm	Rain and freezing rain was reported at Huslia and Kaltag.
AK216-AK219	Galena, Bettles	2-5 Jan 05	Heavy Snow	Snow lingered behind the cold front, Heavy Snow.
AK216	Huslia	20-25 May 05	Flood	Rains, snowmelt, and bank erosion at the village of Huslia, one home was threatened and several utility poles had to be moved. River water flowed into adjacent lake, causing

Table 5-7 Severe Weather Events

Zone(s)	Location(s)	Date(s)	Event	Description
				minor flooding to several residences along the lakeshore.
AK215 AK216	Huslia	3-5 Apr 08	Winter Storm	Rain and/or freezing rain, snowfall amounts of 7 to 9 inches. Snowfall estimated at 6.8 inches Huslia received more precipitation most likely in the form of freezing rain.
AK216 AK219	Lower Koyukuk Middle Yukon Valleys	9 Dec 08	High Wind	Strong winds of 50 mph with local gusts to 70 mph.
AK216 AK219	Galena, Bettles	1-12 Jan 09	Extreme Cold/Wind Chill	Cold snap. Most prolonged cold snap across interior Alaska since 1999.
AK215, AK216 AK219	Huslia	13-16 Jan 09	Winter Storm	Approx. 8 to 12 inches of snow along eastern slopes of the Nulato Kills. Likely that the snow changed to freezing rain in Huslia.

(Lingaas, 2009)

5.3.6.3 Location, Extent, Impact, and Probability of Future Events

Location

The National Weather Service has continued to modify their system for assigning weather zones to facilitate and more accurately confine weather patterns to relevant geographic areas. Consequently the data in Table 5-7 reflects different zone numbering patterns and should be used to depict weather events that have historically impacted the area; some of which may not have impacted the City of Huslia as severely as other areas within the same zone.

Extent

The entire City of Huslia area is equally vulnerable to the effects of severe weather. Winter snows average 5-6 inches per storm, wind speed varies based on weather patterns but reach as high as 49 mph, while record lows have reached -61ºF.

Based on past severe weather events and the criteria identified in Table 5-3, the extent of severe weather in the City of Huslia are considered limited where injuries do not result in permanent disability, complete shutdown of critical facilities occurs for more than one week, and more than 10 percent of property is severely damaged.

Impact

The intensity, location, and the land's topography influence the impact of severe weather conditions on a community.

Heavy snow can immobilize a community by bringing transportation to a halt. Until the snow can be removed, airports and roadways are impacted, even closed completely, stopping the flow of supplies and disrupting emergency and medical services. Accumulations of snow can cause roofs to collapse and knock down trees and power lines. Heavy snow can also damage light aircraft and sink small boats. A quick thaw after a heavy snow can cause substantial flooding.

The cost of snow removal, repairing damages, and the loss of business can have severe economic impacts on cities and towns.

Injuries and deaths related to heavy snow usually occur as a result of vehicle and or snow machine accidents. Casualties also occur due to overexertion while shoveling snow and hypothermia caused by overexposure to the cold weather.

Extreme cold can also bring transportation to a halt. Aircraft may be grounded due to extreme cold and ice fog conditions, cutting off access as well as the flow of supplies to communities. Long cold spells can cause rivers to freeze, disrupting shipping and increasing the likelihood of ice jams and associated flooding.

Extreme cold also interferes with the proper functioning of a community's infrastructure by causing fuel to congeal in storage tanks and supply lines, stopping electric generation. Without electricity, heaters and furnaces do not work, causing water and sewer pipes to freeze or rupture. If extreme cold conditions are combined with low or no snow cover, the ground's frost depth can increase, disturbing buried pipes. The greatest danger from extreme cold is its effect on people. Prolonged exposure to the cold can cause frostbite or hypothermia and become life-threatening. Infants and elderly people are most susceptible. The risk of hypothermia due to exposure greatly increases during episodes of extreme cold, and carbon monoxide poisoning is possible as people use supplemental heating devices (NOAA 2001).

Heavy rain creates flooding and damages roads and infrastructure while no rain reduces subsistence capability by preventing crop growth, wildlife availability and water access. Severe weather events can directly determine the City’s survivability.

Probability of Future Events

Based on previous occurrences and the criteria identified in Table 5-2, it is likely a severe storm event will occur in the next three years (event has up to 1 in 3 years chance of occurring) as the history of events is greater than 20 percent but less than or equal to 33 percent likely per year.

5.3.7 Wildland Fire

5.3.7.1 Nature

A wildland fire is a type of wildfire that spreads through consumption of vegetation. It often begins unnoticed, spreads quickly, and is usually signaled by dense smoke that may be visible from miles around. Wildland fires can be caused by human activities (such as arson or campfires) or by natural events such as lightning. Wildland fires often occur in forests or other areas with ample vegetation. In addition to wildland fires, wildfires can be classified as urban fires, interface or intermix fires, and prescribed fires.

The following three factors contribute significantly to wildland fire behavior and can be used to identify wildland fire hazard areas.

- **Topography:** As slope increases, the rate of wildland fire spread increases. South-facing slopes are also subject to more solar radiation, making them drier and thereby intensifying wildland fire behavior. However, ridge tops may mark the end of wildland fire spread, since fire spreads more slowly or may even be unable to spread downhill.

- **Fuel:** The type and condition of vegetation plays a significant role in the occurrence and spread of wildland fires. Certain types of plants are more susceptible to burning or will burn with greater intensity. Dense or overgrown vegetation increases the amount of combustible material available to fuel the fire (referred to as the "fuel load"). The ratio of living to dead plant matter is also important. The risk of fire is increased significantly during periods of prolonged drought as the moisture content of both living and dead plant matter decreases. The fuel load continuity, both horizontally and vertically, is also an important factor.
- **Weather:** The most variable factor affecting wildland fire behavior is weather. Temperature, humidity, wind, and lightning can affect chances for ignition and spread of fire. Extreme weather, such as high temperatures and low humidity, can lead to extreme wildland fire activity. By contrast, cooling and higher humidity often signal reduced wildland fire occurrence and easier containment.

The frequency and severity of wildland fires is also dependent on other hazards, such as lightning, drought, and infestations (such as the damage caused by spruce-bark beetle infestations). If not promptly controlled, wildland fires may grow into an emergency or disaster. Even small fires can threaten lives and resources and destroy improved properties. In addition to affecting people, wildland fires may severely affect livestock and pets. Such events may require emergency water/food, evacuation, and shelter.

The indirect effects of wildland fires can be catastrophic. In addition to stripping the land of vegetation and destroying forest resources, large, intense fires can harm the soil, waterways, and the land itself. Soil exposed to intense heat may lose its capability to absorb moisture and support life. Exposed soils erode quickly and enhance rivers and stream siltation, thereby enhancing flood potential, harming aquatic life, and degrading water quality. Lands stripped of vegetation are also subject to increased debris flow hazards.

5.3.7.2 History

Wildland fires have not been documented within the boundaries of City of Huslia; however, wildland fires have occurred in the vicinity.

Over 248 wildland fire events occurred within 50 miles of the City of Huslia. Sixty-one of these fire events exceeded 5,000 acres (Table 5-8) during the historical period of 69 years (1939 to 2008).

Table 5-8 Wildfire Locations Since 1939 within 50 Miles of the City of Huslia

Fire Name	Fire Year	Estimated Acres	Specific Cause
Coffee Can Lake	2007	39795	Lightning
Three Days Of Restoration	2006	9610	Other
Babantaltlin Hills	2005	18780.5	Lightning
Six Mile	2005	25918.6	Lightning
Bakatigikh Mountain	2005	11736.5	Lightning
Louis Lake	2004	22193	Lightning
Holtnaka	2002	23033	Undetermined
Natlaratlen River	2000	8541	Lightning

Table 5-8 Wildfire Locations Since 1939 within 50 Miles of the City of Huslia

Fire Name	Fire Year	Estimated Acres	Specific Cause
Roundabout Mountain	1999	5763	Lightning
Big Creek	1999	28634	Lightning
532370	1995	6060	Lightning
432225	1994	14000	Lightning
Dck Sw 50	1994	12000	Lightning
Hsl Nnw 37	1991	13420	Lightning
Gal Ne 30	1991	11040	Lightning
Hsl N 48	1991	6080	Lightning
Btt Wsw 84	1991	184520	Lightning
Hsl W 37	1990	6800	Lightning
Gal N 38	1990	60000	Lightning
031044	1990	25000	Lightning
032038	1990	165290.3	Lightning
832061	1988	8080	Lightning
831023	1988	141546	Lightning
832083	1988	16700	Lightning
Gal Ne 87	1986	6200	Lightning
Dck Sw 47	1986	13300	Lightning
Tal Nw 85	1985	23500	Lightning
Hus Nw 23	1985	9500	Lightning
Gal Ne 57	1985	37000	Lightning
Crow Lake	1977	91000	Lightning
Triplet	1977	76800	Lightning
Buza	1974	512000	Lightning
Bear	1973	18500	Lightning
Sand Dunes	1972	60000	Lightning
Pah River	1972	120000	Lightning
Tobys Cabin	1972	82000	Lightning
Bear Mt	1971	95000	Lightning
Pimingo	1971	13000	Lightning
Cottonwood	1969	140000	Lightning
Dulbi	1969	12000	Lightning
Base Line	1968	8000	Lightning
Sheets Creek	1968	7000	Lightning
Melozi Springs	1968	16000	Lightning
Nulitna River	1968	13000	Lightning
Holt Creek	1968	8000	Lightning
Cottonwood	1968	6000	Lightning
Dunes	1966	30000	Lightning
Bear Mt	1966	58000	Lightning
Sands Ne-15	1959	38000	Lightning
Kokrines Nw-19	1959	6400	Lightning
Huggins Island W-10	1959	50000	Lightning
Kateel River #5	1957	1161200	Lightning

Table 5-8 Wildfire Locations Since 1939 within 50 Miles of the City of Huslia

Fire Name	Fire Year	Estimated Acres	Specific Cause
Purcell Mt Sw 30	1956	7600	Lightning
Huslia River #2	1956	140580	Lightning
Galena N-35	1956	23000	Lightning
Dubli #2	1956	112492	Lightning
Purcell Mountain	1954	84480	Lightning
20 Mile	1954	17920	Lightning
Galena	1946	15360	Lightning
Batza	1946	14080	Lightning
Hog River	1943	10000	Unknown

(DOF 2009)

5.3.7.3 Location, Extent, Impact, and Probability of Future Events

Location

Under certain conditions wildland fires may occur in any area with fuel surrounding the City of Huslia. Since fuels data is not readily available, for the purposes of this plan, all areas outside City limits are considered to be vulnerable to wildland fire impacts. Since 1939, 248 wildland fire events have occurred within 50 miles of the City of Huslia with over 61 of them exceeding 5,000 acres (Figure 5-8).

Extent

Generally, fire vulnerability dramatically increases in the late summer and early fall as vegetation dries out, decreasing plant moisture content and increasing the ratio of dead fuel to living fuel. However, various other factors, including humidity, wind speed and direction, fuel load and fuel type, and topography can contribute to the intensity and spread of wildland fires. The common causes of wildland fires in Alaska include lightening strikes and human negligence.

Fuel, weather, and topography influence wildland fire behavior. Fuel determines how much energy the fire releases, how quickly the fire spreads, and how much effort is needed to contain the fire. Weather is the most variable factor. High temperatures and low humidity encourage fire activity while low temperatures and high humidity retard fire spread. Wind affects the speed and direction of fire spread. Topography directs the movement of air, which also affects fire behavior. When the terrain funnels air, as happens in a canyon, it can lead to faster spreading. Fire also spreads up slope faster than down slope.

The 61 largest wildland fire events that occurred within 50 miles of the City of Huslia burned an average of 65,597 acres per event. However, none of these fires directly affected the City of Huslia.

Based on the criteria identified in Table 5-3, the magnitude and severity of impacts in the City of Huslia are considered negligible with minor injuries, the potential for critical facilities to be shutdown for less than 24 hours, less than 10 percent of property or critical infrastructure being severely damaged, and little to no permanent damage to transportation or infrastructure or the economy.

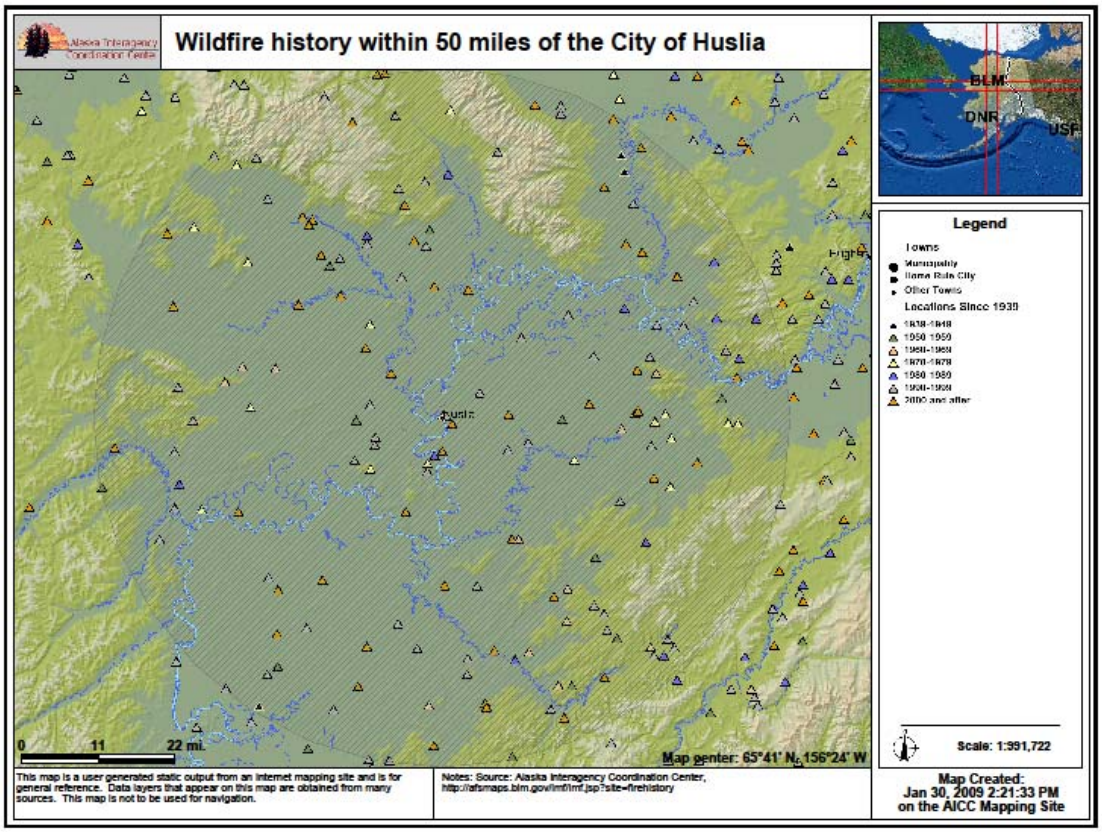

Figure 5-8 **Huslia Area Wildfire History** (DOF, 2009)

Impact

Impacts of a wildland fire that interfaces with the population center of City of Huslia could grow into an emergency or disaster if not properly controlled. A small fire can threaten lives and resources and destroy property. In addition to impacting people, wildland fires may severely impact livestock and pets. Such events may require emergency watering and feeding, evacuation, and alternative shelter.

