Image courtesy of ShoreZone

Background Planning Report

Kivalina Strategic Management Plan

Kivalina, Alaska

July 17, 2015

DRAFT

Strategic Management Plan: Background Report

DRAFT issued for review by the Native Village of Kivalina and the Kivalina Interagency Working Group.
Prepared by HDR with RIM First People for the State of Alaska
Department of Commerce, Community, and Economic Development
Division of Community and Regional Affairs

This report is funded with qualified outer continental shelf oil and gas revenues by the Coastal Impact Assistance Program, U.S. Department of the Interior, U.S. Fish and Wildlife Service.

DCCED Project Manager:
Sally Russell Cox, Planner
Division of Community and Regional Affairs

Community Coordinator:
Dollie Hawley, Native Village of Kivalina

Editorial contributions from:
To be completed later

With special acknowledgement to the residents of Kivalina and the community leadership.

Native Village of Kivalina Council

Millie Hawley, President
Isabelle Booth
Daniel Foster
Dolly Foster
Rebecca Norton
Richard Sage
Stanley Hawley, Administrator

City Council

Austin Swan, Sr., Mayor
Alice Adams
Colleen E. Swan
Ida N. Swan
Leroy T. Adams
Lucy Adams
Janet Mitchell, City Administrator

Although Kivalina residents continue to debate the location of a future village site, they speak with one voice when it comes to the need and desire for improving community health.

SOURCE: ANTHC 2011

Table of Contents

List of Figures

List of Tables

Abbreviations

ACS	American Community Survey
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish & Game
ATV	All-Terrain Vehicle
AVEC	Alaska Village Electric Cooperative
DCCED	Department of Commerce, Community, and Economic Development
DOT&PF	Alaska Department of Transportation and Public Facilities
DPS	Distinct Population Segment
ESA	Endangered Species Act
IRA	Indian Reorganization Act
MBTA	Migratory Bird Treaty Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
SMP	Strategic Management Plan
USACE	U.S. Army Corps of Engineers
USFWS	US Fish and Wildlife Service

1 Introduction

Kivalina is a traditional Iñupiaq community located in the Northwest Arctic Borough of Alaska. The community is located on a barrier island off the Chukchi Sea, 83 miles north of the Arctic Circle. Historically, the marine waters around Kivalina have been ice-free from early July through late October, but later freeze-up and earlier melting has resulted in longer ice-free periods during recent years. This has left Kivalina facing significant risks from storms, such as flooding and erosion.

This barrier island has long been subject to the processes of accretion and erosion. Residents of the community have expressed concerns about storm surges and erosion for decades. The longer ice-free period that has resulted from the changing climate makes the village vulnerable to dangerous fall storms. Storm events in 2004 and 2005 eroded the Chukchi Sea shoreline, threatening critical infrastructure and facilities, including the community fuel tank farm, school, and airstrip. Chronic erosion on the lagoon side of the island has threatened homes, while on the seaside of the island, fall storm surges create annual coastal flooding and beach erosion.

It has long been apparent that the island will eventually succumb to natural forces and that the village will have to be moved. Extensive studies have been undertaken, alternative village sites have been identified, and cost estimates have been prepared.

Kivalina faces some considerable challenges as it charts its future course. While many people wish to relocate the community, little progress has been made since the since the first community election on relocation was held more than 50 years ago. The current emphasis is on developing an evacuation road so residents have a safe place of refuge to use in case of an emergency while they determine their long-term future.

The *Kivalina Strategic Management Plan* (SMP) is an 18-month project with the Alaska Department of Commerce, Community, and Economic Development (ADCCED) and the community of Kivalina. The objective of the project is to increase community sustainability and resilience to the impacts of natural hazards while protecting the natural coastal environment. The project is based on the premise that careful planning, agency collaboration and strong community leadership are essential to successfully addressing the needs of imperiled communities. The process is shown in Figure 1.

This *Background Planning Report* is the first product of an 18-month Alaska Community Coastal Protection Project with the DCCED and the community of Kivalina to make Kivalina more resilient. The objective of the project is to increase community resilience and sustainability to the impacts of natural hazards threatening these communities while protecting the natural coastal environment. The project is based on the premise that careful planning, agency collaboration and strong community leadership are essential to successfully addressing the needs of imperiled communities. The process is shown in Figure 1.

This *Background Planning Report* includes:

- Community Background
- Reasons for Developing a Strategic Management Plan
- Summary of Previous Projects
- Summary of Environmental Considerations
- Identification of Issues
- Mission Statement and Guiding Principles
- Goals and Objectives
- Next Steps

Photo courtesy: Millie Hawlie

The second product will be a *Strategic Management Plan* (SMP) for Kivalina that will provide the "blueprint" for how the community and agencies will proceed over the next 20 years to accomplish the recommended actions the community has decided to take. The process used to develop the *Background Planning Report* and *Strategic Management Plan* is shown in Figure 1.

Figure 1. Planning Process

There is no universal definition of resilience. The term "resilience" has emerged from the field of ecology. It describes the capacity of a system to maintain or recover functionality after a disruption or disturbance. For the purposes of the SMP, the following definition is used (DCCED 2012).

> Resilience is the capability to anticipate risk, limit impact, and bounce back rapidly through survival, adaptability, evolution, and growth in the face of turbulent change. A resilient community is not only prepared to help prevent or minimize the loss or damage to life, property and the environment, but also it has the ability to "bounce back", i.e. quickly return citizens to work, reopen businesses, and restore other essential services needed for a full and swift economic recovery.

Creating a resilient community is not following a series of defined action items; rather it requires developing a new way of approaching issues. It requires engaging a diverse range of stakeholders, integrating the planning process across disciplines and levels of government, and coordinating available funding with resilience needs (see Figure 2).

Figure 2. Resiliency Relationships

2 Community Background

2.1 Location

Kivalina is located at the tip of an 8-mile barrier reef between the Chukchi Sea and Kivalina Lagoon within the Northwest Arctic Borough. It is approximately 80 miles northwest of Kotzebue, 520 miles northwest of Fairbanks, 360 miles southwest of Barrow, and 83 miles north of the Arctic Circle (see Figure 3).

Figure 3. Location and Vicinity Map

2.2 Access

Kivalina is not connected to any road systems, and the basic modes of transportation to and from Kivalina are plane, small boat, and snowmachine. The State owns a gravel airstrip, and there is regular air service from Kotzebue and Point Hope. Northland Services barges fuel, automobiles, groceries, household goods, and general supplies to Kivalina in July and August.