Indirect impacts of wildland fires can be catastrophic. In addition to stripping the land of vegetation and destroying forest resources, large, intense fires can harm the soil, waterways, and the land itself. Soil exposed to intense heat may lose its capability to absorb moisture and support life. Exposed soils erode quickly and enhance siltation of rivers and streams, thus increasing flood potential, harming aquatic life, and degrading water quality.

Probability of Future Events

Fire is recognized as a critical feature of the natural history of many ecosystems. It is essential to maintain the biodiversity and long-term ecological health of the land. The role of wildland fire as an essential ecological process and natural change agent has been incorporated into the fire management planning process and the full range of fire management activities is exercised in Alaska to help achieve ecosystem sustainability, including its interrelated ecological, economic, and social consequences on firefighter and public safety and welfare, natural and cultural

resources threatened, and the other values to be protected dictate the appropriate management response to the fire. In Alaska, the natural fire regime is characterized by a return interval of 50 to 200 years, depending on the vegetation type, topography, and location. Recorded wildland fires occurring within 50 miles of City of Huslia have an average recurrence rate of approximately 2.5 to 3 years.

Based on the history of wildland fires in the City of Huslia area and applying the criteria identified in Table 5-2, it is highly likely a wildland fire event will occur within 50 miles of the City in the next year. The event has up to 1 in 1 years chance of occurring and the history of events is greater than 33 percent likely each year.

However, based on historical wildland fire impacts within the 50 mile radius of the City of Huslia area and applying the criteria identified in Table 5-2, it is likely a wildland fire event will occur in the next three years. The event has up to 1 in 3 years chance of occurring and the history of events is greater than 10 percent but less than or equal to 20 percent likely each year.

This section provides an overview of the vulnerability analysis and describes the five specific steps: asset inventory, methodology, data limitations, and exposure analysis for current assets, and areas of future development.

6.1 OVERVIEW OF A VULNERABILITY ANALYSIS

A vulnerability analysis predicts the extent of exposure that may result from a hazard event of a given intensity in a given area. The analysis provides quantitative data that may be used to identify and prioritize potential mitigation measures by allowing communities to focus attention on areas with the greatest risk of damage. A vulnerability analysis is divided into five steps: including asset inventory, methodology, data limitations, exposure analysis for current assets, and areas of future development.

The requirements for a vulnerability analysis as stipulated in DMA 2000 and its implementing regulations are described here.

- A summary of the community's vulnerability to each hazard that addresses the impact of each hazard on the community.

DMA 2000 Requirements: Risk Assessment, Assessing Vulnerability, Overview

Assessing Vulnerability: Overview

Requirement §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description **shall** include an overall summary of each hazard and its impact on the community.

Element

- Does the new or updated plan include an overall summary description of the jurisdiction's vulnerability to each hazard?
- Does new or updated the plan address the impact of each hazard on the jurisdiction?

Source: FEMA, July 2008.

- Identification of the types and numbers of RL properties in the identified hazard areas.

DMA 2000 Requirements: Risk Assessment, Assessing Vulnerability, Addressing Repetitive Loss Properties

Assessing Vulnerability: Addressing Repetitive Loss Properties

Requirement §201.6(c)(2)(ii): [The risk assessment] **must** also address National Flood Insurance Program (NFIP) Insured structures that have been repetitively damaged floods.

Element

- Does the new or updated plan describe vulnerability in terms of the types and numbers of repetitive loss properties in the identified hazard areas?

Source: FEMA, July 2008.

- An identification of the types and numbers of existing vulnerable buildings, infrastructure, and critical facilities and, *if possible*, the types and numbers of vulnerable future development.

DMA 2000 Recommendations: Risk Assessment, Assessing Vulnerability, Identifying Structures

Assessing Vulnerability: Identifying Structures

Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.

Element

- Does the new or updated plan describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas?
- Does the new or updated plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?

Source: FEMA, July 2008.

- Estimate of potential dollar losses to vulnerable structures and the methodology used to prepare the estimate.

DMA 2000 Recommendations: Risk Assessment, Assessing Vulnerability, Estimating Potential Losses

Assessing Vulnerability: Estimating Potential Losses

Requirement §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate.

Element

- Does the new or updated plan estimate potential dollar losses to vulnerable structures?
- Does the new or updated plan describe the methodology used to prepare the estimate?

Source: FEMA, July 2008.

6.2 VULNERABILITY ANALYSIS: SPECIFIC STEPS

6.2.1 Asset Inventory

Asset inventory is the first step of a vulnerability analysis. Assets that may be affected by hazard events include population (for community-wide hazards), residential buildings (where data is available), and critical facilities and infrastructure. The assets and associated values throughout the City of Huslia are identified and discussed in detail in the following sections.

6.2.1.1 Population and Building Stock

Population data for the City of Huslia were obtained from the 2000 U.S. Census. The City of Huslia's total population for 2000 was 293 with a 2008 DCCED/DCRA certified population of 277 (Table 6-1).

Table 6-1 Estimated Population and Building Inventory

Population		Residential Buildings	
2000 Census	DCCED/DCRA 2008 Data	Total Building Count	Total Value of Buildings[1]
293	277	111	$8,746,800

Sources: City of Huslia, U.S. Census 2000, and the DCCED/DCRA 2008Certified population.
[1] Average structural value of all single-family residential buildings is $78,800 per structure.

Estimated numbers of residential buildings and replacement values for those structures, as shown in Table 6-1, were obtained from the City of Huslia, the 2000 U.S. Census, and DCCED/DCRA. A total of 111 single-family residential buildings were considered in this analysis.

6.2.1.2 Repetitive Loss Properties

The City of Huslia is located above the normal floodplain where the Planning Team does not feel any residential structures are at risk of this hazard; therefore the City does not currently participate in the NFIP. The City does not have a RL Property Inventory that meets the RL or SRL criteria. The community has a slight impact from lake overflow flooding but this is not a severe threat to the City's infrastructure.

6.2.1.3 Existing Critical Facilities and Infrastructure

A critical facility is defined as a facility that provides essential products and services to the general public, such as preserving the quality of life in the City of Huslia and fulfilling important public safety, emergency response, and disaster recovery functions. The critical facilities profiled in this plan include the following:

- Government facilities, such as city and tribal administrative offices, departments, or agencies
- Emergency response facilities, including police, Village Public Safety Officer (VPSO), fire, and Code Red equipment
- Educational facilities, including K-12
- Care facilities, such as medical clinics, congregate living health, residential and continuing care, and retirement facilities
- Community gathering places, such as community and youth centers
- Utilities, such as electric generation, communications, water and waste water treatment, sewage lagoons, landfills

The total number of critical facilities is listed in Table 6-2.

Table 6-2 City of Huslia Critical Facilities

Occupancy Type	Facility Name	Location / Address	Structure Value or Per Mile Replacement Value	Total Mile, Gallons, or Occupants
Government Facility	Huslia City Hall	58 Dakli Street	$511,135	2 Occ.
	US Post Office	34 Dakli Street	$300,000	1 Occ.
Transportation Facilities	Huslia Airport	Airport Road	$12,204,181	0 Occ.
Emergency Response	Fire Station	58 Dakli Street	$66,025	0 Occ.

Table 6-2 City of Huslia Critical Facilities

Occupancy Type	Facility Name	Location/Address	Structure Value or Per Mile Replacement Value	Total Mile, Gallons, or Occupants
Facility		65.69861N -156.39972W		
	VPSO Office at City Hall	See City Office	$0	
Educational Facility	Jimmy Huntington School (K-12)	41 Jimmy Huntington Road	$1,044,848	102 Occ.
	Head Start	31 Jimmy Huntington Road	$387,228	20 Occ.
Care Facility	Huslia Health Clinic	166 Old Spring Camp Road	$1,838,132	4 Occ.
Community Facility	Church – Catholic	1 Hilltop Street	$700,000	1 Occ.
	Church- Good Shepherd	67 Moonlight Drive	$700,000	0 Occ.
	Equipment Storage Shed	Dakli Street	$110,000	0 Occ.
	Senior Center - Elders Building	60 Dakli Street	$287,007	4 Occ.
	Community Hall	57 Dakli Street	$300,000	0 Occ.
	RJ's Hardware & Gen Store	Moonlight Drive	$200,000	1 Occ.
	R&M Mercantile Co	92 Moonlight Drive	$400,000	1 Occ.
	Teacher Housing	12 Dalbi Street	$929,940	14 Occ.
Roads	Roads (BIA) @ $10,000/mile		$1,300,000	130 miles
	Roads (City) @ $10,000/mile		$188,000	18.8 miles
	Landfill Access Road		$360,000	1 mile
	Airport Access Road		$199,864	0 Occ.
Bridges	None			
Utilities	City/Huslia Gas & Oil Fuel Storage Facility	110 Airport Road	$1,114,335	60,559 gal I Occ.

Table 6-2 City of Huslia Critical Facilities

Occupancy Type	Facility Name	Location/Address	Structure Value or Per Mile Replacement Value	Total Mile, Gallons, or Occupants
	AVEC Fuel Storage Tanks	110 Airport Road	$1,200,000	67,174 gal 2 Occ.
	Yukon-Koyukuk Schools Fuel Storage Tanks	41 Jimmy Huntington Road	$800,000	39,874 gal
	Distribution Line to Barge Landing (Fuel)		$229,935	0 Occ.
	Distribution Line to Barge Landing (Gas)		$250,000	0 Occ.
	Water Treatment Plant/Washeteria	181 Spring Camp Road	$2,740,000	2 Occ.
	Huslia Public Water Supply	181 Spring Camp Road	$2,200,000	0 Occ.
	AVEC Power Generation	New Airport Road	$74,000	2 Occ.
	Satellite Dish - ARCS	58 Dakli Street, 65.69861N, -156.39972W	$120,000	0 Occ.
	Telephone-ACS (underground)	Community Wide	$300,000	0 Occ.
	Utility Poles	Community Wide	$180,000	0 Occ.
	Landfill, Class 3	Airport Road	$876,000	0 Occ.
	Sewage Lagoon		$500,000	0 Occ.
	Piped Sewer System	Community Wide	$3,600,000	0 Occ.
	Piped Water System	Community Wide	$1,681,700	0 Occ.
	Power Distribution System	Community Wide	$260,556	0 Occ.
	Community Well	Old Airport Road	$350,000	0 Occ.

6.2.1.4 Future Critical Facilities and Infrastructure

Immediate plans for future development in the City of Huslia includes housing construction in the new residential subdivision with power distribution, new teacher housing, renovation of 30 single family Interior Rural Housing Authority (IRHA) housing units, new landfill access road,

major airport improvements, new piped water distribution lines, and relocating above ground power poles away from erosion threatened area.

6.2.2 Methodology

A conservative exposure-level analysis was conducted to assess the risks of the identified hazards. This analysis is a simplified assessment of the potential effects of the hazards on values at risk without consideration of probability or level of damage.

Critical facilities were identified by the Planning Team and were compared to locations where hazards are likely to occur. If any portion of the critical facility fell within a hazard area, it was counted as being exposed and vulnerable to the particular hazard.

Replacement structure and contents values were developed for physical assets. These values were obtained from the State of Alaska Critical Facilities Database, the capital projects database, Huslia, Alaska, or provided by the City of Huslia. For each physical asset located within a hazard area, exposure was calculated by assuming the worst-case scenario (that is, the asset would be completely destroyed and would have to be replaced). Finally, the aggregate exposure, in terms of replacement value or insurance coverage, for each category of structure or facility was calculated. A similar analysis was used to evaluate the proportion of the population at risk. However, the analysis simply represents the number of people at risk; no estimate of the number of potential injuries or deaths was prepared.

6.2.3 Data Limitations

The vulnerability estimates provided herein use the best data currently available, and the methodologies applied result in an approximation of risk. These estimates may be used to understand relative risk from hazards and potential losses. However, uncertainties are inherent in any loss estimation methodology, arising in part from incomplete scientific knowledge concerning hazards and their effects on the built environment as well as the use of approximations and simplifications that are necessary for a comprehensive analysis.

It is also important to note that the quantitative vulnerability assessment results are limited to the exposure of people, buildings, and critical facilities and infrastructure to the identified hazards. It was beyond the scope of this HMP to develop a more detailed or comprehensive assessment of risk (including annualized losses, people injured or killed, shelter requirements, loss of facility/system function, and economic losses). Such impacts may be addressed with future updates of the HMP.

6.2.4 Exposure Analysis

The results of the exposure analysis for loss estimations in the City of Huslia are summarized in Table 6-3 and in the following discussion.

Table 6-3 City of Huslia Potential Hazard Exposure Analysis

			Residential Structures		Critical Facilities		Total	
Hazard	Methodology	Population [a)]	Number	Value[(b)]	Number	Value[(b)]	Structures	Value[(b)]
Drought	Descriptive	277	0	$0	0	$0	$0	$0
Earthquake*	Simplified exposure-level analysis	277	111	$8,746,800	37	$38,527,886	148	$47,274,686
Erosion	Simplified exposure-level analysis	8	3	$236,400	7	$6,335,256	10	$651,656
Flood	Descriptive	63	20	$1,576,000	1.5 road miles	$15,000	0	$1,591,000
Permafrost*	Simplified exposure-level analysis	277	111	$8,746,800	37	$38,527,886	148	$47,274,686
Weather (Severe)*	Simplified exposure-level analysis	277	111	$8,746,800	37	$38,527,886	148	$47,274,686
Wildland Fire*	Simplified exposure-level analysis	277	111	$8,746,800	37	$38,527,886	148	$47,274,686

* *All people, critical facilities, and residential structures are equally vulnerable to this hazard.*
N/A = not available.
(a) total population was based on DCRA 2008 population data - population estimates were provided by the Planning Team for the Erosion and Flood Hazard areas.
(b) cost estimates based on Planning Team input.

Drought

Area-wide droughts have historically occurred in Alaska, and as it is a region-wide phenomenon, all residents within the City of Huslia are equally at risk. Structural damage from drought is not expected; rather the risks are present to humans and resources such as wildland or "natural" agriculture, fishing, timber, and wildlife have historically been impacted, as well as local and regional economies. The entire City's population of 277 is impacted by drought conditions.

Earthquake

Based on earthquake probability model maps produced by the USGS, the entire City of Huslia area is at risk of experiencing the impacts from an earthquake. However, the probability is low (see Section 5.3.2.3). Impacts to the community such as significant ground movement that may result in infrastructure damage are not expected. The entire existing and future City of Huslia population, residences, and critical facilities are exposed to the effects of an earthquake. This includes 277 people in 111 residences (worth approximately $8,746,800) and 37 critical facilities (worth $38,527,886).