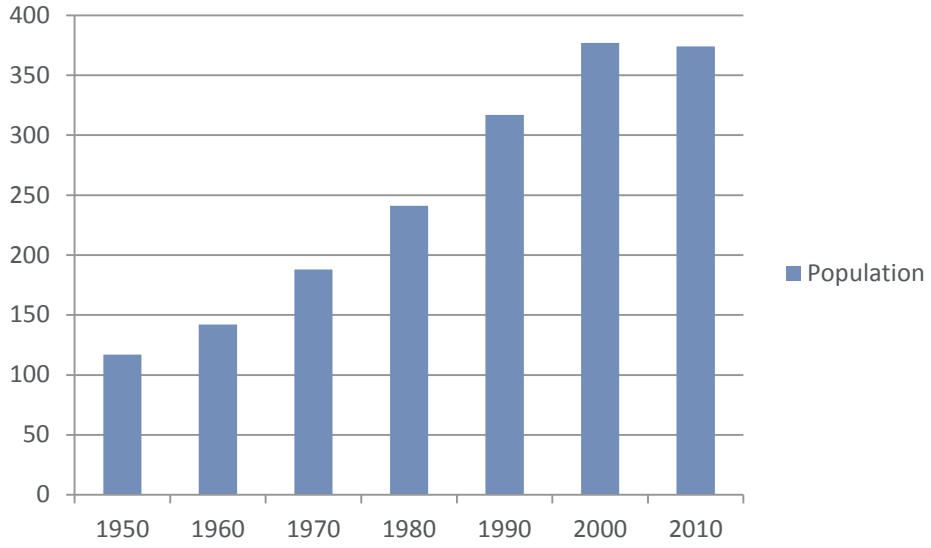
2.3 Government

The City of Kivalina was incorporated in 1969 as a 2nd Class City. The community has a "strong mayor" form of government. Under Alaska Statute Title 29, the City of Kivalina assumes powers, including the ability to tax and to administer transportation, police, fire protection, and various other services. The City Council has seven members that meet the second Tuesday of every month. Regular elections are held on the first Tuesday in October. The city imposes a 2 percent sales tax.

2.4 Population and Economy

According to the 2010 Census, Kivalina has a population of 374 residents, which is 3 fewer than the 2000 Census population (U.S. Census Bureau 2000, 2010; see Figure 4). According to the 2010 U.S. Census, approximately 96 percent of residents are all or part Alaska Native.

Figure 4. Historical Population, 1950-2010



The people of Kivalina depend primarily on traditional subsistence practices, combined with a modern wage economy. The local subsistence economy depends largely on subsistence practices such as harvesting marine mammals, fish, waterfowl, caribou, and other wildlife, in addition to local vegetation, for food. Employment opportunities are limited, but some opportunities exist with the City, Village Council, McQueen School, Maniilaq Association, local stores, and Red Dog Mine. The Native craft industry is expanding and adding to the economy of the community.

In 2013, 167 residents were employed, two residents held commercial fishing permits, and there were 88 unemployment insurance claimants. According to the 2009-2013 ACS 5-year estimate, 27.7 percent of residents are below the poverty line (U.S. Census Bureau 2013). The per capita income is $14,185, with a median household income of $59,167.

Subsistence hunting is the village's primary source of meat. Subsistence foods harvested include seal, walrus, whale, salmon, whitefish, and caribou. Kivalina is one of 10 whaling communities in the Alaska Eskimo Whaling Commission. In accordance with International Whaling Commission rules, Alaska Native whalers can legally hunt an allocated number of bowhead whales each year for food, oil, and Native craft materials.

2.5 Infrastructure – Housing, Utilities, and Services

The community has a total of 99 housing units, and 85 of those units are occupied. A total of 14 housing units are vacant, four of which are vacant due to seasonal use. Sixty-four are owner-occupied and 21 are renter-occupied.

Currently, public facilities in Kivalina include the McQueen School, two churches, recreation center, U.S. Post Office, community hall, and village health clinic operated by Maniilaq Association.

Kivalina has a volunteer fire department. There is currently no Village Public Safety Officer assigned to the community, and law enforcement is through the Alaska State Trooper post in Kotzebue.

Potable water is transported from the Wulik River through a surface line during the summer, and then treated and stored in community water tanks. Water transmission lines bring water to the school and washateria. Residents obtain water by hauling it from a watering point at the water plant and then transporting it by all-terrain vehicle (ATV) to their home. About one-third of the homes in the community have storage tanks that provide running water. In the remainder of homes, water is dipped from 30-gallon plastic garbage cans typically kept in the living room or arctic entry. The school, teachers' housing, and clinic have individual water systems.

Kivalina flooding in the past 10 years caused the Wulik River's drinking water to have a different or bad taste and I think the rivers getting too dirty and part of the river banks are falling do to erosion. During the years of living in Kivalina, the house I live in keeps shifting or moving to have wind drafts and lowered foundation.

SOURCE: Community Resident, Community Background Survey

There is no water-flushed sewage system in Kivalina other than at the school, teachers' housing, and the clinic. Homes and facilities typically use 5-gallon waste pails known as "honey buckets." The community has four waste-bucket collection points for human waste. Residents dispose of their non-septic wastewater (grey water) outside of their houses.

The lack of adequate sanitation is the most immediate health threat in Kivalina.

SOURCE: ANTHC 2011

The landfill is a Class III unpermitted landfill, located approximately 1 mile northwest of the community. Access to the landfill requires crossing the length of the airport property, as it is located a few hundred yards beyond the north of the end of the runway. The close proximity of the landfill to the runway is a Federal Aviation Administration violation, which has raised serious safety concerns due to bird interference with aircraft.

The Alaska Village Electric Cooperative (AVEC) provides electricity with diesel-powered generators. Telephone and internet services are provided by OTZ Telephone Cooperative and GCI.

2.6 Climate

Kivalina lies in the transitional climate zone, which is characterized by long, cold winters and cool summers. The average low temperature during January is -15° Fahrenheit (°F); the average high temperature during July is 57°F. Temperature extremes have been measured from - 54° to 85°F. Snowfall averages 57 inches, with 8.6 inches of precipitation per year. The Chukchi Sea is ice-free and open to boat traffic from mid-June to the beginning of November.

"Kivalina…is very beautifully situated when the weather is nice and calm. But when the wind blows from the south, it raises the water in the ocean until it sometimes comes over the banks, is washed out the southeast bank of the island and the natives are beginning to talk of moving."

Clinton Replogle, School Teacher, 1911

SOURCE: ANTHC 2011

3 Why Develop a Strategic Management Plan?

The reasons for producing a SMP include:

1. **Establish a Unified Vision**
   With ongoing threats to the community and the long time required to implement solutions, it is important to focus community and partner resources behind a cohesive vision.

2. **Create a Framework for Future Activities**
   The SMP will function as an overarching framework for resiliency activities. Other planning efforts, policies, strategies, and projects should fit into this framework be effective in the efforts to achieve the community's goals. The implementation of the SMP recommendations will likely be done by different project sponsors over many years. As time progresses, and individual projects evolve, it is easy for their purpose, goals, deliverables, and timelines to change. The SMP, and its future updates, will provide the touchstone to ensure all activities implement Kivalina's vision and goals.
3. **Communication**
   The SMP will document and communicate the community's vision, guiding principals, and strategic actions and will be used by the community, government entities, and other people or groups that have an interest in Kivalina. It provides a centralized reference that shares the same information with all interested parties.
4. **Relationship Building**
   It would be challenging for Kivalina to fully implement the SMP recommendations using solely its own resources. Building relationships with other organizations will help Kivalina realize its vision and goals. Potential partners will participate in the SMP development process, creating a foundation from which to build as activities progress.