Impacts to the community such as significant ground movement that may result in infrastructure damage are not expected. Minor shaking may be seen or felt based on past events. Although all structures are exposed to earthquakes, buildings within City of Huslia constructed with wood have slightly less vulnerability to the effects of earthquakes than those with masonry.

Impacts to future populations, residences, critical facilities, and infrastructure are anticipated at the same low impact level as the City of Huslia is not located in an area with a high probability of strong shaking (i.e., >M4.8).

Erosion

Based on local knowledge, areas within the City of Huslia affected by erosion are located along the Koyukuk River embankment. There are approximately six critical facilities (worth $5,935,256), one commercial building (worth $400,000) located in areas exposed and historically prone to erosion. There are eight people in three residential buildings, outbuildings, and sheds (worth approximately $236,400) located in areas exposed and historically prone to erosion.

Impacts from erosion include loss of land and any development on that land. Erosion can cause increased sedimentation of harbors and river deltas and hinder channel navigation, reduction in water quality due to high sediment loads, loss of native aquatic habitats, damage to public utilities (docks, harbors, electric and water/wastewater utilities), and economic impacts associated with costs trying to prevent or control erosion sites. In the City of Huslia, only the location of a building can lessen its vulnerability to erosion.

Impacts to future populations, residences, critical facilities, and infrastructure are anticipated at the same impact level until the City institutes land use controls prohibiting new construction in erosion prone areas. Impacts could also be lessened if affected properties could be relocated.

Flood

The community has indicated that there are no areas that have been historically impacted by riverine floods. The City residential area located adjacent to the Mingoguit Lake has had lake overflow water surround their houses without damage.

The Community has indicated they experience minor flooding from Mingoguit Lake from snowmelt overflow. No residential damages have been experienced and potential impacts are limited to slight roadbed erosion and to buildings on slab foundations, not located on raised foundations, and/or not constructed with materials designed to withstand flooding events (e.g., cross vents to allow water to pass through an open area under the main floor of a building). These buildings are more vulnerable to the impacts of flooding if the water was sufficiently high.

Impacts to future populations, residences, critical facilities, and infrastructure are anticipated at the same non-threatening level. The City's 1.5 miles of road surface (worth approximately $15,000) and approximately 20 residential buildings (worth approximately $1,576,000) can expect minor lake overflow impacts.

Although the City of Huslia does not perceive their minor overflow flooding warrants NFIP participation; they are still considering NFIP benefits and future participation.

Permafrost

According to mapping completed by the USGS and information supplied by the City, the entire City of Huslia is underlain by discontinuous permafrost, thus exposed to the impacts from this hazard. This includes 277 people in 111 residences (worth approximately $8,746,800) and all 37 critical facilities (worth approximately $38,527,886).

Impacts associated with degrading permafrost include surface subsidence, infrastructure, structure, and/or road damage. Buildings that are built on slab foundations and/or not constructed with materials designed to accommodate the movement associated with building on permafrost land are more vulnerable to the impacts of permafrost.

Impacts to future populations, residences, critical facilities, and infrastructure are anticipated at the same impact level. To lessen future impacts the City could institute and enforce land use controls prohibiting new construction in permafrost zones and building codes to accommodate the effects of permafrost on structures.

Weather, Severe

Using information provided by the City of Huslia and the National Weather Service, the entire existing and future City of Huslia population, residences, and critical facilities are equally exposed to the effects of a severe weather event. This includes 277 people in 111 residences (worth approximately $8,746,800) and all 37 critical facilities (worth approximately $38,527,886).

Impacts associated with severe weather events includes roof collapse, trees and power lines falling, damage to light aircraft and sinking small boats, injury and death resulting from snow machine or vehicle accidents, overexertion while shoveling all due to heavy snow. A quick thaw after a heavy snow can also cause substantial flooding. Impacts from extreme cold include hypothermia, halting transportation from fog and ice, congealed fuel, frozen pipes, disruption in

utilities, frozen pipes, and carbon monoxide poisoning. Section 5.3.6.3 provides additional detail regarding severe weather impacts. Buildings that are older and/or not constructed with materials designed to withstand heavy snow and wind (e.g., hurricane ties on crossbeams) are more vulnerable to the impacts of severe weather.

Impacts to future populations, residences, critical facilities, and infrastructure are anticipated at the same impact level. To lessen future impacts the City could institute and enforce building codes to accommodate the effects of severe weather on structures.

Wildland Fire

According to the Alaska Fire Service, there are no wildland fire areas within the City of Huslia boundaries. However, 248 wildland fires have occurred since 1939 within a 50-mile radius of the City. There is potential for wildland fire to interface with the population center of the City. Thus, for the purposes of this exposure and vulnerability assessment, it is assumed that all structures within the City are equally exposed to the impacts of a wildland fire event. This includes 277 people in 111 residences (worth approximately $8,746,800) and all 37 critical facilities (worth approximately $38,527,886).

Impacts associated with a wildland fire event include the potential for loss of life and property. It can also impact livestock and pets and destroy forest resources and contaminate water supplies. Buildings closer to the outer edge of town, those with a lot of vegetation surrounding the structure, and those constructed with wood are some of the buildings that are more vulnerable to the impacts of wildland fire.

Impacts to future populations, residences, critical facilities, and infrastructure are anticipated at the same impact level. Community education, building materials, and prepared response personnel are some things that could lessen future impacts.

DMA 2000 Recommendations: Risk Assessment, Assessing Vulnerability, Analyzing Development Trends

Assessing Vulnerability: Analyzing Development Trends

Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

Element

- Does the new or updated plan describe land uses and development trends?

Source: FEMA, July 2008.

6.3 LAND USE AND DEVELOPMENT TRENDS

The annual population growth has held at an average of two percent from 1950 through 2000 but has decreased slightly between 2000 and 2007. Land ownership in the City of Huslia includes Doyon, Ltd.; the K'oyiti'ots'ina Limited, Village Corporation; the State of Alaska; and private land owners, land designated as open space, and other sections that contain various hydrological bodies. One area of town is classified as airport land use and the Koyukuk Wildlife Refuge surrounds the community.

Land use in the City of Huslia is predominately residential with few areas for commercial services and community (or institutional) facilities.

The City of Huslia has no formal zoning or other land use controls. There are areas of commercial land uses within the City of Huslia that include facilities such as RJ's Hardware & General Store, R&M Mercantile Company, and a bakery.

Community facilities are classified under institutional land uses such as schools and government facilities.

Development Trends

Development trends in the City of Huslia will likely remain relatively flat keeping pace with low-to-slowly decreasing population growth.

Funds have been provided to connect 25 new Housing and Urban Development (HUD) homes and 11 others to the piped water and sewer system, including indoor plumbing. Funds have been requested to replace the water storage tank, water treatment building, washeteria, and landfill.

The following projects are in various stages from planning to construction:

Table 6-4 Projects Under Development

Lead Agency	Fiscal Year	Project Status	Project Description
ANTHC	2008	Funded	Alaska Native Tribal Health Consortium (ANTHC) Complete Washeteria/Water Treatment Plant, Purchase a Vacuum Pumper Truck, Build Garage
DCCED	2008	Funded	Tribal Council Multipurpose Building Phase I - Legislative Grant
DOT/PF	2008	Funded	Dept of Transportation & Public Facilities (DOT/PF) Airport Improvements - Legislative Grant
ANTHC	2007	Funded	Individual Water & Sewer
HUD	2007	Funded	Indian Housing Block Grant – Native American Housing Assistance and Self Determination Act (NAHASDA) administration, operation, and construction funds
DOT/PF	2007	Funded	Landfill Road - Upgrade the one mile road to the proposed landfill site
HUD	2006	Funded	Indian Housing Block Grant - NAHASDA administration, operation, and construction funds
ANTHC	2006	Funded	Upgrade and repair lift station
AHFC	2006	Funded	2 Single Family units rehab - Supplemental Housing Program
DEED	2006	Funded	Dept of Education and Early Development (DEED) Huslia Elementary Renovation
HUD	2005	Funded	Indian Housing Block Grant - NAHASDA administration, operation, and construction funds
FAA	2005	Funded	Acquire Snow Removal Equipment - Other Share - DOT/PF
ANTHC	2005	Funded	Water Main Replacement

(DCRA 2009)

Piped water and sewer has existed in Huslia since 1974. Water is derived from a well and is treated. A new airstrip site was constructed during the summer of 2000. Table 6-5 lists completed projects for the City of Huslia.

Table 6-5 Completed Projects

Lead Agency	Fiscal Year	Project Status	Project Description
Denali/AHFC	2006	Funded	Denali Commission, Alaska Housing Finance Corporation (AHFC) Teacher Housing Construction - Other Funding = AHFC Teacher

Table 6-5 Completed Projects

Lead Agency	Fiscal Year	Project Status	Project Description
			Health Prof & Pub Safety Grant: $259,397; Loan Financing: $189,393. New construction of duplex and single family unit - 2,832 sq ft total. Yukon Koyukuk School District.
ANTHC	2004	Funded	Health Clinic - Construct a new health clinic.
HUD	2004	Funded	Indian Housing Block Grant - NAHASDA administration, operation, and construction funds
ANTHC/Denali	2003	Funded	Huslia Washeteria Renovation - Denali Commission Funding. Repair and renovation of Washeteria/Water Treatment Plant
DOT&PF	2003	Funded	Airport Snow Removal Equip Bldg Upgrade/Snow Fence
DCCED/CDBG	2003	Funded	Primary Health Care Facility - CDBG
USDA/RD	2003	Funded	US Dept of Agriculture, Rural Development (USDA/RD) Fire Response Equipment & Training
HUD	2003	Funded	Indian Housing Block Grant - NAHASDA administration, operation, and construction funds
FAA/DOT/PF	2002	Funded	Improve Access Road - Other Share - AKDOT/PF
DCCED	2002	Funded	Heavy Equipment Purchase
HUD	2002	Funded	Indian Housing Block Grant - NAHASDA administration, operation, and construction funds
ANTHC/Denali	2002	Funded	Design New Health Clinic - Denali Commission Funding.
ANTHC/USDA-RD/ DEC	2002	Funded	ANTHC/US Dept of Agriculture-Rural Development (USDA-RD)/Dept of Environmental Conservation (DEC) Landfill Construction; Sanitation Facilities Master Plan - ANTHC lead. USDA/RD $507.0 DEC $169.0 Renovate main lift station and replace septic lift station. Develop new landfill and close old landfill.
ANTHC	2002	Funded	Water and Sewer - Install water and sewer service connections.
Denali	2001	Funded	Fuel Line, Tank Farm Liner - Other Funding = AVEC: $25,000. Bulk Fuel Construction - Fuel Line, Tank Farm Liner
Denali/AVEC	2001	Funded	Alaska Village Electric Consortium (AVEC) Convert distribution system to overhead wiring - Other Funding = AVEC: $20,000. Convert distribution system to overhead wiring
AEA-BF/Denali/AVEC	2001	Funded	Alaska Energy Authority (AEA) Gasoline Fuel Line/Tank Farm Liner - OTHER FUNDING: Denali Commission $225.0; AVEC $25.0
DCCED	2001	Funded	Gas & Oil Equipment and Materials
DCCED	2000	Funded	Renovate Gas and Oil Building and Equipment
HUD	2000	Funded	Indian Housing Block Grant - NAHASDA administration, operation, and construction funds

(DCRA 2009)

This section outlines the four-step process for preparing a mitigation strategy including: developing mitigation goals, identifying mitigation actions, evaluating mitigation actions, and implementing mitigation action plans. The Planning Team developed the following mitigation goals and potential mitigation actions for the City of Huslia.

7.1 DEVELOPING MITIGATION GOALS

The requirements for the local hazard mitigation goals, as stipulated in DMA 2000 and its implementing regulations are described below.

DMA 2000 Requirements: Mitigation Strategy – Local Hazard Mitigation Goals

Local Hazard Mitigation Goals

Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Element

- Does the new or updated plan include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards?

Source: FEMA, July 2008.

The exposure analysis results were used as a basis for developing the mitigation goals and actions. Mitigation goals are defined as general guidelines that describe what a community wants to achieve in terms of hazard and loss prevention. Goal statements are typically long-range, policy-oriented statements representing community-wide visions. As such, 10 goals were developed to reduce or avoid long-term vulnerabilities to the identified hazards (Table 7-1).

Table 7-1 Mitigation Goals

NO.	GOAL DESCRIPTION
1	Promote recognition and mitigation of all natural hazards that affect the City of Huslia.
2	Cross reference mitigation goals and actions with other City of Huslia planning mechanisms and projects.
3	Reduce the possibility of losses from all natural hazards that affect the City of Huslia.
4	Reduce the vulnerability of structures to earthquake damage.
5	Reduce the possibility of damage and losses due to erosion.
6	Reduce the possibility of damage and losses due to drought.
7	Reduce the possibility of damage and losses due to floods.
8	Reduce the possibility of damage and losses due to permafrost.
9	Reduce the vulnerability of structures to severe weather damage.
10	Reduce the possibility of damage and losses due to wildland fire.

7.2 IDENTIFYING MITIGATION ACTIONS

The requirements for the identification and analysis of mitigation actions, as stipulated in DMA 2000 and its implementing regulations are described below.

DMA 2000 Requirements: Mitigation Strategy - Identification and Analysis of Mitigation Actions

Identification and Analysis of Mitigation Actions

Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Element

- Does the new or updated plan identify and analyze a comprehensive range of specific mitigation actions and projects for each hazard?
- Do the identified actions and projects address reducing the effects of hazards on new buildings and infrastructure?
- Do the identified actions and projects address reducing the effects of hazards on existing buildings and infrastructure?

Source: FEMA, July 2008.

After mitigation goals and actions were developed, the Planning Team assessed the potential mitigation actions to carry forward in the mitigation strategy. Mitigation actions are activities, measures, or projects that help achieve the goals of a mitigation plan. Mitigation actions are usually grouped into six broad categories: prevention, property protection, public education and awareness, natural resource protection, emergency services, and structural projects. As listed in Table 7-2, 28 potential mitigation actions were developed, with a particular emphasis placed on projects and programs that reduce the effects of hazards on both new and existing buildings and infrastructure.

DMA 2000 Requirements: Mitigation Strategy - Identification and Analysis of Mitigation Actions: National Flood Insurance Program (NFIP) Compliance

Identification and Analysis of Mitigation Actions: NFIP Compliance

Requirement §201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

Element

- Does the new or updated plan describe the jurisdiction(s) participation in the NFIP?
- Does the mitigation strategy identify, analyze and prioritize actions related to continued compliance with the NFIP?

Source: FEMA, July 2008.