4 Summary of Previous Projects

This section provides an overview of previous projects that address the risks of flooding, erosion, thawing permafrost, and severe storms. Please see the *Kivalina Situation Assessment* for additional information about previous studies.

4.1 Erosion Control Structures

There is little information about the specific mechanics of erosive forces and longshore transport of sediments at Kivalina. Consequently, efforts to protect against erosion have a history of being experimental. Sandbags were placed on the lagoon side of the island to protect against the erosive forces of the Kivalina and Wulik rivers in 1990 (Mason et al. 1998). This effort is believed to have failed because the sandbags were not placed high enough against the bank. In response to storms in 2004 and 2005, the Northwest Arctic Borough installed an emergency erosion control structure in 2006. This gabion-like structure used HESCO bags filled with sand from the area in front of the AVEC fuel tanks and placed in a wired structure. This structure did not last even one season. In 2007, another emergency response involved placement of 1-cubic-yard "super sacks" provided by the U.S. Army Corps of Engineers (USACE; see Situation Assessment, Gray 2010a).

In 2007, Congress made a special appropriation to the USACE for a 2,000-foot rock revetment project for the ocean side of the community. The revetment has a design height of 14 feet to minimize overtopping from wave setup and wave run-up. The USACE estimated that the revetment would have a lifespan of 15 years or longer if it was maintained regularly (Gray 2010a).

4.2 Evacuation Route

A 2005 study evaluated eight evacuation route alternatives and recommended a route across the lagoon to Simik, continuing inland to a gravel and rock source, at a cost of $21.3 million (ASCG 2005). A 2008 Draft Kivalina Evacuation Road Feasibility Study reviewed two routes: A bridge/road to Kiniktuuraq ($38.9 million) and a causeway/bridge across the lagoon to Simik ($20.3 million). The study recommended no further work on these routes until substantial funding is secured.

4.3 Relocation

There have been many previous studies regarding the potential relocation of Kivalina, including a 1994 DOWL Engineering report, as well as reports in 1998 and 2006 by the USACE. The community has held five elections on relocation matters. The last vote was in 2000, when most voters chose to relocate to Kiniktuuraq. The 2006 community *Master Plan* completed by the USACE, however, found that Kiniktuuraq was not a suitable relocation site because of threats from flooding and erosion and ice-rich, permafrost soils. The *Master Plan* recommended that only two sites be considered further: Tatchim Isua and Imnakuk Bluff. Both sites are located north of the current community in areas unsuitable to the community leadership because of (1) the distance from marine and river access and (2) adverse weather conditions. The 2006 *Master Plan* estimated the cost of relocation to be between $154.9 and $251.5 million (USACE 2006a), but a subsequent report estimated the relocation costs to be between $95 and $125 million (USACE 2006b).

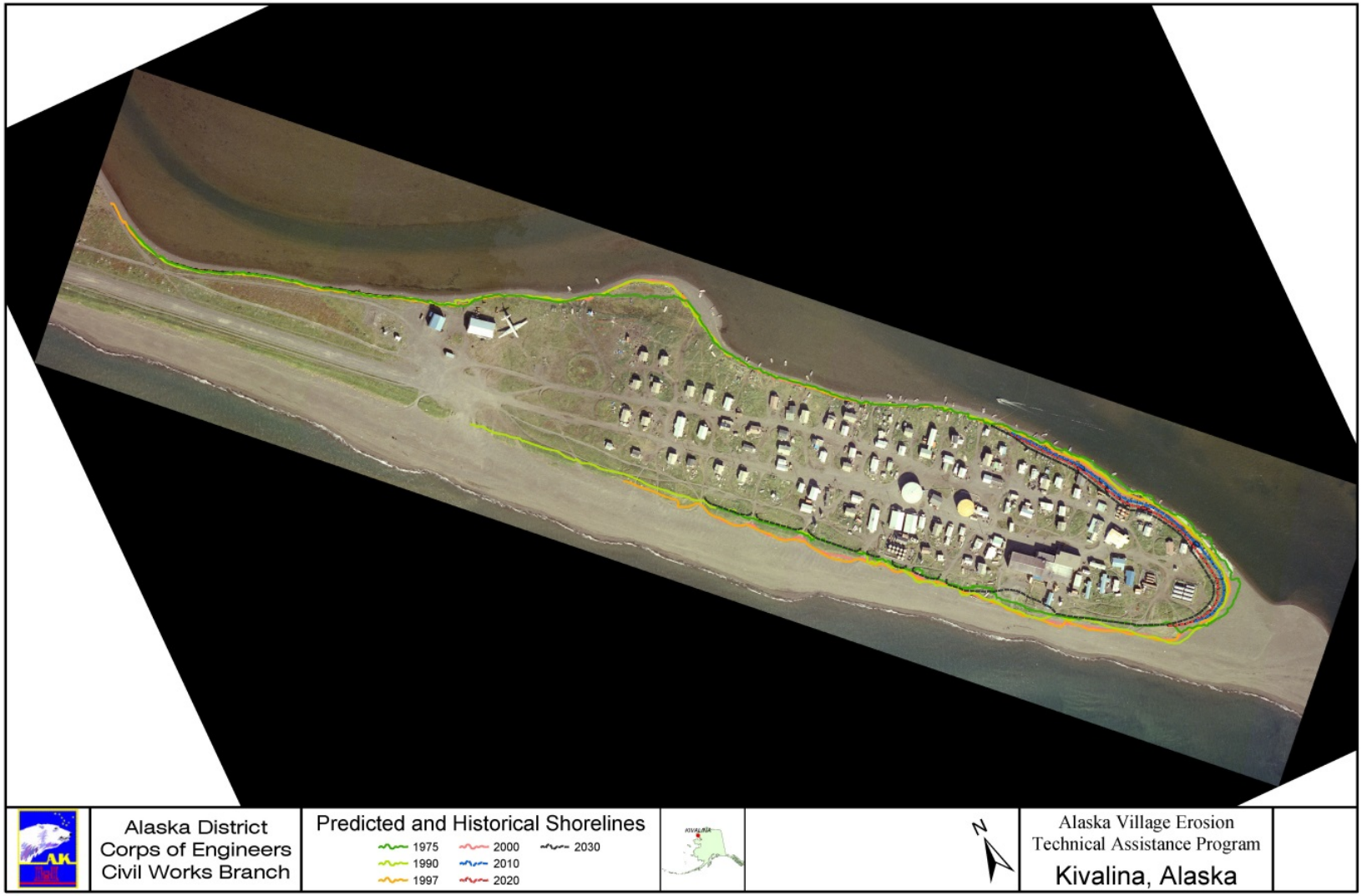
4.4 Alaska Village Erosion Technical Assistance Program

The Alaska Village Erosion Technical Assistance Program report was prepared by the USACE in 2006. This report examined erosion conditions at seven Alaska communities: Bethel, Dillingham, Kaktovik, Kivalina, Newtok, Shishmaref, and Unalakleet. For each location, the report examined the costs of ongoing erosion, the cost to relocate, and the amount of time left before erosion would destroy the community. Based on historical shoreline information, the report identified a predicted Kivalina shoreline in 2030 (see Figure 5).

Traveling this river is becoming more challenging each year. For miles, the banks are undercut on both sides, and fallen chunks of the bank line the river. The river is rapidly becoming wider, shallower, warmer, and dirtier.

SOURCE: ANTHC 2011

Figure 5. Predicted and Historical Shorelines



4.5 Kivalina Consensus Building Project

Between 2010 and 2012, Glenn Gray and Associates, in association with the City of Kivalina, worked with the community to complete the Kivalina Consensus Building Project. The purpose of the project was to explore areas of agreement that will lay the foundation for future community planning. The project involved an assessment of the risks of natural hazards to the community. It also involved a door-to-door survey of the residents, a Situation Assessment, and a final report that summarized recommendations by community leaders and residents. Detailed information about the community and risks from natural hazards can be found in the Situation Assessment (Gray 2010a).

4.6 Immediate Action Workgroup

The Immediate Action Workgroup of the Governor's Executive Sub-cabinet on Climate Change was established in 2008 to address known threats to communities caused by coastal erosion, thawing permafrost, flooding, and fires. The workgroup developed a series of policy recommendations to help create a strategic approach for addressing climate change in Alaska. The policy recommendations included:

- Establish a statewide system to document, assess, and analyze current and planned public infrastructure in order to protect existing and future investments and prevent threats to life in an uncertain environment.
- Sunset the immediate action workgroup and direct the relevant State agencies to establish an interagency collaboration with each other, along with relevant federal agencies and communities. This collaborative requires regularly scheduled meetings to coordinate information, planning, evaluation, and decisions on public infrastructure for those communities impacted by climate change phenomena.
- Assistance to communities in peril must utilize comprehensive integrated planning and viable, future-oriented solutions with funding that allows for sustainability regardless of whether the community remains in place, uses a migration strategy, or needs to relocate.
- The State of Alaska will lead a coordinating effort to develop a comprehensive statewide data collection and evaluation system that provides foundational information for community and business decisions and solutions leading to effective responses and adaptation strategies to address climate change impacts.

4.7 Other Climate-Related Planning Efforts

A number of other planning efforts that relate to climate change impacts to Kivalina are summarized in the following bullets.

- **Local Hazard Multi-Hazard Mitigation Plan:** This plan identifies local hazards facing the community (City of Kivalina, ASCG, and Bechtol 2007). Recommended mitigation projects include relocation of the sewage treatment plant, relocation of fuel lines to the school, removal of sewage bunkers on the shoreline, replacement of damaged water tank skins, lagoon erosion control project, evacuation road, structure elevation, assessment of integrity of public buildings, and installation of a siren to warn of a disaster event or severe storm.

- **Emergency Plans:** Two plans completed in 2010 address community responses to emergencies, including storm-related events: *Emergency Operations Plan* and *Evacuation Plan*.

5 Summary of Environmental Considerations

The following summary identifies known key important natural resources in Kivalina documented in previous studies and reports.

5.1 Fish and Wildlife

5.1.1 Birds and Waterfowl

According to the 2005 Draft Kivalina *Master Plan*, birds and waterfowl that can be found in the Kivalina area include:

- White-fronted geese
- Cackling and lesser Canada geese
- Black brant
- Mallards
- Common and king eiders

5.1.2 Terrestrial and Marine mammals

According to the 2005 Draft Kivalina *Master Plan*, there are approximately 21 species of terrestrial mammals and 21 species of marine mammals in the Kivalina area. Terrestrial mammals in the region include:

- Caribou
- Grizzly bear
- Musk ox
- Wolf
- Arctic fox
- Weasel
- Wolverine

Marine mammals include:

- Spotted, ribbon, ringed, and bearded seals
- Pacific walrus
- Bowhead, gray, and beluga (belukha) whales

5.1.3 Threatened and Endangered Species

Species listed under the Endangered Species Act (ESA) that may occur in the terrestrial or marine environment near Kivalina are managed by either the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS). The species managed by the USFWS include:

- Short-tailed albatross
- Polar bear
- Steller's eider
- Spectacled eider
- Pacific walrus (candidate for listing)

Short-tailed albatross are found in the Bering Sea, but are typically far from shore and would not likely be affected by erosion protection measures or a relocation project.

The species that may be found in the waters around Kivalina that are managed by NMFS include:

- Steller sea lion - Western Distinct Population Segment (DPS)
- Bowhead whale
- Fin whale
- Humpback whale
- Sperm whale
- Bearded seal - Beringia DPS
- Ringed seal, Arctic subspecies

Additionally, blue whales, North Pacific right whales, and grey whales are rare in the Bering Sea region, but may need to be evaluated depending on the extent of project effects.

Ice conditions are the most pronounced climate impact in the Chukchi Sea. Kivalina hunters have easy access to open water in winter, or to ice floes in the spring, and depend upon the sea ice as a work platform and as a pathway to their ocean hunting grounds. But warming is changing the sea ice.

SOURCE: ANTHC 2011

5.1.4 Fish

According to the 2005 Draft Kivalina *Master Plan*, the Kivalina and Wulik rivers are listed as anadromous streams in the Alaska Department of Fish and Game (ADF&G) Fish Distribution Database. The Kivalina River supports pink, chum, king, and coho salmon, as well as arctic char (Dolly Varden). The Wulik River and its tributaries support all five species of salmon (pink, chum, king, coho, and sockeye), arctic char, and whitefish species.

Coastal and inland waters support four species of whitefish important to subsistence, including the humpback whitefish, least cisco, Bering cisco, and round whitefish. Arctic cod and saffron cod appear in the Kivalina Lagoon twice a year after freeze-up and in early July. Other fish found in coastal waters include grayling, sculpin, burbot, and smelt.

5.2 Wetlands and Vegetation

According to the 2005 Draft Kivalina *Master Plan*, the area has extensive salt marsh habitat. Salt marsh wetlands (estuarine emergent wetlands) are vegetated with grasses, sedges, and broad-leaved and salt-tolerant emergent. Around the lagoon, wetland habitats include salt marshes, palustrine scrub-shrub and emergent wetlands, and open water ponds. Upland areas may include areas that are classified as wetlands, which would require placement of fill and associated permits in order to develop a new town site.