Table 7-2 Mitigation Goals and Potential Actions
(Bold ID items were selected for implantation by the Planning Team)

Goals		Actions	
No.	**Description**	**ID**	**Description**
1	Promote recognition and mitigation of all natural hazards that affect the City of Huslia.	**A**	Hold an annual or biennial "hazard meeting" to provide information to residents about recognition and mitigation of all natural hazards that affect the City of Huslia. Information should be presented in the form of a brochure or different form of written media so that residents can take information with them after the meeting. Topics should include (but are not limited to) the benefits of participating in the **NFIP** and safe fire practices while engaged in various activities (e.g., subsistence) in and around the community to help prevent wildland fires.
		B	Develop pubic outreach program to train earthquake safety; perform drop-cover-hold drills at schools and public facilities.
2	Cross reference Mitigation Goals and Actions with other City of Huslia planning mechanisms and projects.	**A**	Identify potential or funded community or outside agency projects (ANTHC, DCCED, DOT/PF, and HUD etc.) designed to mitigate hazards identified within this HMP.
		B	Review existing community plans and incorporate mitigation philosophy from this plan into appropriate sections of other community plans.
		C	Incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, and land use plans, etc. to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.
3	Reduce possibility of losses from all natural hazards that affect the City of Huslia.	**A**	Identify potential or funded community or outside agency projects (ANTHC, DCCED, AKDOT, and HUD etc.) designed to mitigate hazards identified within this HMP.
		B	Purchase and install generators with main power distribution disconnect switches for identified and prioritized critical facilities susceptible to short-term power disruption. (i.e., first responder and medical facilities, schools, correctional facilities, and water and sewage treatment plants, etc.)
		C	Acquire (buy-out), demolish, or relocate structures from hazard prone area. Property deeds shall be restricted for open space uses in perpetuity to keep people from rebuilding in hazard areas.
		D	Acquire (buy-out), demolish, or relocate structures from hazard prone area. Property deeds shall be restricted for open space uses in perpetuity to keep people from rebuilding in hazard areas.
		E	Identify and list repetitively flooded structures and infrastructures, analyze the threat to these facilities, and prioritize mitigation actions to protect the threatened population.
4	Reduce possibility of damage and losses from drought.	A	Develop an outreach product to teach the community about drought and how it affects the Community's subsistence needs.
5	Reduce vulnerability of structures to earthquake damage.	**A**	Develop pubic outreach program to train earthquake safety; perform drop-cover-hold drills at schools and public facilities.
6	Reduce possibility of damage and losses from erosion.	**A**	Prioritize properties in need of erosion control measures to include identification of specific mitigation measures.
		B	Relocate buildings that are at risk of being affected by erosion.

Table 7-2 Mitigation Goals and Potential Actions
(Bold ID items were selected for implantation by the Planning Team)

Goals		Actions	
No.	**Description**	**ID**	**Description**
		C	Apply for grants/funds to implement riverbank protection methods.
		D	Develop outreach program to educate the public concerning planting process and materials used to stabilize hill slopes or stream banks. This is known as bio-engineering; which uses logs, root wads, wood debris, or other vegetation to reduce scour and erosion.
		E	Install embankment protection such as vegetation, riprap, gabion baskets, sheet piling, and walls to reduce or eliminate erosion.
7	Reduce the possibility of damage and losses from flooding.	**A**	Adopt and enforce floodplain management ordinances.
		B	Acquire (buy-out), relocate, elevate, or otherwise flood-proof identified critical facilities and private properties.
		C	Establish flood mitigation priorities for critical facilities and residential and commercial buildings located within the 100-year floodplain using survey elevation data.
		D	Determine and implement most cost beneficial and feasible mitigation actions for locations with repetitive flooding and significant damages or road closures.
		E	Provide flood protection to mitigate damage and contamination of wastewater treatment systems.
8	Reduce possibility of damage and losses from permafrost.	**A**	Map existing permafrost areas to assist in critical facility relocation siting.
		B	Promote permafrost sensitive construction practices in permafrost areas.
9	Reduce vulnerability of structures to severe weather damage.	**A**	Develop and maintain severe winter storm public outreach program defining mitigation activity benefits through educational outreach aimed at households and businesses while targeting special needs populations.
		B	Develop critical facility list needing emergency back-up power systems, prioritize, seek funding, and implement mitigation actions.
10	Reduce possibility of damage and losses from wildland fires.	**A**	Develop outreach program to educate and encourage fire-safe construction practices for existing and new construction in high risk areas.
		B	Provide wildland fire information in an easily distributed format for all residents.
		C	Identify, develop, implement, and enforce mitigation actions such as fuel breaks and reduction zones for potential wildland fire hazard areas.

7.3 EVALUATING AND PRIORITIZING MITIGATION ACTIONS

The requirements for the evaluation and implementation of mitigation actions, as stipulated in DMA 2000 and its implementing regulations are described below.

DMA 2000 Requirements: Mitigation Strategy - Implementation of Mitigation Actions

Implementation of Mitigation Actions

Requirement: §201.6(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

Element

- Does the new or updated mitigation strategy include how the actions are prioritized?
- Does the new or updated mitigation strategy address how the actions will be implemented and administered?
- Does the new or updated prioritization process include an emphasis on the use of a cost-benefit review to maximize benefits?
- *Does the updated plan identify the completed, deleted or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (i.e., deferred), does the updated plan describe why no changes occurred? (Not applicable until 2014 update)*

Source: FEMA, July 2008.

The Planning Team evaluated and prioritized each of the mitigation actions to determine which actions would be included in the Mitigation Action Plan Matrix. The Mitigation Action Plan Matrix represents mitigation projects and programs to be implemented through the cooperation of multiple entities in the City of Huslia. To complete this task, the Planning Team first prioritized the hazards that were regarded as the most significant within the community (erosion, flood, and severe weather). Erosion is considered the most severely threatening hazard which will determine the community's long-term survival.

The Planning Team reviewed the simplified Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) evaluation criteria (shown in Table 7-3) and the Benefit-Cost Analysis Fact Sheet (Appendix D) to consider the opportunities and constraints of implementing each particular mitigation action. For each action considered for implementation, a qualitative statement is provided regarding the benefits and costs and where available the technical feasibility. A detailed cost-benefit analysis is anticipated as part of the application process for those projects the City chooses to implement.

Table 7-3 STAPLEE Evaluation Criteria for Mitigation Actions

EVALUATION CATEGORY	DISCUSSION "IT IS IMPORTANT TO CONSIDER…"	CONSIDERATIONS
Social	The public support for the overall mitigation strategy and specific mitigation actions.	Community acceptance Adversely affects population
Technical	If the mitigation action is technically feasible and if it is the whole or partial solution.	Technical feasibility Long-term solutions Secondary impacts
Administrative	If the community has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary.	Staffing Funding allocation Maintenance/operations
Political	What the community and its members feel about issues related to the environment, economic development, safety, and emergency management.	Political support Local champion Public support
Legal	Whether the community has the legal authority to implement the action, or whether the community must pass new regulations.	Local, State, and Federal authority Potential legal challenge
Economic	If the action can be funded with current or future internal and external sources, if the costs seem reasonable for the size of the project, and if enough information is available to complete a FEMA Benefit-Cost Analysis.	Benefit/cost of action Contributes to other economic goals Outside funding required FEMA Benefit-Cost Analysis
Environmental	The impact on the environment because of public desire for a sustainable and environmentally healthy community.	Effect on local flora and fauna Consistent with community environmental goals Consistent with local, State, and Federal laws

On June 9, 2009, the hazard mitigation Planning Team prioritized each mitigation action that was chosen to be carried forward in the Mitigation Action Plan Matrix. To determine the priority of the mitigation action, the hazard mitigation Planning Team considered each hazard's history, extent, and probability. A rating system based on *high*, *medium*, or *low* was used. *High* priorities are associated with actions for hazards that impact the community on an annual or near annual basis and generate impacts to critical facilities and/or people. *Medium* priorities are associated with actions for hazards that impact the community less frequently, and do not typically generate impacts to critical facilities and/or people. *Low* priorities are associated with actions for hazards that rarely impact the community and have rarely generated documented impacts to critical facilities and/or people.

Prioritizing the mitigation actions in the Mitigation Action Plan Matrix was completed to provide the City with an approach to implementing the HMP. Table 7-4 provides a summary of the Mitigation Action Plan Matrix priorities.

7.4 IMPLEMENTING A MITIGATION ACTION PLAN

Table 7-4 shows the City of Huslia Mitigation Action Plan Matrix that explains how the mitigation actions were prioritized, how the overall benefit/costs were taken into consideration, and how each mitigation action will be implemented and administered by the Planning Team.

Table 7-4 City of Huslia Mitigation Action Plan Matrix

Action ID	Description	Prioritization	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility
1A	Hold an annual or biennial "hazard meeting" to provide information to residents about recognition and mitigation of all natural hazards that affect the City of Huslia. Information should be presented in the form of a brochure or different form of written media so that residents can take information with them after the meeting. Topics should include (but are not limited to) the benefits of participating in the NFIP and safe fire practices while engaged in various activities (e.g., subsistence) in and around the community to help prevent wildland fires.	High	City of Huslia Staff, Huslia Village Council (In order to obtain ANA funding, the Tribe would need to be the applicant)	Lindbergh Grants Program, HMA, HMGP, AFG, FP&S, SAFER, ANA,, Emergency Food and Shelter Program	ongoing	A sustained mitigation outreach program is minimal in cost and will help build and support community capacity to enable the public to prepare for, respond to, and recover from disasters.
2A	Identify and pursue funding opportunities to implement mitigation actions.	High	City of Huslia Staff, Huslia Village Council	City of Huslia Staff, Huslia Village Council	ongoing	Identifying potential funding sources is minimal in cost and essential for the City to reduce damage and losses from any hazard event. City and Village Council staff are technically capable of researching available funding sources. However, engineering assistance from outside the community may be required for construction projects.
2C	Incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, and land use plans, etc. to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.	Medium	City of Huslia Staff	City of Huslia, Huslia Tribal Council	1-3 years	Coordinated planning ensures effective damage abatement and ensures proper attention is assigned to reduce losses and damage to structures and City residents. This action is feasible with limited fund expenditures.

Table 7-4 City of Huslia Mitigation Action Plan Matrix

Action ID	Description	Prioritization	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility
3A	Identify potential or funded community or outside agency projects (ANTHC, DCCED, AKDOT, and HUD etc.) designed to mitigate hazards identified within this HMP.	Medium	City of Huslia	City of Huslia, Huslia Tribal Council	1-3 years	Coordinated planning ensures effective damage abatement and ensures proper attention is assigned to reduce losses and damage to structures and City residents. This action is feasible with limited fund expenditures.
3B	Purchase and install generators with main power distribution disconnect switches for identified and prioritized critical facilities susceptible to short-term power disruption. (i.e., first responder and medical facilities, schools, correctional facilities, and water and sewage treatment plants, etc.)	High	City of Huslia Staff, Huslia Village Council	Lindbergh Grants Program, HMA, HMGP, AFG, FP&S, SAFER, ANA,, Emergency Food and Shelter Program	1-5 years	Emergency power generation is a minor cost to protect vital infrastructure from hazard damage. Installing emergency generators is technically feasible for this community as they already have staff to maintain existing community power generation facilities.
5A	Develop pubic outreach program to train earthquake safety; perform drop-cover-hold drills at schools and public facilities.	Low	City of Huslia, Huslia Tribal Council	Lindbergh Grants Program, HMA, HMGP, AFG, FP&S, SAFER, ANA,, Emergency Food and Shelter Program	2-4 years	A sustained mitigation outreach program is minimal in cost and will help build and support community capacity to enable the public to prepare for, respond to, and recover from disasters.
6A	Prioritize properties in need of erosion control measures to include identification of specific mitigation measures.	High	City of Huslia, Huslia Tribal Council	City of Huslia, Huslia Tribal Council	1-2 Years	Identifying erosion threatened structure priority is essential and will incur minimal cost and essential for the City to reduce damage and losses from any hazard event. City and Village Council staff are technically capable of

Table 7-4 City of Huslia Mitigation Action Plan Matrix

Action ID	Description	Prioritization	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility
						researching available funding sources. However, engineering assistance from outside the community may be required for construction projects.
6B	Relocate buildings that are at risk of being affected by erosion.	High	City of Huslia, Huslia Tribal Council	Lindbergh Grants Program, HMA, HMGP, AFG, FP&S, SAFER, ANA,, Emergency Food and Shelter Program	ongoing	Relocation costs are minor compared to building replacement due to the community's rural location where materials shipping is exceedingly expensive. The project is technically feasible as the community has staff and resources they have used to relocate and elevate buildings.
6C	Apply for grants/funds to implement riverbank protection methods.	High	City of Huslia, Huslia Tribal Council	Lindbergh Grants Program, HMA, HMGP, AFG, FP&S, SAFER, ANA,, Emergency Food and Shelter Program	ongoing	Identifying potential funding sources is minimal in cost and essential for the City to reduce damage and losses from any hazard event. City and Village Council staff are technically capable of researching available funding sources. However, engineering assistance from outside the community may be required for construction projects.
8D	Develop outreach program to educate the public concerning planting process and materials used to stabilize hill slopes or stream banks. This is known as bio-engineering; which uses logs, root wads, wood debris, or other	High	City of Huslia, Huslia Tribal Council	Lindbergh Grants Program, HMA, HMGP, AFG, FP&S, SAFER, ANA,, Emergency Food and Shelter Program	2-4 years	A sustained mitigation outreach program is minimal in cost and will help build and support community capacity to enable the public to prepare for, respond to, and recover from disasters.

Table 7-4 City of Huslia Mitigation Action Plan Matrix

Action ID	Description	Prioritization	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility
	vegetation to reduce scour and erosion.					
6E	Install embankment protection such as vegetation, riprap, gabion baskets, sheet piling, and walls to reduce or eliminate erosion.	High	City of Huslia, Huslia Tribal Council	Lindbergh Grants Program, HMA, HMGP, AFG, FP&S, SAFER, ANA,, Emergency Food and Shelter Program	2-5 years	Providing embankment protection will greatly reduce infrastructure and residential losses. Costs would out weigh replacement costs of lost facilities. Technically feasible as the community has the skill to implement this action. Specialized materials and equipment may need to be barged in depending on the method selected.
7A	Adopt and enforce floodplain management ordinances.	High	City of Huslia, Huslia Tribal Council	City of Huslia Staff, Huslia Village Council	ongoing	A Floodplain ordinance is in place and used to site facilities and plan for future growth.
7B	Acquire (buy-out), relocate, elevate, or otherwise flood-proof identified critical facilities and private properties.	High	City of Huslia, Huslia Tribal Council	HMA, HMGP, AFG, FP&S, SAFER, ANA,, Emergency Food and Shelter Program	3-5 years	Acquisition, relocation, and elevation costs are minor compared to building replacement due to the community's rural location where materials shipping is exceedingly expensive. The project is technically feasible as the community has staff and resources they have used to relocate and elevate buildings.
8A	Map existing permafrost areas to assist in critical facility relocation siting	Medium	City of Huslia, Huslia Tribal Council	Lindbergh Grants Program, ANA,, Emergency Food and Shelter Program	4 years	Identifying permafrost locations is a minimal cost which would decrease damage to facilities sited inappropriately

Table 7-4 City of Huslia Mitigation Action Plan Matrix

Action ID	Description	Prioritization	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility
						Technically feasible as the community currently has identified permafrost locations but they have not created a map defining the area and they dig test holes to determine permafrost depth prior to construction.
9A	Develop and maintain severe winter storm public outreach program defining mitigation activity benefits through educational outreach aimed at households and businesses while targeting special needs populations.	Medium	City of Huslia f, Huslia Tribal Council	Lindbergh Grants Program, HMA, HMGP, AFG, FP&S, SAFER, ANA,, Emergency Food and Shelter Program	2-4 years	A sustained mitigation outreach program is minimal in cost and will help build and support community capacity to enable the public to prepare for, respond to, and recover from disasters.
10A	Develop outreach program to educate and encourage fire-safe construction practices for existing and new construction in high risk areas.	Low	City of Huslia, Huslia Tribal Council	Lindbergh Grants Program, HMA, HMGP, AFG, FP&S, SAFER, ANA,, Emergency Food and Shelter Program	2-4 years	A sustained mitigation outreach program is minimal in cost and will help build and support community capacity to enable the public to prepare for, respond to, and recover from disasters.

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This section describes a formal plan maintenance process to ensure that the HMP remains an active and applicable document. It includes an explanation of how the City of Huslia Planning Team intends to organize their efforts to ensure that improvements and revisions to the HMP occur in a well-managed, efficient, and coordinated manner.

The following three process steps are addressed in detail here:

- Monitoring, evaluating, and updating the HMP.
- Implementation through existing planning mechanisms.
- Continued public involvement.

8.1 MONITORING, EVALUATING, AND UPDATING THE HMP

The requirements for monitoring, evaluating, and updating the HMP, as stipulated in the DMA 2000 and its implementing regulations are described below.

DMA 2000 Requirements: Plan Maintenance Process - Monitoring, Evaluating, and Updating the Plan

Monitoring, Evaluating and Updating the Plan

Requirement §201.6(c)(4)(i): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Element

- Does the new or updated plan describe the method and schedule for monitoring the plan, including the responsible department?
- Does the new or updated plan describe the method and schedule for evaluating the plan, including how, when and by whom (i.e., the responsible department?
- Does the new or updated plan describe the method and schedule for updating the plan within the five-year cycle?

Source: FEMA, July 2008.

The HMP was prepared as a collaborative effort among the Planning Team Members. To maintain momentum and build upon previous hazard mitigation planning efforts and successes, the City of Huslia will use the Planning Team to monitor, evaluate, and update the HMP. Each authority identified in Table 7-4 will be responsible for implementing the Mitigation Action Plan. The City Administrator of Huslia, the hazard mitigation Planning Team Leader, (or designee) will serve as the primary point of contact and will coordinate local efforts to monitor, evaluate, and revise the HMP.

The Planning Team will conduct an annual review during the anniversary week of the plan's official FEMA approval date to monitor the progress in implementing the HMP, particularly the Mitigation Action Plan. As shown in Appendix E, the Annual Review Worksheet will provide the basis for possible changes in the HMP Mitigation Action Plan by refocusing on new or more threatening hazards, adjusting to changes to or increases in resource allocations, and engaging additional support for the HMP implementation. The Planning Team Leader will initiate the annual review two months prior to the scheduled planning meeting date to ensure that all data is assembled for discussion with the Planning Team. The findings from these reviews will be presented at the annual Planning Team meeting. Each review, as shown on the Annual Review Worksheet, will include an evaluation of the following:

- Participation of authorities and others in the HMP implementation.
- Notable changes in the risk of natural or human-caused hazards.
- Impacts of land development activities and related programs on hazard mitigation.
- Progress made with the Mitigation Action Plan (identify problems and suggest improvements as necessary).
- The adequacy of local resources for implementation of the HMP.

A system of reviewing the progress on achieving the mitigation goals and implementing the Mitigation Action Plan activities and projects will also be accomplished during the annual review process. During each annual review, each authority administering a mitigation project will submit a Progress Report to the Planning Team. As shown in Appendix E, the report will include the current status of the mitigation project, including any changes made to the project, the identification of implementation problems and appropriate strategies to overcome them, and whether or not the project has helped achieved the appropriate goals identified in the plan.

In addition to the annual review, the Planning Team will update the HMP every five years. To ensure that this update occurs, in the third year following adoption of the HMP, the Planning Team will undertake the following activities:

- Request grants assistance for DHS&EM to update the HMP (this can take up to one year to obtain funding and one year to update the plan).
- Thoroughly analyze and update the risk of natural and human-made hazards.
- Provide a new annual review (as noted above), plus a review of the three previous annual reviews.
- Provide a detailed review and revision of the mitigation strategy.
- Prepare a new Mitigation Action Plan for the City of Huslia.
- Prepare a new draft HMP.
- Submit an updated HMP to the DH&EM and FEMA for approval.
- Submit the FEMA approved plan for adoption by the City of Huslia.

8.2 IMPLEMENTATION THROUGH EXISTING PLANNING MECHANISMS

The requirements for implementation through existing planning mechanisms, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Plan Maintenance Process - Incorporation into Existing Planning Mechanisms

Incorporation into Existing Planning Mechanisms

Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Element

- Does the new or updated plan identify other local planning mechanisms available for incorporating the mitigation requirements of the mitigation plan?
- Does the new or updated plan include a process by which the local government will incorporate the mitigation strategy and other information contained in the plan (e.g., risk assessment) into other planning mechanisms, when appropriate?
- *Does the updated plan explain how the local government incorporated the mitigation strategy and other information contained in the plan (e.g., risk assessment) into other planning mechanisms, when appropriate? (Not applicable until 2014 update)*

Source: FEMA, July 2008.

After the adoption of the HMP, each Planning Team Member will ensure that the HMP, in particular each Mitigation Action Project, is incorporated into existing planning mechanisms. Each member of the Planning Team will achieve this incorporation by undertaking the following activities.

- Conduct a review of the community-specific regulatory tools to assess the integration of the mitigation strategy. These regulatory tools are identified in the following capability assessment section.
- Work with pertinent community departments to increase awareness of the HMP and provide assistance in integrating the mitigation strategy (including the Mitigation Action Plan) into relevant planning mechanisms. Implementation of these requirements may require updating or amending specific planning mechanisms.

8.3 CITY OF HUSLIA CAPABILITY ASSESSMENT

The City of Huslia capability assessment reviews the technical and fiscal resources available to the community. This section outlines the resources available to the City of Huslia for mitigation and mitigation related funding and training.

Table 8-1 City of Huslia Regulatory Tools

REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	EXISTING?	COMMENTS (YEAR OF MOST RECENT UPDATE; PROBLEMS ADMINISTERING IT, ETC)
Building code	No	
Zoning ordinances	No	
Subdivision ordinances or regulations	No	
Special purpose ordinances	No	
Comprehensive Plan	No	
Economic Development Plan	Yes	• Huslia Comprehensive Community Development Plan, 1999
Emergency Response Plan	No	
Land Use Ordinance	No	
Land Use Plan	No	

Federal Resources

The Federal government requires local governments to have a HMP in place to be eligible for mitigation funding opportunities through FEMA such as the UHMA Programs and the HMGP. The Mitigation Technical Assistance Programs available to local governments are also a valuable resource. FEMA may also provide temporary housing assistance through rental assistance, mobile homes, furniture rental, mortgage assistance, and emergency home repairs. The Disaster Preparedness Improvement Grant also promotes educational opportunities with respect to hazard awareness and mitigation.

- FEMA, through its Emergency Management Institute, offers training in many aspects of emergency management, including hazard mitigation. FEMA has also developed a large number of documents that address implementing hazard mitigation at the local level. Five key resource documents are available from FEMA Publication Warehouse (1-800-480-2520) and are briefly described here:
    - How-to Guides. FEMA has developed a series of how-to guides to assist states, communities, and tribes in enhancing their hazard mitigation planning capabilities. The first four guides describe the four major phases of hazard mitigation planning. The last five How-to Guides address special topics that arise in hazard mitigation planning such as conducting cost-benefit analysis and preparing multi-jurisdictional plans. The use of worksheets, checklists, and tables make these guides a practical source of guidance to address all stages of the HMP process. They also include special tips on meeting DMA 2000 requirements (http://www.fema.gov/fima/planhowto.shtm).
    - Post-Disaster Hazard Mitigation Planning Guidance for State and Local Governments. FEMA DAP-12, September 1990. This handbook explains the basic concepts of hazard mitigation and shows state and local governments how they can develop and achieve mitigation goals within the context of FEMA's post-disaster hazard mitigation planning requirements. The handbook focuses on approaches to mitigation, with an emphasis on multi-objective planning.
    - Mitigation Resources for Success compact disc (CD). FEMA 372, September 2001. This CD contains a wealth of information about mitigation and is useful for state and local government planners and other stakeholders in the mitigation process. It provides mitigation case studies, success stories, information about Federal mitigation programs, suggestions for mitigation measures to homes and businesses, appropriate relevant mitigation publications, and contact information.
    - A Guide to Federal Aid in Disasters. FEMA 262, April 1995. When disasters exceed the capabilities of State and local governments, the President's Disaster Assistance Program (administered by FEMA) is the primary source of Federal assistance. This handbook discusses the procedures and process for obtaining this assistance, and provides a brief overview of each program.
    - The Emergency Management Guide for Business and Industry. FEMA 141, October 1993. This guide provides a step-by-step approach to emergency management planning, response, and recovery. It also details a planning process that businesses can follow to better prepare for a wide range of hazards and

emergency events. This effort can enhance a business's ability to recover from financial losses, loss of market share, damages to equipment, and product or business interruptions. This guide could be of great assistance to a community's industries and businesses located in hazard prone areas.

- Department of Agriculture (USDA). Assistance provided includes: Emergency Conservation Program, Non-Insured Assistance, Emergency Watershed Protection, Rural Housing Service, Rural Utilities Service, and Rural Business and Cooperative Service.
- Department of Energy (USDOE), Office of Energy Efficiency and Renewable Energy, Weatherization Assistance Program. This program minimizes the adverse effects of high energy costs on low-income, elderly, and handicapped citizens through client education activities and weatherization services such as an all-around safety check of major energy systems, including heating system modifications and insulation checks.
- Department of Health and Human Services (DHHS), Administration of Children & Families, Administration for Native Americans (ANA). The ANA awards funds through grants to American Indians, Native Americans, Native Alaskans, Native Hawaiians, and Pacific Islanders. These grants are awarded to individual organizations that successfully apply for discretionary funds. ANA publishes in the Federal Register an announcement of funds available, the primary areas of focus, review criteria, and the method of application (http://www.acf.hhs.gov/programs/ana/).
- Department of Housing and Urban Development (HUD), Office of Homes and Communities, Section 108 Loan Guarantee Programs. This program provides loan guarantees as security for Federal loans for acquisition, rehabilitation, relocation, clearance, site preparation, special economic development activities, and construction of certain public facilities and housing.
- Department of Housing and Urban Development, Community Development Block Grants (HUD/CDBG). Provides grant assistance and technical assistance to aid communities in planning activities that address issues detrimental to the health and safety of local residents, such as housing rehabilitation, public services, community facilities, and infrastructure improvements that would primarily benefit low-and moderate-income persons.
- Department of Labor, Employment and Training Administration, Disaster Unemployment Assistance. Provides weekly unemployment subsistence grants for those who become unemployed because of a major disaster or emergency. Applicants must have exhausted all benefits for which they would normally be eligible.
- Federal Financial Institutions. Member banks of Federal Deposit Insurance Corporation, Financial Reporting Standards or Federal Home Loan Bank Board may be permitted to waive early withdrawal penalties for Certificates of Deposit and Individual Retirement Accounts.

- Internal Revenue Service (IRS), Tax Relief. Provides extensions to current year's tax return, allows deductions for disaster losses, and allows amendment of previous tax returns to reflect loss back to three years.
- USACE. The USACE Alaska District's Civil Works Branch studies potential water resource projects in Alaska. These studies analyze and solve water resource issues of concern to the local communities. These issues may involve navigational improvements, flood control or ecosystem restoration. The agency also tracks flood hazard data for over 300 Alaskan communities on floodplains or the sea coast. These data help local communities assess the risk of floods to their communities and prepare for potential future floods. The USACE is a member and co-chair of the Alaska Climate Change Sub-Cabinet.
- U.S. Small Business Administration (SBA). May provide low-interest disaster loans to individuals and businesses that have suffered a loss due to a disaster. Requests for SBA loan assistance should be submitted to DHS&EM.

State Resources

- DHS&EM is responsible for improving hazard mitigation technical assistance for local governments for the State of Alaska. Providing hazard mitigation training, current hazard information, and communication facilitation with other agencies will enhance local hazard mitigation efforts. DHS&EM administers FEMA mitigation grants to mitigate future disaster damages such as those that may affect infrastructure including the elevation, relocation, or acquisition of hazard-prone properties. DHS&EM also provides mitigation funding resources for mitigation planning on their web site at http://www.ak-prepared.com/plans/mitigation/mitigati.htm.
- Division of Senior Services: Provides special outreach services for seniors, including food, shelter and clothing.
- Division of Insurance: Provides assistance in obtaining copies of policies and provides information regarding filing claims.
- Department of Military and Veteran's Affairs (DMVA): Provides damage appraisals and settlements for VA-insured homes, and assists with filing of survivor benefits.
- The Community Health and Emergency Medical Services (CHEMS) is a section within Division of Public Health within the Department of Health and Social Services (DHSS). DHSS is charged with promoting and protecting the public health and one of CHEMS' responsibilities is developing, implementing, and maintaining a statewide comprehensive emergency medical services system. The department's statutory mandate (Alaska Statute 18.08.010) requires it to:

  (1) Coordinate public and private agencies engaged in the planning and delivery of emergency medical services, including trauma care, to plan an emergency medical services system.

  (2) Assist public and private agencies to deliver emergency medical services, including trauma care, through the award of grants in aid.

(3) Conduct, encourage, and approve programs of education and training designed to upgrade the knowledge and skills of health personnel involved in emergency medical services, including trauma care.

(4) Establish and maintain a process under which hospitals and clinics can represent themselves to be trauma centers because they voluntarily meet criteria adopted by the department which are based on an applicable national evaluation system.