5.3 Historical and Cultural Resources

There are 23 previously documented cultural resources within 1 mile of Kivalina (NPS 2013). One site, the Cape Krusenstern Archaeological District National Monument (NOA-00042), is listed on the National Register of Historic Places (NRHP) as a National Historic Landmark. Another site, the Kivalina Federal Scout Readiness Center (NOA-00587), is treated Eligible as a multiple property, under the Alaska Federal Scout Readiness Centers Multiple Property Programmatic Agreement, 1959-1974 (NPS 2013). The other 21 sites are unevaluated for eligibility on the NRHP. These sites include eight sites with human remains, and seven structures or buildings that date to the historic era. An additional historic site is the historic village of Kivalina, located at the north end of Kivalina Lagoon. Prehistoric sites in the area contain features such as possible house pits and artifact scatters. One prehistoric site, NOA-00362, was partially excavated and destroyed during construction of a water treatment plant in 2009.

5.4 Construction Timing

To minimize impacts on the environment, there are certain restrictions on construction activity. To protect nesting migratory birds, the USFWS recommends that no fill or clearing activities occur between June 1 and July 31[1]. Under the Migratory Bird Treaty Act (MBTA; 16 U.S. Code 703), it is illegal for anyone to "take" migratory birds, their eggs, feathers, or nests. "Take" includes by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing, or transporting any migratory bird, nest, egg, or part thereof. In Alaska, all native birds except grouse and ptarmigan (protected by the State of Alaska) are protected under the MBTA. The destruction of active bird nests, eggs, or nestlings that can result from spring and summer vegetation clearing, grubbing, and other site preparation and construction activities would violate the MBTA.

The USFWS recommends that fill and clearing activities be performed outside of this time frame to help project sponsors comply with the MBTA. It is a recommendation, not a regulation.

Consultation with USFWS should occur prior to construction to identify any revisions to this window. Coordination with USFWS during the development of any project should occur to ensure compliance with applicable regulations and laws.

5.5 Environmental Clearances, Permits, and Consultations

The follow table lists potential environmental clearances, permits, and consultations from different regulatory agencies and the anticipated time frame to complete each process.

[1] Based on Northern region requirements.

"Kivalina…is very beautifully situated when the weather is nice and calm. But when the wind blows from the south, it raises the water in the ocean until it sometimes comes over the banks, it washed out the southeast bank of the island and the natives are beginning to talk of moving."

Clinton Replogle, School Teacher, 1911

SOURCE: ANTHC 2011

Table 1. Potential Environmental Clearances, Permits, and Consultations and their Time Frames

Clearance/Permits/ Consultation		Approximate time frame*	Agency/ Organization	Notes
NEPA document	Categorical Exclusion	3-12 months		For federal actions
	Environmental Assessment	1 year		For federal actions
	Environmental Impact Statement	3-5 years		For federal actions
Section 106 Initiation of Consultation		30 days	SHPO/Tribes	
Section 106 Finding of No Historic Properties Affected		30-120 days	SHPO/Tribes	
Section 7 Consultation for Threatened and Endangered Species		30-120 days	USFWS	
Consultation regarding clearing windows		14-30 days	USFWS	For proposed ground-disturbing activities
Essential Fish Habitat		14-30 days	USFWS	For in-water work
Title 16 Fish Habitat Permit		30-90 days	ADF&G	Anadromous stream
404 Wetland Permit		120 days	USACE	For fill in wetlands
APDES Construction General Permit		30 days	ADEC	Typically obtained 1 month prior to construction

APDES = Alaska Pollutant Discharge Elimination System; NEPA = National Environmental Policy Act; SHPO = State Historic Preservation Officer
*These represent typical time frames. The actual time needed to complete each process can vary and may be significantly longer in some cases.

6 Summary of Community Issues

The SMP is intended to address matters of concern to the community that are directly or, in some cases, indirectly related to climate change. These community issues were identified through a literature review, community survey results, and input from community residents at a community gathering.

6.1 Lack of/Inadequate Community Infrastructure

Kivalina lacks much of the basic community infrastructure found in other communities. One reason for this is that agencies have been reluctant to make infrastructure improvements out of concern that the investment will be lost due to climate-change-related erosion and flooding. The most critical infrastructure Kivalina is lacking relates to sanitation (water, sewage, and landfill).

In anticipation of relocation, many improvements to the community have been deferred, but relocation efforts have taken much longer than originally expected.

Kivalina is one of two communities in the Northwest Arctic Borough that does not have a piped water system. The community water system has a limited capacity (about 1,200,000 gallons) and is not sufficient to meet community needs. Storage tanks can run dry, forcing residents to find other water sources, such as hauling ice. The lack of an adequate water supply results in health concerns that are magnified by overcrowding and lack of a centralized sewer system. The water supply is also inadequate for fire fighting and other uses, such as dust control.

The lack of adequate sanitation is the most immediate health threat in Kivalina.

SOURCE: ANTHC 2011

In August 2012, the village experienced heavy rainfall, which caused flooding. The flooding damaged the community's water intake line so that it could not be used to pump water into the water tanks. Without water, the school was forced to close for 5 weeks until a water supply could be re-established. The landfill also flooded, bringing trash and raw sewage into the lagoon. Repairs were not completed in time for the community to completely fill the storage tanks before freezing temperatures occurred. The community was forced to ration water until the following spring.

The water system is also being threatened: "Bank erosion in the Wulik River is decreasing water quality and could compromise the ability of the existing water treatment system to deliver safe water in adequate quantities" (ANTHC 2011).

As discussed above, Kivalina also still uses "honey buckets" instead of a piped sewer system. This creates health concerns due to accidental spills during collection and storage. Fecal coliform has been found in the Kivalina Lagoon.

"Alaska communities without piped water and sewer have been shown to have higher rates of skin, gastrointestinal, and respiratory infections"
(Hennesey et al. 2008).

SOURCE: ANTHC 2011

The landfill appears to exceed its capacity. There is no active management of the dump, no burn box, and no system to collect hazardous waste. The trash does not have a gravel cap. The dump is located near the airport, which creates safety concerns because of the dump's potential to attract birds. The dump area is also subject to winds, erosion, and flooding, which have the potential to spread trash outside the dumpsite. Community residents indicated a need for a dump truck and trash pickup 5 days per week. Residents also felt that dumpsters were desirable.

Other infrastructure-related concerns that were identified include:

- Roads need improvements. The roads are filled with snow every winter and there is no way to quickly remove snow. Melting snow creates large puddles that make the roads challenging for travel. A loader and water truck are needed in order to make improvements to the roads. Some residents indicated the roads should be paved.
- Additional or replacement buildings are needed in the community. Buildings specifically identified by community residents include a laundromat, senior center, City building, and Indian Reorganization Act (IRA) building.
- A fire department and improved fire response are needed.
- The south wall of the school has mold and the gym roof leaks.
- The fuel tanks are potentially contaminating the soil and some residents considered it unsafe to have the fuel tanks so close to the area.
- The airport does not support medevac planes.