- DCCED/DCRA. DCRA administers the HUD/CDBG, FMA Program, and the Climate Change Sub-Cabinet's Interagency Working Group's program funds and administers various flood and erosion mitigation projects, including the elevation, relocation, or acquisition of flood-prone homes and businesses, throughout the State. This department also administers programs for State "distressed" and "targeted" communities.
- Division of Environmental Conservation (DEC). DEC's primary roles and responsibilities concerning hazards mitigation are ensuring safe food and safe water, and pollution prevention and pollution response. DEC ensures water treatment plants, landfills, and bulk fuel storage tank farms are safely constructed and operated in communities. Agency and facility response plans include hazards identification and pollution prevention and response strategies.
- Department of Transportation and Public Facilities (DOT/PF). DOT/PF personnel provide technical assistance to the various emergency management programs, to include mitigation. This assistance is addressed in the DHS&EM-DOT/PF Memorandum of Agreement and includes, but is not limited to: environmental reviews; archaeological surveys; and historic preservation reviews.

  In addition, DOT/PF and DHS&EM coordinate buy-out projects to ensure that there are no potential right-of-way conflicts with future use of land for bridge and highway projects, and collaborate on earthquake mitigation.

  Additionally, DOT/PF provides safe, efficient, economical, and effective operation of the State's highways, harbors, and airports. DOT/PF uses it's Planning, Design and Engineering, Maintenance and Operations, and Intelligent Transportation Systems resources to identify the hazard, plan and initiate mitigation activities to meet the transportation needs of Alaskans and make Alaska a better place to live and work. DOT/PF budgets for the temporary replacement bridges and materials necessary to make the multi-model transportation system operational following a natural disaster.
- DNR administers various projects designed to reduce stream bank erosion, reduce localized flooding, improve drainage, and improve discharge water quality through the stormwater grant program funds. Within DNR, the Division of Geological and Geophysical Survey (DGGS) is responsible for the use and development of Alaska's mineral, land, and water resources, and collaboration on earthquake mitigation.
  - The DNR's Division of Forestry (DOF). DOF participates in a statewide wildfire control program in cooperation with the forest industry, rural fire departments and other agencies. Prescribed burning may increase the risks of fire hazards; however, prescribed burning reduces the availability of fire fuels and therefore the potential for future, more serious fires.

- DOF also manages various wildland fire programs, activities, and grant programs such as the FireWise Program, the Community Forestry Program and the Volunteer Fire Assistance and Rural Fire Assistance Grant programs. Information can be found at http://forestry.alaska.gov/fire/current.htm.

Other Funding Sources and Resources

The following provide focused access to valuable planning resources for communities interested in sustainable development activities.

- FEMA, http://www.fema.gov - includes links to information, resources, and grants that communities can use in planning and implementation of sustainable measures.
- American Planning Association (APA), http://www.planning.org - a non-profit professional association that serves as a resource for planners, elected officials, and citizens concerned with planning and growth initiatives.
- Institute for Business and Home Safety (IBHS), http://ibhs.org - an initiative of the insurance industry to reduce deaths, injuries, property damage, economic losses, and human suffering caused by natural disasters.
- American Red Cross (ARC). Provides for the critical needs of individuals such as food, clothing, shelter, and supplemental medical needs. Provides recovery needs such as furniture, home repair, home purchasing, essential tools, and some bill payment may be provided.
- Crisis Counseling Program. Provides grants to State and Borough Mental Health Departments, which in turn provide training for screening, diagnosing, and counseling techniques. Also provides funds for counseling, outreach, and consultation for those affected by disaster.

Local Resources

The City of Huslia has a limited number of planning, land, and financial management tools to implement hazard mitigation activities. The resources available in these areas have been assessed by the hazard mitigation Planning Team, and are summarized in Tables 8-2 and 8-3 below.

Table 8-2 City of Huslia Staff Resources

Staff / Personnel Resources	Y / N	Department / Agency and Position
Planner or engineer with knowledge of land development and land management practices	No	ANTHC provides Planner/Engineering Support
Engineer or professional trained in construction practices related to buildings and/or infrastructure	No	ANTHC provides Planner/Engineering Support
Planner or engineer with an understanding of natural and/or human-caused hazards	No	ANTHC provides Planner/Engineering Support
Floodplain Manager	No	Taunnie Boothby, State Floodplain Manager
Surveyors	No	City may hire surveying consulting services
Staff with education or expertise to assess the jurisdiction's vulnerability to hazards	No	
Personnel skilled in GIS and/or HAZUS	No	
Scientists familiar with the hazards of the jurisdiction	No	US Federal Wildlife Service (USFWS) local office; AK Dept. of Fish & Game (ADF&G) local office
Emergency manager	Yes	Fire Chief
Grant writers	No	

Table 8-3 City of Huslia Financial Resources

Financial Resources	Accessible or Eligible to Use (Yes / No / DK-Don't Know)
Community Development Block Grants	Yes
Capital Improvement Projects Funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for water, sewer, gas, or electric service	No
Impact fees for homebuyers or developers for new developments/homes	No
Withhold spending in hazard-prone areas	No

8.4 CONTINUED PUBLIC INVOLVEMENT

The requirements for continued public involvement, as stipulated in the DMA 2000 and its implementing regulations are described below.

DMA 2000 Requirements: Plan Maintenance Process - Continued Public Involvement

Continued Public Involvement

Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

Element

- Does the new or updated plan explain how continued public participation will be obtained?

Source: FEMA, July 2008.

The City of Huslia is dedicated to involving the public directly in the continual reshaping and updating of the HMP as depicted in their Mitigation Actions Plan Matrix, Table 7-4, five of their implemented Mitigation Actions (1A, 5A, 6D, 9A, and 10A) are outreach activities focused to keeping their population involved and aware of the hazards threatening their community.

A paper copy of the HMP and any proposed changes will be available at City Office. An address and phone number of the Planning Team Leader, to whom people can direct their comments or concerns will also be available at City Office.

The Planning Team will also identify opportunities to raise community awareness about the HMP and the hazards that affect the area. This effort could include attendance and provision of materials at city-sponsored events, outreach programs, and public mailings. Any public comments received regarding the HMP will be collected by the Planning Team Leader, included in the annual report, and considered during future HMP updates.

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Appendix A

Crosswalk

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LOCAL MITIGATION PLAN REVIEW SUMMARY

The plan cannot be approved if the plan has not been formally adopted. Each requirement includes separate elements. All elements of the requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a score of "Satisfactory." Elements of each requirement are listed on the following pages of the Plan Review Crosswalk. A "Needs Improvement" score on elements shaded in gray (recommended but not required) will not preclude the plan from passing. Reviewer's comments must be provided for requirements receiving a **"Needs Improvement"** score.

Prerequisite(s) (Check Applicable Box)	**NOT MET**	**MET**
1. Adoption by the Local Governing Body: §201.6(c)(5) OR		X
2. Multi-Jurisdictional Plan Adoption: §201.6(c)(5) **AND**		N/A
3. Multi-Jurisdictional Planning Participation: §201.6(a)(3)		N/A

Planning Process	**N**	**S**
4. Documentation of the Planning Process: §201.6(b) and §201.6(c)(1)		X

Risk Assessment	**N**	**S**
5. Identifying Hazards: §201.6(c)(2)(i)		X
6. Profiling Hazards: §201.6(c)(2)(i)		X
7. Assessing Vulnerability: Overview: §201.6(c)(2)(ii)		X
8. Assessing Vulnerability: Addressing Repetitive Loss Properties. §201.6(c)(2)(ii)		X
9. Assessing Vulnerability: Identifying Structures, Infrastructure, and Critical Facilities: §201.6(c)(2)(ii)(B)		X
10. Assessing Vulnerability: Estimating Potential Losses: §201.6(c)(2)(ii)(B)		X
11. Assessing Vulnerability: Analyzing Development Trends: §201.6(c)(2)(ii)(C)		X
12. Multi-Jurisdictional Risk Assessment: §201.6(c)(2)(iii)		N/A

*States that have additional requirements can add them in the appropriate sections of the *Local Multi-Hazard Mitigation Planning Guidance* or create a new section and modify this Plan Review Crosswalk to record the score for those requirements.

SCORING SYSTEM

Please check one of the following for each requirement.

N – Needs Improvement: The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.

S – Satisfactory: The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

Mitigation Strategy	**N**	**S**
13. Local Hazard Mitigation Goals: §201.6(c)(3)(i)		X
14. Identification and Analysis of Mitigation Actions: §201.6(c)(3)(ii)		X
15. Identification and Analysis of Mitigation Actions: NFIP Compliance. §201.6(c)(3)(ii)		X
16. Implementation of Mitigation Actions: §201.6(c)(3)(iii)		X
17. Multi-Jurisdictional Mitigation Actions: §201.6(c)(3)(iv)		N/A

Plan Maintenance Process	**N**	**S**
18. Monitoring, Evaluating, and Updating the Plan: §201.6(c)(4)(ii)		X
19. Incorporation into Existing Planning Mechanisms: §201.6(c)(4)(ii)		X
20. Continued Public Involvement: §201.6(c)(4)(iii)		X

Additional State Requirements*	**N**	**S**
Insert State Requirement		
Insert State Requirement		
Insert State Requirement		

LOCAL MITIGATION PLAN APPROVAL STATUS

PLAN NOT APPROVED	
See Reviewer's Comments	
PLAN APPROVED	X

LOCAL MITIGATION PLAN REVIEW CROSSWALK

Local Mitigation Plan Review and Approval Status

Jurisdiction: City of Huslia	**Title of Plan:** City of Huslia Hazard Mitigation Plan	**Date of Plan:** December 2009
Local Point of Contact: Elsie Vent	**Address:** City of Huslia P.O. Box 10 Huslia, AK 99746	
Title: City Administrator		
Agency: City of Huslia		
Phone Number: 907.892.2266	**E-Mail:** elsiesv@gci.net	

State Reviewer: Andy Jones	**Title:** EMS III	**Date:** November 2, 2009

FEMA Reviewer: Brett Holt	**Title:** Mitigation Planner	**Date:** December 8, 2009
Date Received in FEMA Region	November 14, 2009	
Plan Not Approved		
Plan Approved	X	
Date Approved	**February 23, 2010**	

Jurisdiction:	**NFIP Status***			
	Y	**N**	**N/A**	**CRS Class**
1. City of Huslia		X		
2.				
3.				
4.				

*** Notes:** **Y = Participating** **N = Not Participating** **N/A = Not Mapped**

PREREQUISITE(S)

1. Adoption by the Local Governing Body

***Requirement §201.6(c)(5)*:** *[The local hazard mitigation plan **shall** include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Has the local governing body adopted **new** or updated plan?	p. 2-1	The jurisdiction adopted the plan.		X
B. Is supporting documentation, such as a resolution, included?	Appendix B	The jurisdiction submitted a resolution.		X
		SUMMARY SCORE		X

2. Multi-Jurisdictional Plan Adoption

***Requirement §201.6(c)(5)*:** *For multi-jurisdictional plans, each jurisdiction requesting approval of the plan **must** document that it has been formally adopted.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Does the **new** or updated plan indicate the specific jurisdictions represented in the plan?	N/A			N/A
B. For each jurisdiction, has the local governing body adopted the **new or updated** plan?	N/A			N/A
C. Is supporting documentation, such as a resolution, included for each participating jurisdiction?	N/A			N/A
		SUMMARY SCORE		N/A

3. Multi-Jurisdictional Planning Participation

***Requirement §201.6(a)(3)*:** *Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process … Statewide plans will not be accepted as multi-jurisdictional plans.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Does the **new or updated** plan describe **how** each jurisdiction participated in the plan's development?	N/A			N/A
B. Does the updated plan identify all participating jurisdictions, including new, continuing, and the jurisdictions that no longer participate in the plan?	N/A			N/A
		SUMMARY SCORE		N/A

PLANNING PROCESS: *§201.6(b): An open public involvement process is essential to the development of an effective plan.*

4. Documentation of the Planning Process

Requirement §201.6(b): *In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process* ***shall*** *include:*
(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.6(c)(1): *[The plan* ***shall*** *document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan provide a narrative description of the process followed to prepare the **new** or updated plan?	pp. 4-1 to 4-2	The planning process is described.		X
B. Does the **new** or updated plan indicate who was involved in the **current** planning process? (For example, who led the development at the staff level and were there any external contributors such as contractors? Who participated on the plan committee, provided information, reviewed drafts, *etc*.?)	p. 4-2 Table 4-1	City officials, community members, and state officials participated.		X
C. Does the **new** or updated plan indicate how the public was involved? (Was the public provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?)	p. 4-3 Table 4-2, Appendix C	Two public meetings were held and a newsletter was distributed.		X
D. Does the **new** or updated plan discuss the opportunity for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process?	p. 4-3	Opportunities existed for community members and organizations to participate.		X
E. Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?	p. 4-4, Section 9	A number of existing plans and other information were incorporated. References are provided in Section 9.		X
F. Does the updated plan document how the planning team reviewed and analyzed each section of the plan and whether each section was revised as part of the update process?	N/A			N/A
		SUMMARY SCORE		X

RISK ASSESSMENT: *§201.6(c)(2): The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.*

5. Identifying Hazards

Requirement §201.6(c)(2)(i): *[The risk assessment **shall** include a] description of the type … of all natural hazards that can affect the jurisdiction.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new** or updated plan include a description of the types of all natural hazards that affect the jurisdiction?	p. 5-1 to 5-2	The Planning Team determined that seven hazards pose the greatest threat to the City: drought, earthquake, erosion, flood, permafrost, severe weather, and wildland fire.		X
		SUMMARY SCORE		X

6. Profiling Hazards

Requirement §201.6(c)(2)(i): *[The risk assessment **shall** include a] description of the … location and extent of all natural hazards that can affect the jurisdiction. The plan **shall** include information on previous occurrences of hazard events and on the probability of future hazard events.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the risk assessment identify the **location** (*i.e.*, geographic area affected) of each natural hazard addressed in the **new** or updated plan?	Section 5	The location of each natural hazard is identified.		X
B. Does the risk assessment identify the **extent** (*i.e.*, magnitude or severity) of each hazard addressed in the **new** or updated plan?	Section 5	The extent of each hazard is described.		X
C. Does the plan provide information on **previous occurrences** of each hazard addressed in the **new** or updated plan?	Section 5	Previous occurrences of each hazard are provided.		X
D. Does the plan include the **probability of future events** (*i.e.*, chance of occurrence) for each hazard addressed in the **new** plan?	Section 5	The plan includes the probability of future events for each hazard.		X
		SUMMARY SCORE		X

7. Assessing Vulnerability: Overview

Requirement §201.6(c)(2)(ii): *[The risk assessment **shall** include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description **shall** include an overall summary of each hazard and its impact on the community.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new** or updated plan include an **overall summary** description of the jurisdiction's **vulnerability** to each hazard?	Section 6	An overall summary description of the jurisdiction's vulnerability is included.		X
B. Does the **new** or updated plan address the **impact** of each hazard on the jurisdiction?	Section 5	The impacts are addressed in each hazard profile.		X
		SUMMARY SCORE		X

8. Assessing Vulnerability: Addressing Repetitive Loss Properties

Requirement §201.6(c)(2)(ii): *[The risk assessment] **must** also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged floods.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new** or updated plan describe vulnerability in terms of the types and numbers of *repetitive loss properties* located in the identified hazard areas?	p. 6-3 Section 6.2.1.2	The City does not participate in the NFIP. The City does not have a repetitive loss property inventory that meets the repetitive loss or severe repetitive loss criteria.		X
		SUMMARY SCORE		X

9. Assessing Vulnerability: Identifying Structures

Requirement §201.6(c)(2)(ii)(A): *The plan **should** describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area … .*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new** or updated plan describe vulnerability in terms of the **types and numbers** of **existing** buildings, infrastructure, and critical facilities located in the identified hazard areas?	Section 6	The plan describes vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas		X
B. Does the **new** or updated plan describe vulnerability in terms of the **types and numbers** of **future** buildings, infrastructure, and critical facilities located in the identified hazard areas?	p. 6-6	Future development is described.		X
		SUMMARY SCORE		X

10. Assessing Vulnerability: Estimating Potential Losses

Requirement §201.6(c)(2)(ii)(B): *[The plan **should** describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate … .*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new** or updated plan estimate **potential dollar losses** to vulnerable structures?	p. 6-7, Table 6-3	A potential hazard exposure analysis is provided.		X
B. Does the **new** or updated plan describe the **methodology** used to prepare the estimate?	p. 6-6	The methodology is described.		X
		SUMMARY SCORE		X

11. Assessing Vulnerability: Analyzing Development Trends

Requirement §201.6(c)(2)(ii)(C): *[The plan **should** describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new** or updated plan describe land uses and development trends?	p. 6-10 to 6-11, Table 6-4 & 6-5	*Land uses and development trends are described.*		X
		SUMMARY SCORE		X

12. Multi-Jurisdictional Risk Assessment

Requirement §201.6(c)(2)(iii): *For multi-jurisdictional plans, the risk assessment **must** assess each jurisdiction's risks where they vary from the risks facing the entire planning area.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new** or updated plan include a risk assessment for each participating jurisdiction as needed to reflect unique or varied risks?	N/A			N/A
		SUMMARY SCORE		N/A

MITIGATION STRATEGY: *§201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.*

13. Local Hazard Mitigation Goals

Requirement §201.6(c)(3)(i): *[The hazard mitigation strategy **shall** include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A Does the **new** or updated plan include a description of mitigation **goals** to reduce or avoid long-term vulnerabilities to the identified hazards?	p. 7-1 Table 7-1	10 goals are developed.		X
		SUMMARY SCORE		X

14. Identification and Analysis of Mitigation Actions

Requirement §201.6(c)(3)(ii): *[The mitigation strategy **shall** include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new** or updated plan identify and analyze a **comprehensive range** of specific mitigation actions and projects for each hazard?	pp. 7-2 to 7-3	A comprehensive range of mitigation actions are identified.		X
B Do the identified actions and projects address reducing the effects of hazards on **new** buildings and infrastructure?	pp. 7-2 to 7-3	Actions address reducing the effects of hazards on existing and new buildings.		X
C. Do the identified actions and projects address reducing the effects of hazards on **existing** buildings and infrastructure?	pp. 7-2 to 7-3	See above comment.		X
		SUMMARY SCORE		X

15. Identification and Analysis of Mitigation Actions: National Flood Insurance Program (NFIP) Compliance

Requirement: §201.6(c)(3)(ii): *[The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new** or updated plan describe the jurisdiction (s) participation in the NFIP?	p. 5-23	The City does not participate in the NFIP.		X
B. Does the mitigation strategy identify, analyze and prioritize actions related to continued compliance with the NFIP?	N/A			N/A
		SUMMARY SCORE		X

16. Implementation of Mitigation Actions

Requirement: §201.6(c)(3)(iii): *[The mitigation strategy section **shall** include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization **shall** include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new** or updated mitigation strategy include how the actions are **prioritized**? (For example, is there a discussion of the process and criteria used?)	pp. 7-5 to 7-6	A prioritization process is provided.		X
B. Does the **new** or updated mitigation strategy address how the actions will be implemented and administered, including the responsible department, existing and potential resources and the timeframe to complete each action?	pp. 7-7 to 7-11	Each action has the prioritization, responsible department, potential funding, timeframe, and benefit-costs/technical feasibility provided.		X
C. Does the **new** or updated prioritization process include an emphasis on the use of a **cost-benefit review** to maximize benefits?	p. 7-6 Appendix D	An emphasis on the use of a cost-benefit review is included.		X
D. Does the **updated** plan identify the completed, deleted or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (*i.e.*, deferred), does the updated plan describe why no changes occurred?	N/A			N/A
		SUMMARY SCORE		X

17. Multi-Jurisdictional Mitigation Actions

Requirement §201.6(c)(3)(iv): *For multi-jurisdictional plans, there **must** be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A Does the **new** or updated plan include identifiable **action items** for each jurisdiction requesting FEMA approval of the plan?	N/A			N/A
B. Does the **updated** plan identify the completed, deleted or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (*i.e.*, deferred), does the updated plan describe why no changes occurred?	N/A			N/A
		SUMMARY SCORE		N/A

PLAN MAINTENANCE PROCESS

18. Monitoring, Evaluating, and Updating the Plan

Requirement §201.6(c)(4)(i): *[The plan maintenance process **shall** include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new** or updated plan describe the method and schedule for **monitoring** the plan, including the responsible department?	pp. 8-1 to 8-2	An annual review will take place.		X
B. Does the **new** or updated plan describe the method and schedule for **evaluating** the plan, including how, when and by whom (*i.e.* the responsible department)?	pp. 8-1 to 8-2	The method and schedule for evaluating the plan is described.		X
C. Does the **new** or updated plan describe the method and schedule for **updating** the plan within the five-year cycle?	p. 8-2	The method and schedule for updating the plan is described.		X
		SUMMARY SCORE		X

19. Incorporation into Existing Planning Mechanisms

Requirement §201.6(c)(4)(ii): *[The plan **shall** include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new** or updated plan identify other local planning mechanisms available for incorporating the mitigation requirements of the mitigation plan?	p. 8-3	Local planning mechanisms are identified.		X
B. Does the **new** or updated plan include a process by which the local government will incorporate the mitigation strategy and other information contained in the plan (*e.g.*, risk assessment) into other planning mechanisms, when appropriate?	p. 8-3	Local planning processes are included.		X
C. Does the **updated** plan explain how the local government incorporated the mitigation strategy and other information contained in the plan (*e.g.*, risk assessment) into other planning mechanisms, when appropriate?	N/A			N/A
		SUMMARY SCORE		X

20. Continued Public Involvement

Requirement §201.6(c)(4)(iii): *[The plan maintenance process **shall** include a] discussion on how the community will continue public participation in the plan maintenance process.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new** or updated plan explain how **continued public participation** will be obtained? (For example, will there be public notices, an on-going mitigation plan committee, or annual review meetings with stakeholders?)	p. 8-9 to 8-10	Continued public participation is explained.		X
		SUMMARY SCORE		X

END OF REVIEW

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Appendix B
Adoption Resolution

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CITY OF HUSLIA

58 DAKLI STREET, P.O. BOX 10, HUSLIA, ALASKA 99746

RESOLUTION 2010-01

A RESOLUTION OF ADOPTION FOR THE CITY OF HUSLIA, ALASKA HAZARD MITIGATION PLAN.

WHEREAS, the City of Huslia is vulnerable to damages from natural hazard events which pose a threat to Public health safety and could result in property loss and economic hardship;

WHEREAS, a Hazard Mitigation Plan (the Plan) has been developed through the work of the City of Huslia Planning Team interested parties within the City of Huslia;

WHEREAS, the Plan recommends hazard mitigation actions that will protect people and property Affected by natural hazards in the City of Huslia, that will reduce future public, private, Community, and personal costs of disaster response and recovery that will reinforce the City of Huslia's leadership in emergency preparedness efforts;

WHEREAS, the Disaster Mitigation Act of 2000 (P.L. 106-390) (DMA 2000) and associated Federal Regulations published under CFR Part 201 require the City of Huslia to formally adopt a Hazard Mitigation Plan subject to the approval of the Federal Emergency Management Agency to be eligible for federal hazard mitigation projects and activities funds;

WHEREAS, public meetings were held to receive comment on the Plan as required by DMA 2000;

NOW THEREFORE BE IT RESOLVED by the Huslia City Council of the City of Huslia that:

1. The Plan is hereby adopted as an official plan of the City of Huslia.
2. The City of Huslia official identified in the Mitigation Action Plan (Section 8) are hereby directed to implement the recommended actions assigned to them. These officials will report quarterly on their activities, accomplishments, and progress of the Huslia City Council.
3. The City of Huslia's Hazard Mitigation Planning Team will provide annual progress reports on the status of the implemented Mitigation Action Plan's project to the Planning Team Leader. This report shall be submitted to the Huslia City Council annually by the adoption anniversary date.
4. The City of Huslia's Planning Team will complete periodic updates of the Plan as indicated in the Plan Maintenance (Section 8), but no less frequently than every five years.

NOW THEREFORE BE IT RESOLVED by the Huslia City Council that the City of Huslia adopts the City of Huslia **Hazard Mitigation Plan,** dated 5th day February ,2010 as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

DATED THIS 5th **DAY OF FEBRUARY, 2010**

Mayor's Signature

ATTEST:

City Administrator's signature

Appendix C
Public Outreach

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CITY OF HUSLIA HAZARD MITIGATION PLAN

February 2009

This newsletter discusses the preparation of the Huslia Hazard Mitigation Plan. It has been prepared to inform interested agencies, stakeholders, and the public about the project and to solicit comments. This newsletter can also be viewed on the State of Alaska Division of Homeland Security and Emergency Management Website at http://www.ak-prepared.com.

The State of Alaska, Department of Military and Veterans Affairs, Division of Homeland Security and Emergency Management (DHS&EM) was awarded a Pre-Disaster Mitigation Program grant from the Federal Emergency Management Agency (FEMA) to prepare Hazard Mitigation Plans (HMP) for eleven Alaskan Communities. Huslia was selected for participation in this effort.

Alaska Division of Community & Regional Affairs (DCRA) is collaborating with DHS&EM and the Interior Regional Housing Authority for preparing community profile maps as part of the hazard mitigation planning process. Examples of the maps can be viewed online at http://www.commerce.state.ak.us/dca/profiles/profile-maps.htm.

DCRA is working with DHS&EM, and their contractor URS Corporation, to share information and coordinate map preparation and hazard mitigation plan development efforts. Work on the maps is expected to begin in Spring 2009.

The Huslia Hazard Mitigation Plan will identify all natural hazards, such as flood, earthquake, erosion, wildland fire, weather related hazards and others. The plan will also identify the people and facilities potentially at risk and ways to mitigate damage from hazards. The public participation and planning process will be documented as part of the project.

What is Hazard Mitigation?

Across the United States, natural and human-caused disasters have increasingly caused injury, death, property damage, and interruption of business and government services. The toll on individuals, families, and businesses can be very high. The time, money, and emotional effort required to respond to and recover from these disasters take public resources and attention away from other important programs and problems.

The people and property in the State of Alaska are at risk from a variety of natural hazards that can potentially cause human injury, property damage, or environmental harm.

Hazard mitigation projects eliminate the risk or reduce the severity of hazards on people and property. Projects may include short- or long-term activities to reduce exposure to or the effects of known hazards. Hazard mitigation activities include relocating or elevating buildings, developing, implementing, or enforcing building codes, and education.

Why Do We Need A Hazard Mitigation Plan?

Communities must have a State, FEMA approved, and community adopted mitigation plan to receive a project grant from either the Hazard Mitigation Assistance or disaster mitigation assistance programs. The City of Huslia plans to apply for mitigation funds after our plan is complete.

The rules have changed. The Local government and Flood Hazard Mitigation Plans' requirements were consolidated into one planning mechanism. Additionally the Flood Mitigation Assistance (FMA), Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss (SRL) programs were also consolidated with the Pre-Disaster Mitigation Grant Program under the newly developed Hazard Mitigation Assistance (HMA) program. Each of these programs must use the same application process and eligibility requirements for nationally competitive funding.

The Hazard Mitigation Grant Program (HMGP) is a disaster related assistance program. Applicants typically compete on a statewide basis.

The Planning Process

There are very specific federal requirements that must be met when preparing a Hazard Mitigation Plan. These requirements are commonly referred to as the Disaster Mitigation Act of 2000, or DMA2000. Information about the requirements may be found on the Internet at: http://www.fema.gov/plan/mitplanning/index.shtm#2 under Laws, Regulations, and Guidance.

The DMA2000 requires the plan to document the following topics:

- Planning process
- Hazard identification
- Risk assessment
- Mitigation Strategy: Goals, actions, and projects
- A plan adoption resolution from the community
- State and FEMA approval

FEMA has prepared Planning Guidance and "How to" Guides that explain in detail how each of the DMA2000 requirements are met. These guides are available at http://www.fema.gov/plan/mitplanning/planning_resources.shtm#0. The Huslia Hazard Mitigation Plan will be prepared following those guidelines.

We are currently in the very beginning stages of preparing the plan. We will be conducting a public meeting to introduce the project and planning team, and to gather comments from our community residents. Specifically we will complete the hazard identification task, and collect data to conduct the risk assessment.

Our community is located in the Yukon-Koyukuk Census Area, and DHS&EM has previously identified natural hazards that occur in this area that may also occur specifically in Huslia.

The Planning Team

The planning team is being lead by Mayor Speedy Sam, Elsie Vent, Helen Huffman, Lorraine Pavlick, and Irene Peters. URS Corporation has been contracted by DHS&EM to provide assistance and guidance to the planning team throughout the planning process.

Public Participation

PUBLIC MEETINGS – Project Presentation & Data Gathering	
Location	
Date	
Time	
Toll Free call-In number:	

Public involvement will continue throughout the project. The goal is to receive comments, identify key issues or concerns, and improve ideas for mitigation. When the Draft Huslia Hazard Mitigation Plan is complete, the results will be presented to the community before DHS&EM and FEMA approval, and community adoption.

We Need Your Help

Please use the following table to identify any hazards you have observed in Huslia that DHS&EM is not aware of AND any additional natural hazards that may not be on the list.

Huslia Hazard Worksheet		
Hazard	Yukon-Koyukuk Census Area*	Huslia
Avalanche (Snow)	N	
Earthquake	Y	
Erosion (Riverine)	Y	
Drought	Y	
Flood	Y	
Landslide	N	
Permafrost	Y	
Tsunami & Seiche	N	
Volcano	N	
Weather	Y	
Wildland Fire	Y	
**Hazard Matrix from the State of Alaska Hazard Mitigation Plan for the Yukon-Koyukuk Census Area (Key: Yes, No, or Unknown)*		

DHS&EM identified critical facilities within Huslia as part of the Alaska Critical Facilities Inventory, but the list of critical facilities needs to be updated and the estimated value and location (lat/lon) determined. In addition, the number and value of structures, and the number of people living in each structure will need to be documented. Once this information is collected we will determine which critical facilities, residences, and populations are vulnerable to specific hazards in Huslia. Please add additional facilities if needed.