6.2 Air Quality

In recent years, there have been air quality concerns in Kivalina. Traditionally, wildfires are rare in this part of the state. However, due to warmer and drier summers, more frequent lightning, an increase in woody plants, and tinder dry conditions, there has been an increase in wildfires. Smoke from a wildfire can travel many miles and create problems for people with respiratory issues.

Dust is another air quality concern. The road surface is sand and gravel. When it is dry, dust is kicked up by wind and passing vehicles. The airstrip is also gravel, and dust is generated by takeoffs and landings. The dust from the roads and airstrip then gets onto drying racks, into homes, into waterways, on vegetation, and into rainwater collection barrels. There is no dust suppression system available in Kivalina (ANTHC 2011). Community residents indicated a new water truck is needed in order to address road/airport dust.

Residents were concerned about air quality concerns related to honey buckets. They indicated that honey bucket waste can be found in the village and can dry up and be inhaled by residents. People can also come into direct contact with the waste, which has the potential to create health problems.

Allergens are also becoming an issue. As weather changes cause new vegetation to become established in the area, the new plants tend to produce more pollen than the tundra plants that have historically occupied the area.

Residents were also concerned about potential emissions from Red Dog Mine, the power plant (AVEC), and the school.

6.3 Inadequate Housing

Due to erosion, the area occupied by Kivalina has been slowly shrinking over time; the result is that overcrowding is becoming a significant concern for the community. It has been reported that as many as 15 people may live in a single house (Gray 2010b).

According to community residents, most houses are overcrowded and there is no land on which to build additional housing. Many of the existing homes are also in need of repairs. Specific concerns identified include mold and roofing issues. In the winter, there is also a problem with snow piles blocking doorways, effectively barricading people inside.

Residents also indicated that the community had a lack of low-income housing and elder housing.

6.4 Changes to Subsistence Resources

Residents depend on subsistence resources for healthy foods such as caribou, fresh water and marine fish, and marine mammals. Warming temperatures have changed availability and distribution of those resources. It has also increased safety hazards, such as those of traveling over increasingly thin sea ice. Braund and Associates (2005) conducted community interviews to document impacts to subsistence use, as well as increased hazards from thinning sea ice. Impacts they identified include:

- A shorter season for hunting Ugruk (bearded seals) as they migrate north with the sea ice
- Earlier arrival of bowhead and beluga whales
- Because the ice is not thick enough near the village, subsistence users must travel farther to obtain resources
- Dangerous ice conditions inhibit subsistence use south of the community and impede access to open leads
- Fewer walrus migrate near the community than in the past
- Ice conditions and a greater number of leads affect the availability of marine mammals (e.g., bowhead whales are migrating farther from shore)

In other interviews, residents indicated that many of the ice cellars are no longer functional; they are, for example, too wet, too warm, or frozen shut. The reduced capacity of ice cellars could lead to spoilage of meat after a bowhead whale is harvested.

"I always bleach seal skins in mid-winter. It has to stay really cold. But since 2005, the weather always changes and every year it ruins the skins. I need to find a new way."

Lucy Adams

SOURCE: ANTHC 2011

6.5 Lack of Evacuation Shelter/Place of Refuge

Evacuation is a problem for Kivalina. There is no road access, and poor weather can limit air service. The only other way off the island is by boat. There is no adequate evacuation shelter in the community, and there are limited options for evacuation during fall storms. Evacuation to the school is problematic, as there is concern that the building could be damaged by a large storm surge.

> *We need a road outta here.*

SOURCE: Community Resident. Community Background Survey

On September 12, 2007, the Northwest Arctic Borough conducted a voluntary evacuation of Kivalina as a result of a severe storm predicted by the National Weather Service. Ninety people were flown to Kotzebue, 131 people were transported to the Red Dog Mine Port site, and 86 people remained in the village. The evacuation to the port site required people to use boats to transport ATVs across Singuak Entrance channel and then travel by ATV the rest of the way. While no one was hurt during the evacuation, there were potential threats to human safety, including during the transport of people and ATVs across the Singuak Entrance. According to the Government Accountability Office (2009), villagers reported that the evacuation was so dangerous it should never be attempted again (Gray 2010b).

> *It was a scary experience to be an evacuee during the evacuation in 2006. We need an evacuation committee and plans with proper equipment.*

6.6 New School

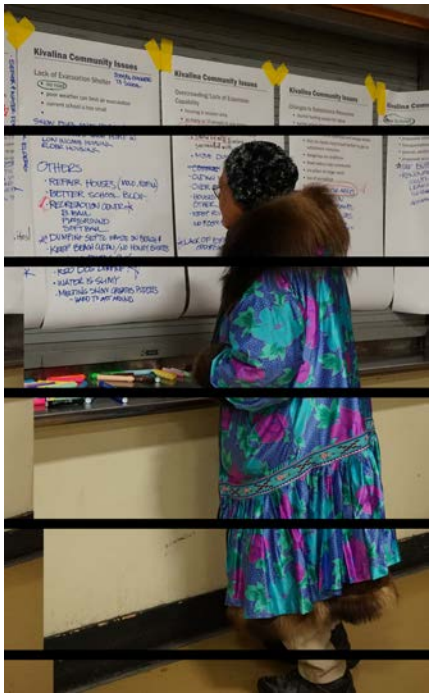
In 2011, the State of Alaska committed to building a new school in Kivalina as part of an education lawsuit known as the Kasayulie case[2]. Due to the erosion issues in Kivalina, the school was to be built outside the village and would require an access road. The proposed school site is called Kisimagiuqtuq and is approximately 7 miles north of the community. The site was selected because it is on high ground and may be a potential gravel source. The access road would also help the community by functioning as an evacuation road if necessary. The access road may also facilitate the development of a new landfill, as the existing landfill has reached capacity.

[2] The Kasayulie case refers to a lawsuit that alleged funding inequalities for rural public schools. The case was settled in 2011. As part of the settlement, the State agreed to build new schools in Emmonak, Koliganek, Nightmute, Kwethluk, and Kivalina.

There are some concerns regarding the location of the new school. Some residents feel it is too far away. Transportation to and from school would have to be provided, as it is too far from the village to walk. The distance also makes it more difficult for parents who have to pick up their children during the day if they get sick. Also, the proposed access road crosses the lagoon, which some believe would be undesirable during bad weather.

6.7 Community morale

The lack of progress with the community relocation and the continuing threat of natural hazards have been challenging for the mental health of the community. As one resident stated during a public meeting for the Kivalina Consensus Building Project, "all of the community's dreams have been repeatedly crushed" (Gray 2010b).



Community residents have indicated there is a need for an overseer, as they feel like no one is looking out for them.

Residents also expressed that the City and the IRA need to work together more. They indicated a desire for more community meetings and better communication because they felt like they did not know what was going on even though the decisions being made affected them.

6.8 Funding

Most solutions to erosion and flooding problems require a substantial capital investment. This is challenging because of the limited amount of State and federal funding. There is also increasing competition for these funds as more communities face flooding and erosion problems. Even when State or federal funds are available, the local community may have to provide some of the funding. For example, since October 2009, the USACE has used Section 116 funding, which requires a 35 percent match on erosion and relocation projects. Previously, the USACE was able to use Section 117 funding, which did not require a local match. In response to competing demands for scarce funding, communities with well-thought-out plans supported by residents and funding agencies are more likely to obtain funding.

Community residents indicated that the community needs a grant writer to help them obtain funding for needed improvements and community programs. They would also like greater transparency regarding the use of funds.

6.9 Other Issues

The community identified several other concerns, including:

- Need for additional employment opportunities
- Equal opportunity for jobs/no nepotism
- Need for teen jobs/seasonal jobs by teenagers 14+
- Need VPSO
- Growing vandalism problem
- Need more early childhood education programs
- FEMA has trained people in the community, but this knowledge needs to be taught to others
- Community monitors/observers are needed to identify changing environmental conditions/ participate in the Local Environmental Observer program
- Training from Red Dog is available for a fire department
- Better communication about school closures – when, what temperature
- Student transportation is needed to the existing school and to the new site
- Need a space that is big enough to host Nana meetings
- Community access to the school showers is desired
- Need more focus on relocation
- Dumping of septic waste on the beach creates a health hazard
- Need to keep the river clean
- No honey buckets
- Potential dumping by local mining interests and the resulting impacts on the environment
- Water is slimy
- Respect for archeological sites
- Graveyard being covered with buildings
- Fish health

"I went for a walk and saw this big slide I had not seen before. I said to my wife, 'maybe the permafrost really is melting.' I had to see the climate change to finally believe it."

Joe Swan, Sr.

SOURCE: ANTHC 2011

7 Values, Vision Statement and Guiding Principles

7.1 Community Values

Community values reveal what is important to the community. Together with the guiding principals, goals, and objectives, community values provide the basis for decision making. Community values were identified both through value surveys completed by residents in April and May 2015 and in an exercise that took place during a May 2015 community meeting.

This section summarizes the input received from the survey and during the community gathering in regard to values. Both exercises listed values based on background information, but people were allowed to add their own values if to the list.

The survey administered in April and May allowed people to designate their top 10 values. As of May 7, 2105, the survey was completed by 82 residents. The top 10 values (in order) identified by residents were:

1. Family
2. Elders
3. Subsistence
4. Happy, healthy children
5. Clean water
6. Education
7. Traditional culture
8. Friends
   Community
10. Jobs and economic opportunities

Figure 6 shows how the survey values were ranked.

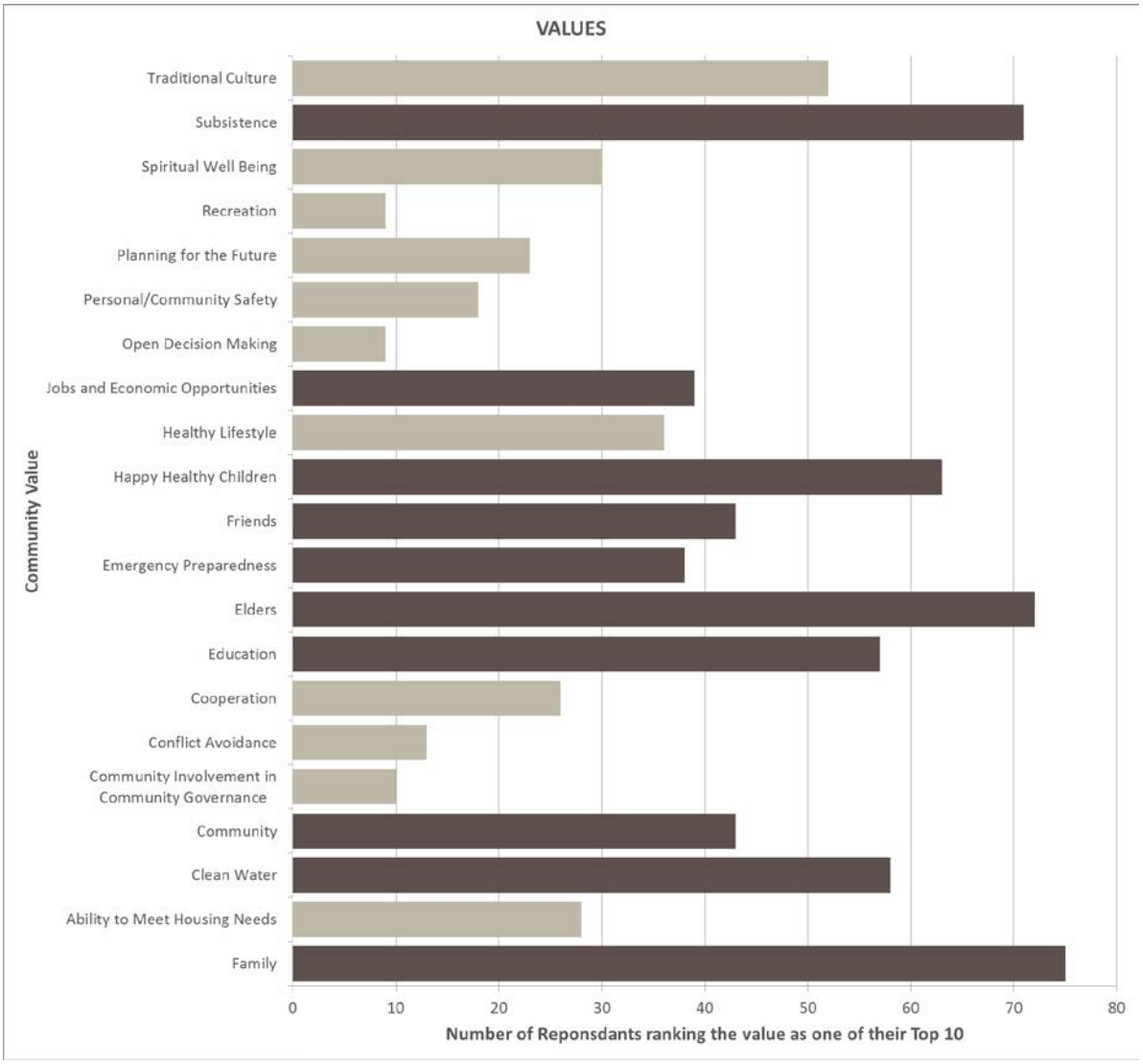
Traditional Inupiaq Values

Hard Work
Sharing
Domestic Skills
Respect for Elders
Respect for Others
Hunter Success
Cooperation
Avoid Conflict
Family Roles
Responsibility to Tribe
Knowledge of Language
Humility
Humor
Spirituality
Love for Children
Knowledge of Family Tree

We need to relocate our village soon and build an evacuation road. We need to feel safe in our village.

SOURCE: Community Resident, age 11. Community Background Survey

Figure 6. Community Values



At the community gathering, people were asked to indicate their top values. The top value identified during the meeting was the need for sewer and water. Three values—relocating the village, traditional culture, and keeping the village clean—tied for second place. Other values receiving multiple votes included respect for elders, friends, and jobs and economic opportunities.

For additional information about how the community values were identified and prioritized, please see Appendix A.

We need to relocate our village to a safer place and build our evacuation bridge towards inland.

SOURCE: Community Resident. Community Background Survey

7.2 Vision Statement

The vision statement for the SMP has been developed by the community and the SMP project team based on their Adaptation Plan, the results of the community's April 2015 vision survey, and community input during the May 2015 community meeting. The result of that process is the following SMP vision statement:

> Kivalina is a safe and resilient community. We want to see the development of an evacuation road and a new school that support the community's long-term desire to relocate. We will work together and with partners to develop projects and policies to protect our residents, infrastructure, natural environment, and subsistence resources. We will increase resiliency while respecting our traditional values. Kivalina will be a community where existing and future generations want to live.

7.3 Guiding Principles

Guiding principles provide the overall direction for the Kivalina SMP. The guiding principles, combined with the Vision Statement, should be a foundation for the SMP and provide a context for decision making so that limited capital resources can be maximized. The guiding principles were developed based on previous publications and information provided by participants during a May 2015 community meeting.

It is the hope and intent of the planning team that residents and partners working to make Kivalina more resilient will respect and promote these principles[3]. The Strategic Management Plan guiding principles are:

The Kivalina Consensus Building Project identified the following common interests:

Residents must be safe from natural hazards and growing threats of flooding and erosion

The community needs to be located close to marine subsistence resources

There must be room for community expansion (enough suitable land for their children and grandchildren to build new homes)

Basic services must include water, sewer, and solid waste

An evacuation road needs to be built

[3] As part of their overall resiliency efforts, the City of Kivalina and the Native Village of Kivalina should work together to refine these guiding principles and develop new ones if appropriate to guide their long-term efforts. Both organizations should formally adopt the guiding principles and use them to guide decision making in terms of community resiliency activities.

- Residents must be safe from natural hazards and growing threats of flooding and erosion
- Make decisions openly and as a community
- Include local input in the process
- Protect the natural environment
- Respect our traditional culture
- Use funds wisely
- Develop in a manner that strengthens the community

8 Next Steps

Based on the information presented in this *Background Planning Report*, the next step is to work with the community to develop an SMP designed to address the issues presented here. The SMP will focus on responses to climate-change-related impacts and will provide a blueprint for how the community and agencies will proceed over the next 5 to 20 years in order to relocate Kivalina.

9 References

ANTHC (Alaska Native Tribal Health Consortium). 2011. Climate Change in Kivalina, Alaska: Strategies for Community Health.

ASCG (ASCG Incorporated of Alaska). 2005. Kivalina, Alaska, evacuation/relocation road feasibility study: Anchorage, Alaska. October 2005.

Braund and Associates. 2005. Traditional knowledge and subsistence use study within the area of Cape Seppings and Rabbit Creek: Kotzebue, Kivalina, and Noatak. Prepared for the Northwest Arctic Borough.

City of Kivalina, ASCG Inc. Alaska, and Bechtol Planning and Development. 2007. Local Hazards Mitigation Plan. Approved by Kivalina City Council Resolution #07-11, November 9, 2007. http://www.commerce.state.ak.us/dca/planning/nfip/Hazard_Mitigation_Plans/Kivalina_HMP.pdf

DCCED (Department of Commerce, Community, and Economic Development). 2012. Increasing Community Resilience by Integrating Hazard Mitigation into Local Comprehensive Planning Efforts. 2012 Alaska Planning Conference, Anchorage, Alaska, November 13, 2012. http://www.commerce.state.ak.us/dnn/Portals/4/pub/AK_APA_Haz-Mit_Comp-Plan.pdf

DOWL Engineers. 1994. City of Kivalina relocation study, Kivalina, Alaska. Prepared for Kivalina City Council. Anchorage.

Government Accounting Office. 2009. Alaska Native Villages: Limited Progress Has Been Made on Relocating Villages Threatened by Flooding and Erosion. Report to Congressional Requesters, June 2009. http://www.gao.gov/assets/300/290468.pdf

Gray (Glenn Gray and Associates). 2010a. Situation Assessment: Kivalina Consensus Building Project. Prepared for the City of Kivalina.

Gray. 2010b. Kivalina Consensus Building Project, Final Report. Prepared for the City of Kivalina, July 2010.

Hennessy, T., T. Ritter, R. Holman, D. Bruden, K. Yorita, L. Bulkow, J. Cheek, R. Singleton, and J. Smith. 2008. The Relationship Between In-Home Water Service and the Risk of Respiratory Tract, Skin, and Gastrointestinal Tract Infections Among Rural Alaska Natives. *Am J Public Health*, Nov 2008; 98: 2072 - 2078.

Immediate Action Workgroup. 2009. Immediate Action Workgroup recommendations to the Governor's Subcabinet on Climate Change. March 2009.

Mason, O., W. Neal, and O. Pilkey. 1998. L*iving with the Coast of Alaska*. Duke University Press.

NPS (National Park Service). 2013. National Register of Historic Places Multiple Property Documentation Form. United States Department of the Interior National Park Service. Form prepared by Natalie K. Perrin, Heather Lee Miller, and Amanda Bennett, NHG Alaska, LLC, Anchorage.

USACE (U.S. Army Corps of Engineers). 2005. Relocation Planning Project Master Plan – Draft Report: Kivalina, Alaska. Submitted by Tryck Nyman Hayes and URS Corporation.

USACE. 2006a. Relocation Planning Project Master Plan: Kivalina, Alaska. Submitted by Tryck Nyman Hayes and URS Corporation.

USACE. 2006b. Alaska village erosion technical assistance program: An examination of erosion issues in the communities of Bethel, Dillingham, Kaktovik, Kivalina, Newtok, Shishmaref, and Unalakleet.

U.S. Census Bureau. 2000. United States Census 2000. http://www.census.gov/main/www/cen2000.html

U.S. Census Bureau. 2010. United States Census 2010. http://www.census.gov/2010census/data/

U.S. Census Bureau. 2013. Selected Economic Characteristics: Kivalina city, Alaska. American Fact Finder: 2009-2013 American Community Survey 5-Year Estimates. http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml

USFWS (U.S. Fish and Wildlife Service). 2009. Land Clearing Timing Guidance for Alaska: Plan Ahead to Protect Nesting Birds. http://www.fws.gov/alaska/fisheries/fieldoffice/anchorage/pdf/vegetation_clearing.pdf