Huslia Critical Facilities	
Facility Type	Facility Name
Airport	
Cemetery	
Church	1
Church	2
Church	3
Community Hall	City Hall
Community Storage Shed	Equipment Storage Shed
Fire Station	
Fuel Storage Tanks (>500gal)	Bulk Fuel Facility
Hospital/Clinic/ER	Huslia Health Clinic
Landfill/Incinerator	
Offices	City Offices
Oil or Natural Gas Pipeline-End	Distribution Line to Barge Landing
Oil or Natural Gas Pipeline-Start	Distribution Line to Barge Landing
Police Station (VPSO)	VPSO Office at City Hall
Post Office	
Potable Water Production and Treatment Facility	Water Treatment Plant/Washeteria
Power Generation Facility	
Reservoir/Water Supply	Huslia PWS
Satellite	ARCS
School	
Senior Center	Elders Building
Sewage Lagoon	
Store	
Teachers Quarters	
Telephone	Public Phone at City Offices
Washeteria	Water Treatment Plant Washeteria
**AK Critical Facilities Inventory*	

Please email or fax updated hazard and critical facility information directly to URS or provide it to your community planning team leader

We encourage you to take an active part in preparing the Huslia Hazard Mitigation Plan and the DCCED Community Mapping effort. The purpose of this newsletter is to keep you informed and to allow you every opportunity to voice your opinion regarding these important projects. Please contact your community representative, URS planning coordinators, or the DCCED community mapping manager if you have any questions, comments, or requests for more information:

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CITY OF HUSLIA HAZARD MITIGATION PLAN

August 2009 Newsletter 2

This newsletter discusses the preparation of the City of Huslia Hazard Mitigation Plan. It has been prepared to inform interested agencies, stakeholders, and the public about the project and to solicit comments. This newsletter can also be viewed on the State of Alaska Division of Homeland Security and Emergency Management Website at http://www.ready.alaska.gov.

The City of Huslia was one of eleven communities selected by the State of Alaska, Division of Homeland Security and Emergency Management (DHS&EM) for a Hazard Mitigation Planning development project. The plan identifies natural hazards that affect the community including earthquake, erosion, drought, flood, permafrost, severe weather, and wildland fire. The plan also identifies the people and facilities potentially at risk and ways to mitigate hazards. The public participation and planning process has been documented as part of the project. URS Corporation (URS) was hired as consultants to assist in preparing the plan.

What is Hazard Mitigation?

Across the United States, natural disasters have increasingly caused injury, death, property damage, and business and government service interruptions. The toll on individuals, families, and businesses can be very high. The time, money, and emotional effort required to respond to and recover from these disasters take public resources and attention away from other important programs and problems.

The people and property in the State of Alaska are at risk from a variety of hazards that have the potential for causing human injury, property damage, or environmental harm.

The purpose of hazard mitigation is to implement projects that eliminate the risk or reduce the severity of hazards on people and property. Mitigation programs may include short-term and long-term activities to reduce the hazards, reduce exposure to hazards, or reduce the effects of hazards. Mitigation could include education, and construction projects. Hazard mitigation activity examples include relocating buildings, developing or strengthening building codes, and educating residents and building owners.

Why Do We Need A Hazard Mitigation Plan?

A community is only eligible to receive grant money for mitigation programs by preparing and adopting a hazard mitigation plan. Communities must have an approved mitigation plan to receive grant funding from the Federal Emergency Management Agency (FEMA) for eligible mitigation projects. The City of Huslia plans to apply for grant funding after the plan is approved by DHS&EM and FEMA and adopted by the City.

The Planning Process

There are very specific federal requirements that must be met when preparing a hazard mitigation plan. These requirements are commonly referred to as the Disaster Mitigation Act of 2000, or DMA2000 criteria. Information about the criteria may be found on the Internet at: http://www.fema.gov/plan/mitplanning/guidance.shtm.

The DMA2000 requires the plan to document the following topics:

- Planning process
- Hazard identification
- Risk assessment
- Goals
- Mitigation programs, actions, and projects
- A resolution from the community adopting the plan

FEMA has prepared Planning Guidance which is available at: http://www.fema.gov/library/viewRecord.do?id=3336; and "How to" Guides that explain in detail how each of the DMA2000 requirements is met. These guides are available at http://www.fema.gov/plan/mitplanning/resources.shtm. The Allakaket Hazard Mitigation Plan will follow those guidelines.

In January 2008 the planning process kicked-off by establishing a local planning committee and holding a public meeting. During the meeting the planning committee examined the full spectrum of hazards listed in the State Hazard Mitigation Plan and identified seven hazards that the Huslia plan would address including earthquake, erosion, drought flood, permafrost, wildland fire, and severe weather.

After the first public meeting, City staff and URS began identifying critical facilities, compiling the hazard profiles, assessing capabilities, and conducting the risk assessment for the identified hazards. Critical facilities are facilities that are critical to the recovery of a community in the event of a disaster. After collection of this information, URS helped to determine which critical facilities and estimated populations are vulnerable to the identified hazards in Huslia.

A mitigation strategy was the next component of the plan to be developed. Understanding the community's local

capabilities and using information gathered from the public and the local planning committee and the expertise of the consultants and agency staff, a mitigation strategy was developed. The mitigation strategy is based on an evaluation of the hazards, and the assets at risk from those hazards. Goals and actions/projects were developed as the foundation of the mitigation strategy. Mitigation goals are defined as general guidelines that explain what a community wants to achieve in terms of hazard and loss prevention. Goals are positively stated future situations that are typically long-range, policy-oriented statements representing community-wide visions. Mitigation actions/projects are undertaken in order to achieve your stated objectives. In June 2009, the local planning committee identified projects/actions for each hazard that focus on six categories: prevention, property protection, public education and awareness, natural resource protection, emergency services, and structural projects. The mitigation actions identified as a high priority by the planning team are listed below, and explained in more detail in the plan.

The selected projects/actions will be implemented over the next five years. A maintenance plan has also been developed for the hazard mitigation plan. It outlines how the community will monitor progress on achievement of the projects/actions that will help meet the stated goals and objectives, as well as an outline for continued public involvement.

The draft plan is available in the City office and on the State website (http://www.ready.alaska.gov) for public review and comment. Comments should be made via email, fax, or phone to the contact person below and be received no later than July 24, 2009. The plan will be provided to DHS&EM and FEMA for their approval prior to formal adoption by the Huslia City Council.

The Planning Committee

The plan was developed with the assistance from a Planning Team consisting of a cross section of the community. Planning Team members who helped develop the plan include Mayor Speedy Sam, Team Leader Elsie Vent, Lorraine Pavlick, Irene Peters, Jeanette Vent, and Harold Vent, URS Corporation and DHS&EM are also providing assistance to the Planning Team.

Sample of the City of Huslia's Mitigation Actions. Review the draft HMP for a complete list.		
Hold a "hazard meeting" for residents about recognition and mitigation of hazards that affect the City of Huslia.	Develop pubic outreach program to train earthquake safety and perform drop-cover-hold drills at schools and public facilities.	Join the NFIP, which provides federally backed insurance to individuals who live in communities that have joined the program.
Identify and pursue funding opportunities to implement mitigation actions.	Relocate buildings that are at risk of being affected by erosion.	Adopt and enforce floodplain management ordinances.
Review existing community plans and incorporate mitigation philosophy from this plan into appropriate sections of other community plans.	Apply for grants/funds to implement riverbank erosion protection methods.	Acquire (buy-out), relocate, elevate, or otherwise flood-proof identified critical facilities and private properties.
Identify potential or funded community or outside agency projects (ANTHC, DCCED, AKDOT, and HUD etc.) designed to mitigate hazards identified within this HMP.	Develop education outreach program concerning stream bank and hillside stabilization bioengineering process using plants and other vegetative materials	Map existing permafrost areas to assist in critical facility relocation siting
Acquire (buy-out), demolish, or relocate structures from hazard prone areas.	Install embankment protection such as vegetation, riprap, gabion baskets, sheet piling, and walls to reduce or eliminate erosion.	Develop outreach program to educate and encourage fire-safe construction practices for existing and new construction in high risk areas.
Purchase and install generators with main power distribution disconnect switches for identified and prioritized critical facilities susceptible to short term power disruption.	Develop and maintain severe winter storm public education and outreach program defining mitigation activity benefits aimed at households and businesses while targeting special needs populations.	

We encourage you to learn more about the City of Huslia's Hazard Mitigation Plan. The purpose of this newsletter is to keep you informed and to allow you every opportunity to voice your opinion regarding this important project. If you have any questions, comments, or requests for more information, please contact:

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Appendix D

Benefit–Cost Analysis Fact Sheet

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Benefit-Cost Analysis Fact Sheet

Hazard mitigation projects are specifically aimed at reducing or eliminating future damages. Although hazard mitigation projects may sometimes be implemented in conjunction with the repair of damages from a declared disaster, the focus of hazard mitigation projects is on strengthening, elevating, relocating, or otherwise improving buildings, infrastructure, or other facilities to enhance their ability to withstand the damaging impacts of future disasters. In some cases, hazard mitigation projects may also include training or public-education programs if such programs can be demonstrated to reduce future expected damages.

A Benefit-Cost Analysis (BCA) provides an estimate of the "benefits" and "costs" of a proposed hazard mitigation project. The benefits considered are avoided future damages and losses that are expected to accrue as a result of the mitigation project. In other words, benefits are the reduction in expected future damages and losses (i.e., the difference in expected future damages before and after the mitigation project). The costs considered are those necessary to implement the specific mitigation project under evaluation. Costs are generally well determined for specific projects for which engineering design studies have been completed. Benefits, however, must be estimated probabilistically because they depend on the improved performance of the building or facility in future hazard events, the timing and severity of which must be estimated probabilistically.

All Benefit-Costs must be:

- Credible and well documented
- Prepared in accordance with accepted BCA practices
- Cost-effective (BCR $\geq$ 1.0)

General Data Requirements:

- All data entries (other than Federal Emergency Management Agency [FEMA] standard or default values) MUST be documented in the application.
- Data MUST be from a credible source.
- Provide complete copies of reports and engineering analyses.
- Detailed cost estimate.
- Identify the hazard (flood, wind, seismic, etc.).
- Discuss how the proposed measure will mitigate against future damages.
- Document the Project Useful Life.
- Document the proposed Level of Protection.
- The Very Limited Data (VLD) BCA module cannot be used to support cost-effectiveness (screening purposes only).
- Alternative BCA software MUST be approved in writing by FEMA HQ and the Region prior to submittal of the application.

Damage and Benefit Data

- Well documented for each damage event.
- Include estimated frequency and method of determination per damage event.
- Data used in place of FEMA standard or default values MUST be documented and justified.

- The Level of Protection MUST be documented and readily apparent.
- When using the Limited Data (LD) BCA module, users cannot extrapolate data for higher frequency events for unknown lower frequency events.

Building Data

- Should include FEMA Elevation Certificates for elevation projects or projects using First Floor Elevations (FFEs).
- Include data for building type (tax records or photos).
- Contents claims that exceed 30 percent of building replacement value (BRV) MUST be fully documented.
- Method for determining BRVs MUST be documented. BRVs based on tax records MUST include the multiplier from the County Tax Assessor.
- Identify the amount of damage that will result in demolition of the structure (FEMA standard is 50 percent of pre-damage structure value).
- Include the site location (i.e., miles inland) for the Hurricane module.

Use Correct Occupancy Data

- Design occupancy for Hurricane shelter portion of Tornado module.
- Average occupancy per hour for the Tornado shelter portion of the Tornado module.
- Average occupancy for Seismic modules.

Questions to Be Answered

- Has the level of risk been identified?
- Are all hazards identified?
- Is the BCA fully documented and accompanied by technical support data?
- Will residual risk occur after the mitigation project is implemented?

Common Shortcomings

- Incomplete documentation.
- Inconsistencies among data in the application, BCA module runs, and the technical support data.
- Lack of technical support data.
- Lack of a detailed cost estimate.
- Use of discount rate other than FEMA-required amount of 7 percent.
- Overriding FEMA default values without providing documentation and justification.
- Lack of information on building type, size, number of stories, and value.
- Lack of documentation and credibility for FFEs.
- Use of incorrect Project Useful Life (not every mitigation measure = 100 years).

Appendix E

Plan Maintenance Documents

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Annual Review Questionnaire

PLAN SECTION	QUESTIONS	YES	NO	COMMENTS
PLANNING PROCESS	Are there internal or external organizations and agencies that have been invaluable to the planning process or to mitigation action			
	Are there procedures (e.g., meeting announcements, plan updates) that can be done more efficiently?			
	Has the Task Force undertaken any public outreach activities regarding the MHMP or implementation of mitigation actions?			
HAZARD PROFILES	Has a natural and/or human-caused disaster occurred in this reporting period?			
	Are there natural and/or human-caused hazards that have not been addressed in this HMP and should be?			
	Are additional maps or new hazard studies available? If so, what have they revealed?			
VULNERABILITY ANALYSIS	Do any new critical facilities or infrastructure need to be added to the asset lists?			
	Have there been changes in development patterns that could influence the effects of hazards or create additional risks?			
MITIGATION STRATEGY	Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning within the			
	Are the goals still applicable?			
	Should new mitigation actions be added to the a community's Mitigation Action Plan?			
	Do existing mitigation actions listed in a community's Mitigation Action Plan need to be reprioritized?			
	Are the mitigation actions listed in a community's Mitigation Action Plan appropriate for available resources?			

Mitigation Action Progress Report

Progress Report Period: _____ to _____
(date) (date)

Project Title: _____ Project ID# _____

Responsible Agency: _____

Address: _____

City: _____

Contact Person: _____ Title: _____

Phone #(s): _____ email address: _____

List Supporting Agencies and Contacts:

_____

_____

Total Project Cost: _____

Anticipated Cost Overrun/Underrun: _____

Date of Project Approval: _____ Start date of the project: _____

Anticipated completion date: _____

Description of the Project (include a description of each phase, if applicable, and the time frame for completing each phase): _____

_____

_____

_____

Milestones	Complete	Projected Date of Completion

Plan Goal (s) Addressed:

Goal: _____

Indicator of Success: _____

Project Status

- [ ] Project on schedule
- [ ] Project completed
- [ ] Project delayed*

*explain: _____

- [ ] Project canceled

Project Cost Status

- [ ] Cost unchanged
- [ ] Cost overrun*

*explain: _____

- [ ] Cost underrun*

*explain: _____

Summary of progress on project for this report:

A. What was accomplished during this reporting period?

B. What obstacles, problems, or delays did you encounter, if any?

C. How was each problem resolved?

Next Steps: What is/are the next step(s) to be accomplished over the next reporting period?

Other Comments: