City of Alakanuk
Hazard Mitigation Plan

2012 Update

Prepared by the Community of Alakanuk

Assisted by the State of Alaska

Department of Homeland Security and Emergency Management

Planning Division

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List of Acronyms and Abbreviations

AFG	Assistance to Firefighters Grant
ANA	Administration for Native Americans
BLM	Bureau of Land Management
CDBG	Community Development Block Grant
CFS	cubic foot per second
CHEMS	Community Health and Emergency Medical Services
DEC	Department of Environmental Conservation
DHS&EM	State of Alaska, Department of Homeland Security and Emergency Management
DHSS	Department of Health and Social Services
DMA2000	Disaster Mitigation Act of 2000 (Public Law 106-390)
DNR	Department of Natural Resources
DOF	Department of Forestry
DOT&PF	Department of Transportation and Public Facilities
FMA	Flood Mitigation Assistance
FEMA	United States Department of Homeland Security, Federal Emergency Management Agency
GPM	gallons per minute
HAZUS-MH	Hazards U.S. – Multi-Hazard
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NWS-NCDS	National Weather Service – National Climatic Data Center
PDM	Pre-disaster Mitigation
SPT	standard penetration test
STAPLE+E	Social, Technical, Administrative, Political, Legal, Economic and Environmental
USACOE	United States Army Corps of Engineers
USGS	United States Geological Survey

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

FEMA

February 22, 2013

Honorable Aaron Kameroff
Mayor, City of Alakanuk
P.O. Box 167
Alakanuk, Alaska 99554

Dear Mayor Kameroff:

The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) has approved the ***Alakanuk Hazard Mitigation Plan*** as a local plan as outlined in 44 CFR Part 201. With approval of this plan, the City of Alakanuk is now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through February 22, 2018.

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: Ann Gravier, Alaska Division of Homeland Security and Emergency Management

Enclosure

BH:bb

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 201.2, is "any action taken to reduce or eliminate the long-term risk to human life and property from 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 highlighted in other sections throughout this HMP.

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). Furthermore, all hazard mitigation assistance program planning requirements were combined eliminating duplicated mitigation plan requirements. This change also required participating National Flood Insurance Program (NFIP) communities' risk assessments and mitigation strategies to identify and address repetitively flood damaged properties. Local hazard mitigation plans now qualify communities for several Federal Hazard Mitigation Assistance (HMA) grant programs.

This HMP complies with Title 44 CFR dated December 22, 2010 and applicable guidance documents.

1.3 GRANT PROGRAMS WITH MITIGATION PLAN REQUIREMENTS

FEMA HMA 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. The Hazard Mitigation Grant Program (HMGP) is a directly disaster funded competitive disaster grant program. Whereas the other Hazard Mitigation Assistance Programs: Pre-Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA), Repetitive Flood Claims (RFC), and Severe Repetitive Loss (SRL) programs although competitive, rely on specific grant pre-disaster grant funding sources, sharing several common elements.

> *"Hazard mitigation is any sustained action taken to reduce or eliminate long-term risk to people and property from natural hazards and their effects. This definition distinguishes actions that have a long-term impact from those that are more closely associated with immediate preparedness, response, and recovery activities. Hazard mitigation is the only phase of emergency management specifically dedicated to breaking the cycle of damage, reconstruction, and repeated damage. As such, States, Territories, Indian Tribal governments, and communities are encouraged to take advantage of funding provided by HMA programs in both the pre- and post-disaster timeframes.*
>
> *Together, these programs provide significant opportunities to reduce or eliminate potential losses to State, Tribal, and local assets through hazard mitigation planning and project grant funding. Each HMA program was authorized by separate legislative action, and as such, each program differs slightly in scope and intent.*
>
> *HMGP may provide funds to States, Territories, Indian Tribal governments, local governments, and eligible private non-profits (PNPs) following a Presidential major disaster declaration. The PDM, FMA, RFC, and SRL programs may provide funds annually to States, Territories, Indian Tribal governments, and local governments. While the statutory origins of the programs differ, all share the common goal of reducing the risk of loss of life and property due to natural hazards" (FEMA 2010).*

1.3.1 Hazard Mitigation Assistance (HMA) Programs

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. In Fiscal Year (FY) 2006 was approximately $232 million, FY 2007 was $316 million, FY 2008 was $1.246 billion, FY 2009 was $359 million, and FY 2010 was $23 million.

The cost-share for these grants is 75 percent Federal/25 percent non-Federal. Communities that fulfill "Impoverished Community" criteria and receive FEMA Regional Administrator approval may be funded at percent 90 percent Federal/10 percent non-Federal.

The PDM grant 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 FY 2008, PDM program funding totaled approximately $114 million, FY 2009 was $90 million, and FY 2010 was $100 million. The cost-share for these grants 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 loss (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 2010, FMA funding totaled $40 million. The cost-share for these grants 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.

> The City of Alakanuk does not currently participate in the NFIP and is therefore ineligible for National Flood Insurance Act Grant Programs until they become a NFIP participant.

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 FY 2006 and 2007, $80 million for FY 2008, $80 million for FY 2009, and $70 million for FY 2010. The cost-share for these grants 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 Alakanuk (City). The adoption resolution is included in Appendix B.

Community Description

Section 3 provides a general history and background of the City, 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 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. The resulting information identifies the full range of hazards that the City 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. 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 Review Tool, which documents compliance with FEMA criteria.

Appendix B

Appendix B provides the adoption resolution for the City.

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

DMA 2000 requirements for the adoption of this HMP update by the local governing body are described below.

DMA 2000 Requirements
Local Plan Adoption §201.6(c)(5): [The 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). For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.
1. Regulation Checklist
Element E. Plan Adoption
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval??) (Requirement §201.6(c)(5))
Source: FEMA, October 2011

The City of Alakanuk 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 will adopt the HMP Update by resolution upon FEMA approval. A scanned copy of the resolution will be included in Appendix B.

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

3.1 LOCATION, GEOGRAPHY, AND HISTORY

Latitude: N 62.68
Longitude: W 164.62

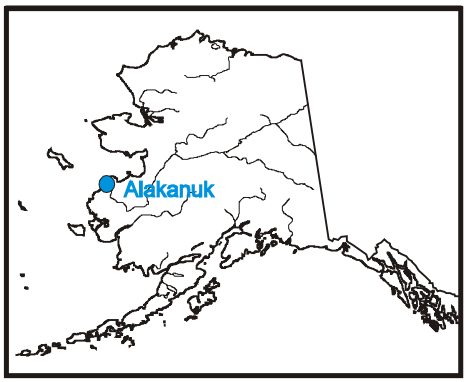


Figure 3-1 Alakanuk Location Map

Topography: Alakanuk is situated on the Yukon River Delta at the confluence of Alakanuk Pass and Kwikluak Pass, which is the southernmost branch of the Yukon River. The community is located approximately eight miles upstream of the Bering Sea. The Alakanuk area is relatively flat with very little topographic relief, and consists of low floodplain river delta which is dotted by numerous small lakes, sloughs, and old river channels. Elevations in the area range from two to nine feet above mean sea level.

Climate: According to the Environmental Atlas of Alaska, Alakanuk lies within the Transitional Climactic Zone of Alaska. This zone is defined as an area with moderate seasonal temperature variation and less cloudiness, precipitation, and humidity than a maritime climate. The climate is sub-arctic, averaging 19 inches of precipitation per year, including 60 inches of snow. The Bering Sea influences the climate by keeping summer temperatures cooler and winter temperatures warmer than the Continental Climactic Zone of the interior of Alaska. Temperatures range from –25 degrees to 79 degrees Fahrenheit.

3.2 DEMOGRAPHICS

The population of Alakanuk has fluctuated, but has generally increased over the last twenty years. Over that period, the population has experienced a 1.3% annual growth-rate based on a 1990 population of 544 persons. The current population of Alakanuk is 683. Approximately 95% of the residents of Alakanuk are Alaska Native or part Native. Alakanuk is recognized as Yupik Eskimo community. A brief summary of the pertinent information found in the 2010 census includes the following.

Median age (years) 20.4

Total number of households 160

Average number of persons per household 4.69

Number of persons below poverty level 147

Total Potential Work Force (Age 16+) 389

Total Employment 135

The population of the entire Wade-Hampton census area in which Alakanuk is located is projected to grow at a rate of 1.3% per year which corresponds favorably to the projected average growth rate for Alakanuk.

Government: The City of Alakanuk is a member of the Calista Native Corporation, and was incorporated as a second class city in 1969. The city is currently governed by a seven member city council, which consists of a mayor, a vice mayor, a secretary/treasurer, and four council members. The community also has a traditional council whose members are elected to serve terms ranging from two to four years. The day to day operations of the City are supervised by a City Administrator.

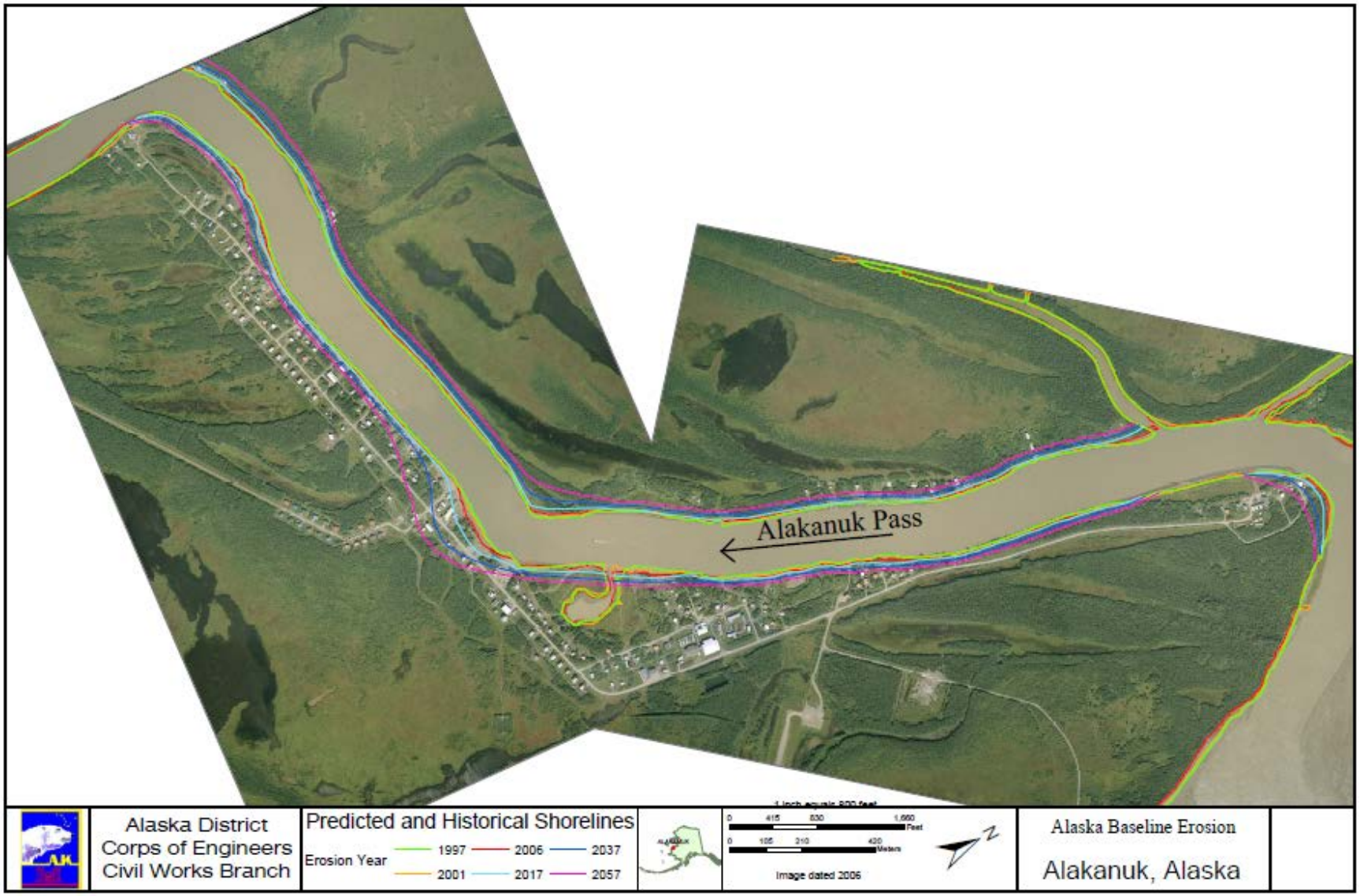
3.3 ECONOMY

The economy of the area is seasonal in nature, such that it is generally more active in the summer than in the winter. This economic instability is one reason for such modest population growth. A limited amount of permanent employment is provided by the government and local businesses. Other primary sources of income include revenue from seasonal commercial fishing and governmental assistance. Villagers also provide for themselves by hunting, fishing, trapping, and making native crafts.

As indicated by the 2010 U.S. Census, the average annual per capita income for the residents of Alakanuk was approximately $14,929, and the average per household income was approximately $34,375.

The City government is primarily funded by the State of Alaska and revenues from the Village Safe Water facility, bingo, and a 4% sales tax.

Industry: The economy in Alakanuk is primarily subsistence based, including hunting, trapping, fishing, and gathering. Some cash income is generated by commercial fishing in the Yukon River and the Bering Sea during the summer. Only a few full or part time year round jobs are available. Primary employers include the City, the Village Safe Water facility, the school, utilities, and local businesses. Nearly all households are represented at subsistence fish camps during the summer months.


Alakanuk Pass
Alaska District
Corps of Engineers
Civil Works Branch
Predicted and Historical Shorelines
Erosion Year
1997
2006
2037
2001
2017
2057
Image dated 2006
Alaska Baseline Erosion
Alakanuk, Alaska

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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.

DMA 2000 Requirements 1. Regulation Checklist
Local Planning Process §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 §201.6(b)(1): An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval; §201.6(b)(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 nonprofit interests to be involved in the planning process; and §201.6(b)(3): Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information. §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. §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. §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 A. Planning Process
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1)) A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2)) A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1)) A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3)) A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii)) A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the

mitigation plan within a 5-year cycle?) (Requirement §201.6(c)(4)(i))
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?
Source: FEMA, October 2011.

4.1 OVERVIEW OF THE PLAN UPDATE PROCESS

The City of Alakanuk developed the plan with assistance from the State of Alaska, Division of Homeland Security and Emergency Management (DHS&EM).

Updates to this plan include:

1 A review of the local hazards facing the City of Alakanuk.

2 An examination of the progress towards minimizing or eliminating those hazards.

3 A reevaluation of the community's vulnerability to local hazards.

4 Revised community demographic and economic information.

The first step in the planning process began with the Mayor scheduling a Planning Team kickoff meeting held for June 26, 2012. 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 first step in the planning process included holding a teleconference with the Alakanuk City Administrator, Hilda Stern and DHS&EM planning staff. During the meeting, DHS&EM staff familiarized Ms. Stern with DMA2000 requirements, the scope of this hazard mitigation plan update, and the estimated work schedule. During this meeting the planning team scheduled the first public meeting to present the project to the community and to identify and screen potential hazards. In addition, the planning team identified its members and primary point of contact for the planning effort and the public.

Once the planning team was formed, the following five-step process took place from June 2012 through November 2012.

1. Organize resources: Members of the planning team identified resources, including staff, agencies, and local community members, who could provide technical expertise needed in the development of the hazard mitigation plan update.
2. Assess risks: The planning team reviewed the five hazards specific to Alakanuk. The planning team updated the associated risk assessment, including the vulnerability analysis, prior to and during the development of the mitigation strategy update.
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. Update the mitigation strategy: After reviewing the risks posed by each hazard, the planning team reviewed the existing mitigation goals, objectives, and actions.

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Subsequently, the planning team identified completed objectives and prioritized future projects.

5. Monitor progress: The planning team reviewed the implementation process to ensure the success of an ongoing program to minimize hazard impacts to Alakanuk.

4.2 HAZARD MITIGATION PLANNING TEAM

The planning team consists of the City of Alakanuk Mayor Bill Lamont, Vice Mayor Gabriel Buster, City Manager Hilda Stern, Sally Leopold, Eusebia Augline, Lawrence Edmund, Anthony Shelton, and Aaron Kameroff. The DHS&EM members Ann Gravier, Ervin Petty, Dan Belanger and Scott Nelsen are providing technical assistance to the City of Alakanuk planning team. Table 1 identifies the Alakanuk Hazard Mitigation planning team.

Table 1. Alakanuk Hazard Mitigation Planning Team

Name	Title	Organization	Phone
Bill Lamont	Mayor	City of Alakanuk	907-238-3313
Gabriel Buster	Vice Mayor	City of Alakanuk	907-238-3313
Hilda Stern	City Administrator	City of Alakanuk	907-238-3313
Sally Leopold	Planner	City of Alakanuk	907-238-3313
Eusebia Augline	Planner	City of Alakanuk	907-238-3313
Lawrence Edmund	Planner	City of Alakanuk	907-238-3313
Anthony Shelton	Planner	City of Alakanuk	907-238-3313
Aaron Kameroff	Planner	City of Alakanuk	907-238-3313
Ann Gravier	Hazard Mitigation Officer	Alaska Homeland Security and Emergency Management	907-238-3313
Dan Belanger	Mitigation Officer	Alaska Homeland Security and Emergency Management	907-428-7010
Ervin Petty	Mitigation Officer	Alaska Homeland Security and Emergency Management	907-428-7015
Scott Nelsen	Mitigation Specialist	Alaska Homeland Security and Emergency Management	907-428-7010

4.3 PUBLIC INVOLVEMENT

Members of the community; both residents and businesses, neighboring communities, academia, non-profits, and local, State, and Federal agencies were invited to participate in the planning process by attending the public meetings.

Initial Public Meeting On June 26, 2012, the Alakanuk planning team held a public meeting announcing the hazard mitigation plan update project to the community and interested parties. An invitation was extended to all of the people in the community via a door to door survey questionnaire. A project newsletter describing the update process was distributed to the meeting participants by visiting Department of Homeland Security and Emergency Management staff. In addition, a copy of the newsletter was posted on the State of Alaska Department of

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Homeland Security and Emergency Managements website. Thirteen people attended the meeting.

During the meeting DHS&EM led the group through a hazard identification and screening exercise. During this process, the attendees reviewed five potential hazards (erosion, flood, earthquake, wildland fire, and severe winter storm).

After the hazard review process was completed, DHS&EM described the specific information needed from the City of Alakanuk to complete the risk assessment including the location, value, and population of residents and critical facilities in the community.

The community asset data was collected by the planning team over the summer of 2012. The resulting risk assessment revealed the assets that are exposed and vulnerable to specific hazards.

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

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 and 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 the collection of historical and anecdotal information, review of existing plans and studies, and preparation of hazard maps of 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.

DMA 2000 Requirements
Identifying Hazards §201.6(c)(2)(i): The risk assessment shall include a] description of the type, 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. §201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.
1. Regulation Checklist
Element B. Hazard Identification and Risk Assessment
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction? B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods?
Source: FEMA, October 2011.

5.2 HAZARD IDENTIFICATION AND SCREENING

For the first step of the hazard analysis, on March 9, 2010 the Planning Team reviewed nine possible hazards that could affect the Cape Nome Recording District. They then evaluated and screened the comprehensive list of potential hazards based on a range of factors, including prior knowledge or perception of their threat and 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 six hazards pose the greatest threat to the City: earthquake, erosion, flood, ground failure, severe weather, and tundra (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.

UPDATE

The City of Alakanuk planning team and residents met on June 26, 2012 and reviewed the six hazards identified during the previous planning phase. They determined two of the six hazards, flooding and soil erosion, posed the most immediate threat due to their frequency of occurrence and potential for damage upon the community's housing and infrastructure.

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.
Earthquake	Yes	Periodic, unpredictable occurrences. Earthquakes damage could threaten approximately 7 houses on the north end of town. Cracks form on the runway. The City experienced no damage from the 11/2002 Denali EQ, and felt the 1964 Good Friday Earthquake.
*Erosion	Yes	Storm generated coastal erosion along north and west shorelines at a rate of 5 to 10 feet per year.
*Flood	Yes	Four primary types of flooding occur in the City including: storm surge, rainfall-runoff, snowmelt, and ice override flooding.
Ground Failure (landslide, permafrost, subsidence)	Yes	Landslides are not a threat to the City, however the City stated melting permafrost contributes to erosion. Permafrost is present throughout the City where thawing and upheaval periodically causes houses to shift and damages the airport runway.
Tsunami & Seiche	No	This hazard does not exist for the City.
Volcano	No	This hazard does not exist for the City.
Weather	Yes	Extreme weather (storms, wind, cold), rain: 300 days annual average. Annual weather patterns, severe cold, freezing rain, snow accumulations are the predominate threats. Severe weather events cause fuel price increases and frozen pipes. Heavy snow loads potentially damage house roofs. Winds potentially remove or damage roofs. -72ºF occurred in 1989. The City experiences -68ºF annually, causing # 2 heating oil freezing.
Tundra Fire (Wildland)	Yes	This City has identified tundra fire potential stemming from lightning and human caused events.

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5.3 HAZARD PROFILE

DMA 2000 requirements and regulations for hazard profiles are described below.

DMA 2000 Requirements
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
1. Regulation Checklist
Element B. Hazard Identification and Risk Assessment
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i)). B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction?
Source: FEMA, October 2011

The specific hazards selected by the Planning Team have been examined based upon 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 the City's residents and critical facilities are further described in Section 6 as part of the overall vulnerability summary for each hazard)
- Probability of future events

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

Probability is determined 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 percent 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 percent 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 percent 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 percent of property is severely damaged

Magnitude and severity are determined using the criteria identified above.

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

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5.3.1 Earthquake

5.3.1.1 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 numerous casualties. The most common effect of an earthquake is ground motion.

Ground motion generally increases with the amount of energy released and decreases with distance from its epicenter. An earthquake generates seismic waves from the earth's interior and surface waves travelling along the earth's crust. 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 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. 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 ft., 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 rock falls, rockslides, and soil slides. Debris flows are created when surface soil on a steep slope 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 upon the damage and observed effects on people and the natural and built environment. The intensity generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. The epicenter is the point on the earth's surface directly above the earthquake's origin. The scale most often used in the U.S. to measure intensity is the Modified Mercalli Intensity (MMI) Scale. As shown in Table 5-4, the MMI Scale consists of 12 increasing levels of intensity that range from imperceptible to catastrophic destruction.

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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

Modified Mercalli Intensity	Magnitude	Description	Perceived Shaking
I	1.0 – 2.0	Not Felt	Felt by very few people; barely noticeable.
II	2.0 – 3.0	Weak	Felt by a few people, especially on upper floors.
III	3.0 – 4.0		Noticeable indoors, especially on upper-floors, but may not be recognized as an earthquake.
IV	4.0	Light	Felt by many indoors, few outdoors. May feel like heavy truck passing by.
V	4.0 – 5.0	Moderate	Felt by almost everyone, some people awakened. Small objects moved; trees and poles may shake.
VI	5.0 – 6.0	Strong	Felt by everyone. Difficult to stand. Some heavy furniture moved; some plaster falls. Chimneys may be slightly damaged.
VII	6.0	Very Strong	Slight to moderate damage in well built, ordinary structures. Considerable damage to poorly built structures. Some walls may fall.
VIII	6.0 – 7.0	Severe	Little damage in specially built structures. Considerable damage to ordinary buildings, severe damage to poorly built structures. Some walls collapse.
IX	7.0	Violent	Considerable damage to specially built structures, buildings shifted off foundations. Ground cracked noticeably. Wholesale destruction. Landslides.
X	7.0 – 8.0	Extreme	Most masonry and frame structures and their foundations destroyed. Ground badly cracked. Landslides. Wholesale destruction.
XI	8.0		Total damage. Few, if any, structures standing. Bridges destroyed. Wide cracks in ground. Waves seen on ground.
XII	8.0 or greater		Total damage. Waves seen on ground. Objects thrown up into air.

(MMI 2011)

5.3.1.2 History

The Planning Team determined the City has not experienced damaging effects from their historical earthquake events and only needed to be concerned with earthquakes with a magnitude > M 5.0. Table 5-5 lists historical earthquakes from 1973 to present which exceeded M5.0 located within 100 miles of the City. These earthquakes did not induce any major damage due primarily to their community structure types and foundation support system designs.

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North America's strongest recorded earthquake occurred on March 27, 1964 in Prince William Sound, measuring M 9.2 and was felt by many residents throughout Alaska. Alakanuk felt ground motion resulting from this historic event; however, no local damage occurred.

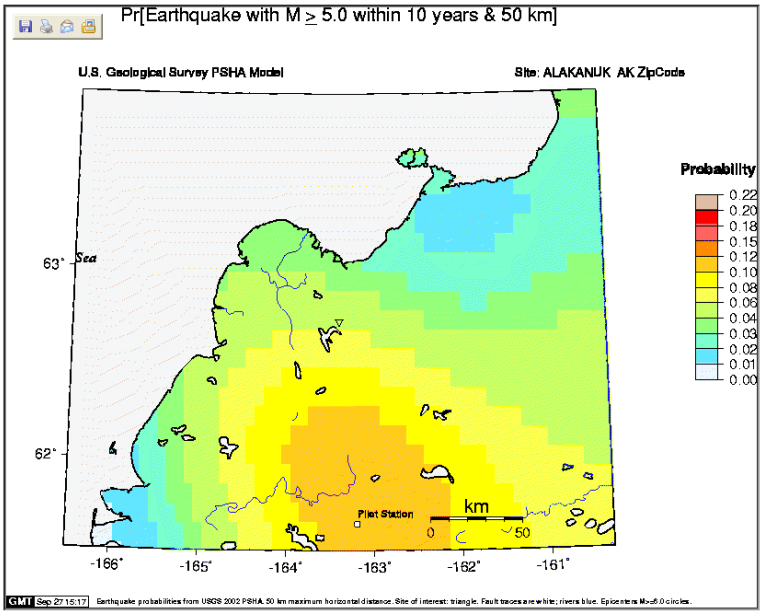

Figure 1. Alakanuk Earthquake Probability

Source – USGS Earthquake Probability Mapping – probability of a M>/=5.0 within 10 years. http://eqint.cr.usgs.gov/eq/cgi-bin/eqprob.cgi 2006.

5.3.1.3 Location, Impact, and Probability of Future Events

Location

Following information identifies the geographic area(s) affected by each specified hazard.

The entire geographic area of Alaska is vulnerable to the effects of an earthquake. Figure 1 was generated using the USGS Earthquake Probability Mapping model and indicates a 4% probability of a greater than 5.0 magnitude earthquake occurring over the next 10 years in the vicinity of Alakanuk.

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 approximations and simplifications that are necessary for a comprehensive analysis.

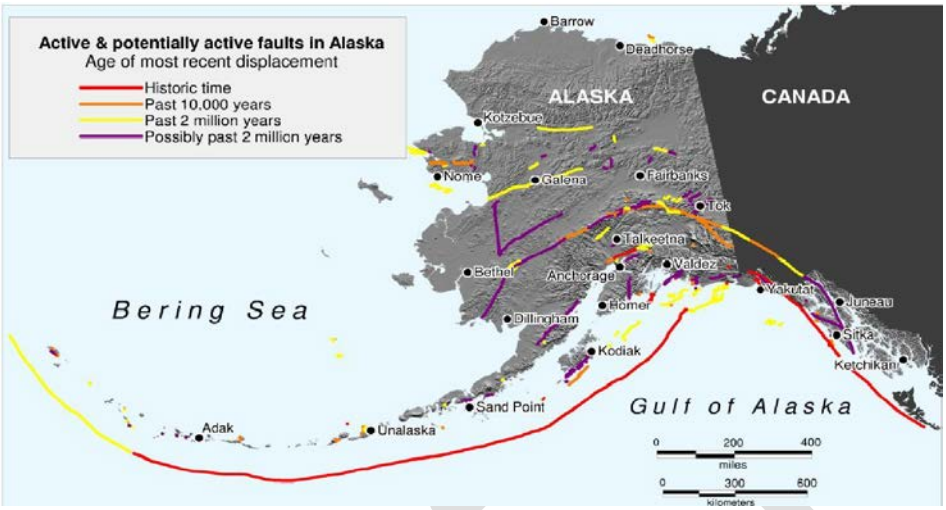

Figure 5-1 Active and Potentially Active Faults in Alaska

The DGGS Neotectonic Map of Alaska depicts Alaska's known earthquake fault locations. DGGS states,

> *"The Neotectonic Map of Alaska is the most comprehensive overview of Alaskan Neotectonics published to date; however, users of this map should be aware of the fact the map represents the author's understanding of Alaskan Neotectonics at the time of publication. Since publication of the Neotectonic map, our understanding of Alaskan Neotectonics has changed and earthquakes have continued to occur. For example, M7.9 Denali fault earthquake ruptured three faults, including the Susitna Glacier fault, which was previously undiscovered..." (DGGS, 2009).*

Impact

The City 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 the City, 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

Alakanuk 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 Alakanuk. Impacts to the community would be considered negligible with minor injuries, less than 10% of property damaged, and little to no permanent damage to transportation or infrastructure or the economy.

While the probability of an earthquake is likely throughout the State of Alaska, based on its geographic location, it is unlikely that an earthquake would be centered in an area around Alakanuk. Figure 1 was generated using the USGS Earthquake Probability Mapping model and

indicates a 4% probability of a greater than 5.0 magnitude earthquake occurring over the next 10 years in the vicinity of Alakanuk.

Figure 5-2 shows Alakanuk as having a four percent probability (chance) of experiencing a M 4.0 earthquake event lasting 0.20 seconds within any 50 year period.

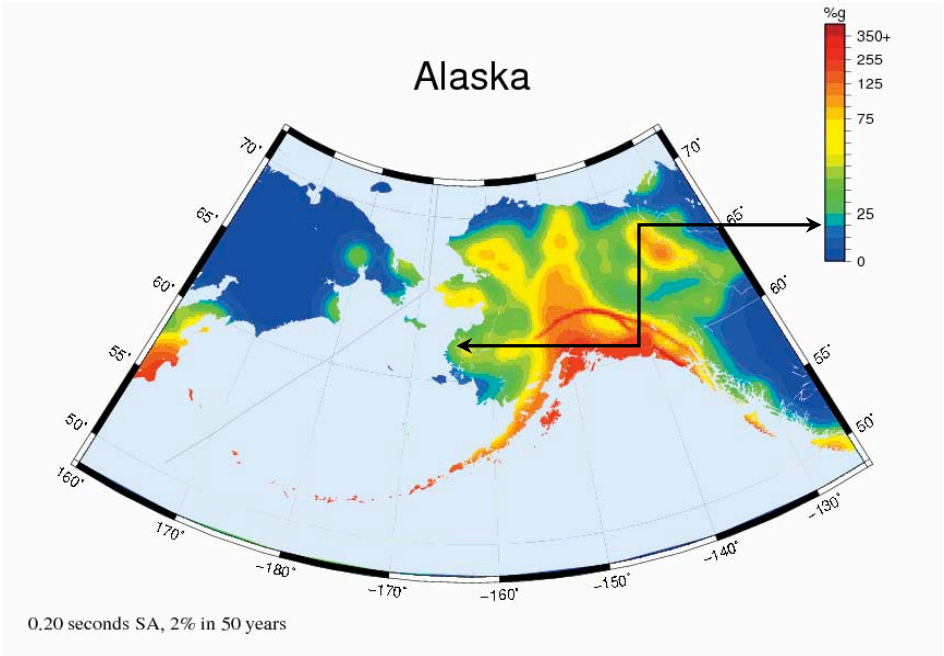

Figure 5-2 Shake Map depicting 4% Probability in 50 years (USGS 2007)

5.3.2 Erosion

5.3.2.1 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 it may be exacerbated by human activity.

Coastal and riverine erosion are problems for communities where disappearing land threatens development and infrastructure. Riverine erosion is a major concern for the City as it threatens the embankment, structures, and utilities of Alakanuk's residents. Alakanuk is primarily vulnerable to riverine erosion.

Riverine erosion results from the force of flowing water 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, riverine erosion is a constant issue, while episodes of erosion may only occur occasionally in more stable meandering channels.

The forces of coastal erosion are embodied in waves, currents, and winds. Surface and ground water flow, and freeze-thaw cycles may also play a role. Not all of these forces may be present at any particular location. Coastal erosion can occur from rapid, short-term daily, seasonal, or annual natural events such as waves, storm surge, wind, coastal storms, and flooding, or from

human activities including boat wakes and dredging. The most dramatic erosion often occurs during storms, particularly because the highest energy waves are generated under storm conditions.

Land surface erosion results from flowing water across road surfaces due to poor or improper drainage during rain and snowmelt run-off which typically result from fall and winter sea storms.

5.3.2.2 History

Erosion at Alakanuk is episodic, occurring during two times of the year; break-up and fall storm season. During breakup, the Yukon River experiences high flows due to thawing snow and ice as well as surges caused by the failure if ice jams upriver. These higher flows increase the hydraulic friction of water against the soil of the bank. This particularly affects the scour hole where erosion is caused by direct impingement of the current against the bank.

In 1975, riverine erosion destroyed the cannery in Alakanuk and forced the relocation of many homes. In 1993, 20 feet of bank eroded in one day. Figure 2 illustrates the extent of erosion that has occurred over the years (eroded land is depicted as lots within Alakanuk Pass).

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

Location

Following information identifies the geographic area(s) affected by each specified hazard.

Alakanuk is located along the banks of Alakanuk Pass, a major southern channel of the Yukon Delta. It is 15 miles from the Bering Sea, and approximately 162 air miles northwest of Bethel. The community is built along the banks of Alakanuk Pass (Figure 2&3). All of the structures located along the banks of the river are subject to the effects of erosion.

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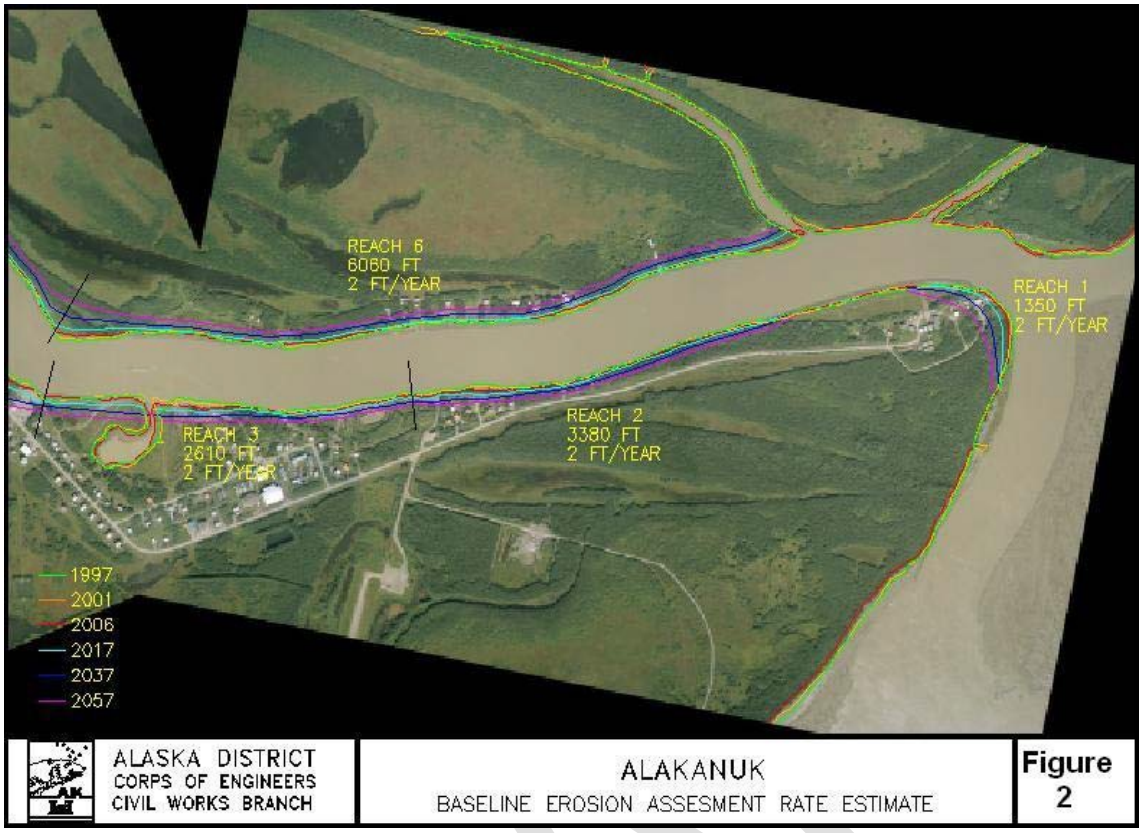

Figure 2. Alakanuk Erosion Reaches 1, 2, 3, and 6

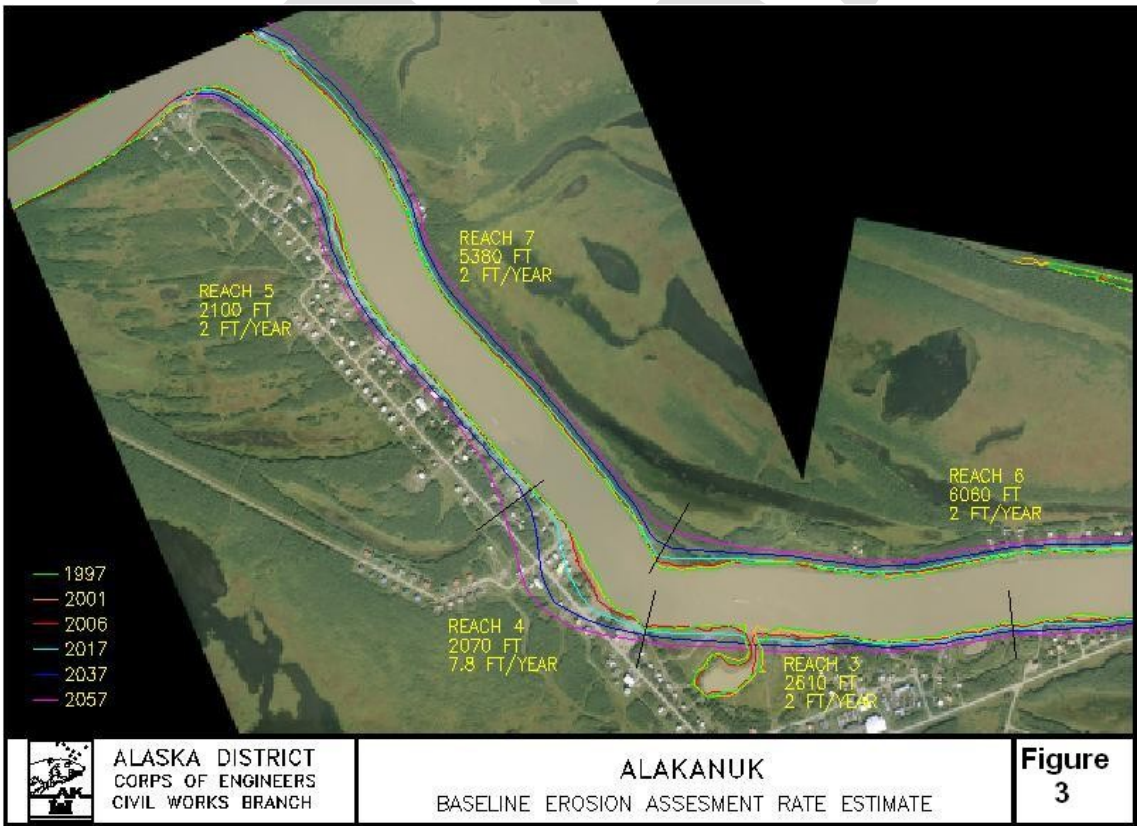

Figure 3. Alakanuk Erosion Reaches 3, 4, 5, 6, and 7

Extent

River erosion rarely causes death or injury. However, erosion causes significant destruction of property, development, and infrastructure.

Rivers constantly alter their course, changing shape and depth, seeking a balance between the sediment transport capacity of the water and the sediment supply. This process, called riverine erosion, is usually seen as the wearing away of riverbanks and riverbeds over a long period of time.

Riverine erosion is often initiated by high sediment loads or heavy rainfall. This generates high volume and velocity run-off which concentrates in the lower drainages within the river's catchment area. When the stress of the river flow exceeds the resistance of the riverbank material, erosion occurs. Fast-flowing rivers use the increased sediment load to further scour their banks downstream. Eventually, the river deposits its sediment in slower moving sections leading to the deposition of sediment further downstream or in dams and reservoirs. The deposition may eventually lead to the river developing a new channel.

While all rivers change in the long-term, short-term rates of change vary significantly. 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. The erosion rate depends on the sediment supply and amount of run-off reaching the river. These variables are affected by many things including earthquakes, floods, climatic changes, loss of bank vegetation, urbanization, and the construction of civil works in the waterway.

Erosion along the banks of Alakanuk Pass is generally caused by a combination of factors:

- The natural process of a river to find the path of least resistance. Based on a review of historic aerial photographs, the river appears to be trying to straighten itself out. This is most noticeable on the north bank where it forms the "S" bend. Over the last 20 years, the "S" bend has straightened, causing the south bank in front of the city to erode.
- Possible increased flow into Alakanuk Pass resulting from flow changes in the Yukon River.
- Increased boat traffic close to the shoreline.
- Ice scouring during spring breakup.
- Runoff from snowmelt and rainfall.

This picture depicts the erosion problem adjacent to River Street where 20 feet of shoreline was lost in 1 day.

Photo 1: Typical shoreline, Reach 6.

Photo 2: Looking at Reach 1. The bank immediately downstream is accreting.

This photo, taken June 26, 2012, depicts riverine erosion threatening residential housing.

Impact

The following is from the *January 27, 2009 Corps of Engineers, Community Erosion Assessment*

The period of analysis for this evaluation is 50 years and all damage categories have net present values calculated based on the federal fiscal year 2009 discount rate of 4 5/8 percent. The sections below detail expected losses with a summary provided in Table 1.

Alakanuk is losing approximately 61,650 square feet of land per year (1.42 acres) throughout the aforementioned seven reaches. It is expected that 72.18 acres will be lost over the 50-year period of analysis. Estimated land losses include 3.16 acres in Reach 1, 7.91 acres in Reach 2, 6.11 acres in Reach 3, 18.90 acres in Reach 4, 9.30 acres in Reach 5, 14.19 acres in Reach 6, and 12.60 acres in Reach 7. Total land damages in Alakanuk for the period of analysis are expected to be $722,000 with a net present value of $288,000. This represents an average annual loss of about $14,900.

The residential damages in Alakanuk are spread out along the entire community and are located in all seven reaches. There are 59 outbuildings, including 30 residences, fish camps, and related structures at risk within the project area.

Projected commercial damages in Alakanuk are spread throughout the community and lie within Reaches 4, 5, and 6. There are five buildings at risk: one of the retail stores, two native store buildings, and two old fuel farm buildings. The old fuel farm is abandoned and located at the upstream end of the development across Alakanuk Pass.

Ten public buildings are at risk in Alakanuk over the 50-year period of analysis. Six of these structures are associated with the city including a storage building, workshop, city offices, garage, fire department, and a utility building associated with water and sewer. The Catholic Church has all three of its buildings at risk, including one outbuilding. The last at-risk structure is the tribal hall and its offices. All of these public structures are located in Reach 4.

Total structural damages in Alakanuk for the period of analysis are expected to be $17.2 million with a net present value of $5.8 million and an average annual loss of about $298,500.

The portion of Alakanuk's infrastructure that sits within the 50-year erosion profile includes the following: 47,320 feet of roads (including the barge landing), 230 feet of boardwalks, 3,880 feet of water lines, 2,750 feet of sewer lines, 24 utility poles with associated power and phone lines, and 14 fuel storage tanks with an estimated combined volume of 63,730 gallons. Damages to roads and the barge landing have a total value of $19.4 million and a net present value of $12.6 million. Damages to boardwalks have a combined value of about $67,000 and a net present value of $11,000. Estimated water line damages have a total value of $1.1 million and a net present value of $215,000. There are several instances where erosion is likely to affect the midpoints of these pipes first, in which case large sections of the system would be compromised at the same time. This preliminary analysis does not attempt to differentiate these effects or to assign damages to the loss of services provided.

The sewer lines have a total value of $828,000 and a net present value of $186,000. Sewer lines are subject to the same considerations as water lines regarding the erosion of midpoints in the system.

The expected damages to fuel tanks have a total value of about $341,000 and a net present value of $156,000. Utility poles have a total value of about $8.5 million and a net present value of $2.1

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million, each of these is valued at $354,000; this includes the value of associated power and communication lines.

In total, Alakanuk has $30.2 million of infrastructure at risk of erosion. The combined net present value of these items is $15.2 million. The average annual loss of infrastructure is valued at $786,600.

Alakanuk has numerous fuel tanks spread throughout the community. Each of these is considered an environmental hazard as their surrounding soils are likely contaminated and could harm the local ecosystem and fish stocks were they to erode away. Decommission and closure of these facilities will be needed to avoid these harmful effects.

Total fuel decommissioning and closure costs in Alakanuk are expected to be $1,834,000 over the 50-year period of analysis. The net present value of these costs is about $636,000 and the average annual loss for this damage category is about $32,800.

Table 1 Expected Damages over 50-Year Period of Analysis

Damage category	Quantity	Time Span (Years)			Total value (50 years)	Net Present Value	Average Annual Loss
		0-10	11-30	31-50			
Land (acres lost)	72.18	$ 156,000	$ 283,000	$ 283,000	$ 722,000	$ 288,000	$ 14,900
Residential	30	96,000	4,720,000	4,643,000	9,460,000	2,714,000	140,200
Commercial	5	--	1,261,000	820,000	2,081,000	601,000	31,000
Public buildings	10	2,525,000	535,000	2,566,000	5,626,000	2,466,000	127,300
Infrastructure	--	11,895,000	8,133,000	10,180,000	30,208,000	15,234,000	786,600
Environmental hazards	--	--	1,004,000	830,000	1,834,000	636,000	32,800
Total damages	--	**$14,672,000**	**$15,936,000**	**$19,322,000**	**$49,931,000**	**$21,939,000**	**$1,132,800**

Probability of Future Events

Based on studies completed by DOT&PF and the USACOE, and on a review of aerial photographs from 1951, 1965, 1975, 1991, and 1997, it is highly likely that all structures located along the banks of Alakanuk Pass are vulnerable to erosion. Impacts to the community are considered critical with the potential for injuries or illnesses resulting in permanent disability, complete shutdown of critical facilities for at least two weeks and more than 25% of property being severely damaged, and a loss of developable land. Riverine erosion can increase sedimentation in harbors and river deltas, hindering channel navigation. Other problems include reduction in water quality due to high sediment loads, loss of native aquatic habitats, damage to public utilities (roads, bridges and dams) and maintenance costs associated with prevention or control of erosion sites.

5.3.3 Flood

5.3.3.1 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.

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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.

While there are many different types of flooding, Alakanuk primarily experiences rainfall-runoff, snowmelt, and ice jam floods. Rainfall-runoff flooding, the most common, usually occurs in the late summer and early fall. Snowmelt flooding occurs in the spring.

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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 floods typically occur from April through June. The depths of the snowpack and spring weather patterns influence the magnitude of flooding.

Ice jams can form during fall freeze up, in midwinter when stream channels freeze forming anchor ice and during spring breakup when the existing ice cover gets broken into large blocks that get stuck at either man-made or natural constrictions. Flooding upstream occurs after an ice jam develops, causing water to rise behind the jam. When the jam fails (releases), the stored water causes downstream flooding. Damage from ice jam flooding is usually severe due to the rapid change in the water level and the associated icy debris. Ice jams usually develop where the channel slope decreases, or where constrictions occur such as bridges, river bends and reservoirs. During spring break up, ice jams commonly congest the river systems. This type of flooding causes significant damage in Alakanuk.

Timing of events

Many floods are predictable based on rainfall patterns. Most of the annual precipitation is received from April through October with August being the wettest. This rainfall leads to flooding in early/late summer and/or fall. Spring snowmelt increases runoff, which can cause flooding. It also breaks the winter ice cover, which causes localized ice-jam floods.

5.3.3.2 History

- 1952 - Highest water level on record. Approximately 5 feet deep in the highest part of the old village.
- 1971 - All buildings flooded except for the store.
- 1972 - Approximately 2 feet of water in the highest part of the old village. 70 houses were flooded.
- 1975 - 49 houses flooded. Electrical transformers were under water.
- 1984 - 2 or 3 houses flooded, most houses surrounded.
- 1985 - High water mark 6 feet below the top of the deck on the upstream, landward side of the high school.
- 2005 (May 14) flood - flood damage caused approximately $700,000 in damage to public roads including the subdivided road in the new AVCP housing area.
- 2006 spring flood - flood damage to public roads, many homes causing approximately $750,000 in damage.

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

Location

The US Army Corps of Engineers has designated the Alakanuk area as a high flood hazard community. The entire community of Alakanuk is vulnerable to the effects of flooding. Conversations with residents indicate that flooding usually occurs during spring breakup and typically covers the entire community to a depth of 2 to 4 feet. High water marks were established at two locations by the USACOE based on the water level of the 1952 flood.

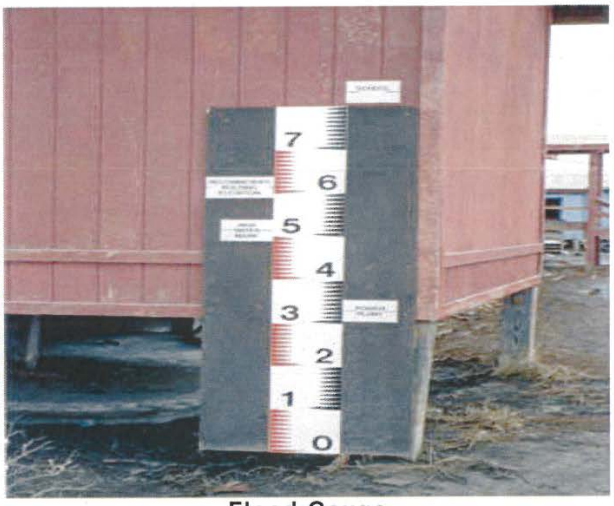
- The downstream shore side of the support piling of John Hanson's house (northwest corner).
- The utility pole downstream and inland approximately 100 yards southwest of John Hanson's house.

The estimated zero damage elevation is approximately 3 feet below the established high water mark at John Hanson's house. The recommended building elevation is 1 foot above the established high water level. Alakanuk passed an ordinance in 1993 that requires all future buildings to be constructed above the 1952 high water marks.

HWM #1(RP-1) Located on teh downstream, shoreside of the support piling of John Hanson's house (NW corner).

HWM #2(Rp-2) Located on the utility pole downstream and inland (approximately 100 yards SW) of John Hanson's house.

Flood Gauge Location



Flood Gauge

Extent

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

The following factors contribute to riverine flooding frequency and severity:

- Rainfall intensity and duration
- Watershed conditions, including terrain steepness, soil types, amount, vegetation type, and development density
- The landform features existence in the watershed, including swamps and lakes
- The flood control feature existence, such as levees and flood control channels
- Flow velocity
- Sediment for transport capability, and watercourse bed and embankment erodibility
- City location related to the base flood elevation as indicated with their certified high water mark

Residents report that flooding usually occurs during spring break up and typically covers the entire community to a depth of 2 to 4 feet.

Impact

Nationwide, floods result in more deaths than any other natural hazard. In addition, the physical damage attributed to flooding may include:

- 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

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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.

Damage attributed to flooding also creates excessive expenditures for emergency response, and generally disrupts the normal function of a community.

Alakanuk occupies a high flood hazard area, rated by the USACOE, Floodplain Management Branch. A high flood hazard rating, by definition, implies complete flooding of the area at least once for every five years' time. All residents, structures, and critical facilities in Alakanuk are vulnerable to flooding.

Impacts to the community are considered critical with the potential for injuries or illnesses resulting in permanent disability, complete shutdown of critical facilities for at least two weeks and more than 25% of property being severely damaged. In addition to the water damage, the spring floods carry large pieces of river ice than can cause significant structural damage to buildings. Many riverfront homeowners place log barriers between their houses and the river to protect them from floating ice.

Other problems related to flooding are deposition and stream bank erosion (erosion is discussed in detail in Section 5.3.2). Deposition is the accumulation of soil, silt, and other particles on a river bottom or delta. Deposition leads to the destruction of fish habitat, presents a challenge for navigational purposes, and prevents access to boat and barge landing areas. Deposition also reduces channel capacity, resulting in increased flooding and bank erosion. Erosion of the stream bank removes streamside vegetation, fish habitat, and property (BKP 1988).

Probability of Future Events

The USACE and NWS have provided data to support the community's view that there is a significant flood threat from riverine flood events. The Planning Team further stated the probability for flooding impacts recurring follows the probability of future damage resulting from river flooding is highly likely in the next calendar years (event has up to 1 in 1 years chance of occurring) as the history of events is greater than 33 percent likely per year (Alakanuk 2012).

5.3.4 Ground Failure

5.3.4.1 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 material prevents drainage. The surficial material 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 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.

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Human induced ground warming will often degrade permafrost much faster than natural degradation caused by a warming climate. Permafrost degradation may result from constructing warm structures on the ground surface allowing heat transfer to the underlying ground. Under this scenario, improperly designed and constructed buildings may settle as the ground subsides, resulting in loss of the structure or extensive 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.

5.3.4.2 History

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

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

Location

According to mapping completed by the Alaska Division of Geological and Geophysical Survey (DGGS), the entire City is underlain by discontinuous permafrost (Figure 5-4).

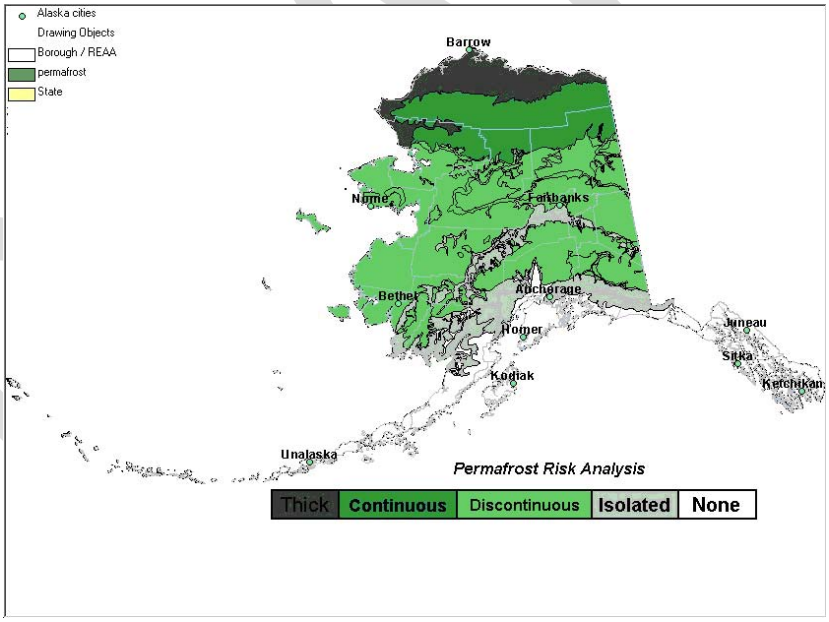

Figure 5-4 DGGS Permafrost Map of Alaska (DHS&EM 2007)

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 are considered negligible where injuries are treatable with first aid, minor impact to the quality of life, 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

Historical permafrost damage data does not exist for the City. However, the Planning Team noted that permafrost damage occurs annually to those structures and roads located adjacent to the City's wetlands. Referring to Table 5-2, the planning team estimated the probability of future damage resulting from permafrost greater than 10 percent but less than or equal to 20 percent likely per year.

5.3.5 Weather (Severe)

5.3.5.1 Nature

Severe weather occurs throughout Alaska with extremes experienced by the City of Alakanuk that includes thunderstorms, lightning, hail, heavy and drifting snow, freezing rain/ice storm, extreme cold, and high winds. The City experiences periodic severe weather events such as the following:

- **Heavy snow -** 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.
- **Drifting Snow -** Uneven distribution of snowfall and snow depth caused by strong surface winds. Drifting snow may occur during or after a snowfall.
- **Freezing rain and ice storms -** Occur when rain or drizzle freezes on surfaces, accumulating 12 inches in less than 24 hours. Ice accumulations can damage trees, utility poles, and communication towers which disrupts transportation, power, and communications.
- **Extreme cold -** Definition 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. Extreme cold accompanied by wind exacerbates exposure injuries such as frostbite and hypothermia.

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- **High winds -** Occur in Alaska when winter low-pressure systems are present 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 coastal areas along the Bering Sea and the Gulf of Alaska.
- **Strong winds -** Occasionally occur over the interior due to strong pressure differences, especially where influenced by mountainous terrain, but the windiest places in Alaska are generally along the coastlines (NWS 2011).

5.3.5.2 History

Western Alaska communities experience severe winter storm conditions annually.

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

Location

The City experiences periodic severe weather events. 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. The entire Alakanuk area is equally vulnerable to the effects of severe winter storm conditions.

Extent

The entire City is equally vulnerable to the effects of severe weather. Blizzard conditions and heavy snow depths for the area can reach 4.5" per storm event; wind speed can exceed 69 mph; and extreme low temperatures have reached -30ºF.

Based on past severe weather events the extent of severe weather in the City 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, generally more than 12 inches of accumulation in less than 24 hours, may immobilize a community by bringing transportation to a halt. Until the snow can be removed, airports and major roadways will be obstructed and may become unusable, stopping the flow of supplies and disrupting emergency services. Heavy snow accumulation may damage residential structures and critical infrastructure, such as power lines. Heavy snow loads can also damage light aircraft and capsize small boats. In addition, rapidly thawing snow may cause substantial flooding. The cost of snow removal, repairs to infrastructure, and loss of revenue may severely impact a community's economic resources.

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 may also interfere with a community's infrastructure and transportation system. Aircraft may be grounded due to extreme cold and ice fog conditions, isolating remote villages. Long cold spells may cause rivers to freeze; disrupting shipping and increasing the likelihood of

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ice jams and associated flooding. In remote communities, heating oil and electric generator fuel may congeal and become unusable. Without the ability to generate heat, people may become susceptible to frostbite or hypothermia, both life-threatening conditions. Supply lines, such as water pipes may also freeze and rupture.

Probability of Future Events

Based on previous occurrences, 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. All future residents, structures, and Critical Facilities in Alakanuk are at risk from the impacts of a severe winter storm.

5.3.6 Wildland Fire

5.3.6.1 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 also 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.

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5.3.6.2 History

Wildland fires have not been documented within the boundaries of Alakanuk. However, wildland fires have occurred in the surrounding vicinity and tundra.

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

Location

Under certain conditions tundra and wildland fires may occur in any area with fuel surrounding structures within Alakanuk. Since fuels data is not readily available, for the purposes of this plan, all outside structures and areas adjacent to City limits are considered to be vulnerable to tundra/wildland fire impacts. Over the past 50 years 35 significant fire events have occurred within 50 miles of Alakanuk (see Figure 4. Historic Wildland Fires near Alakanuk, Alaska).

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 lightning 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.

Impact

Impacts of a tundra/wildland fire that interfaces with the population center of the City could grow into an emergency or disaster if not properly controlled. An uncontrolled fire in a rural Alaska community can spread quickly and destroy everything in its path. Many communities in rural Alaska have literally burned away leaving the residents to move to an existing community and start over, or to rebuild in another location.

Based on past wildland fire events the magnitude and severity of impacts in the City of Alakanuk the probability of future fires is high with the potential for critical facilities to be shut down for more than 24 hours, more than 10 percent of property or critical infrastructure being severely damaged, and major permanent damage to transportation or infrastructure or the economy.

Indirect impacts of tundra/wildland fires can be catastrophic. In addition to stripping the land of vegetation and destroying other natural resources, 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 streams and water sources, thus increasing erosion 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 firefighters, public safety and welfare; natural and cultural resources

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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.

Based on the history of wildland fires in the Alakanuk area it is unlikely but possible a wildland fire event will occur in the next 10 years

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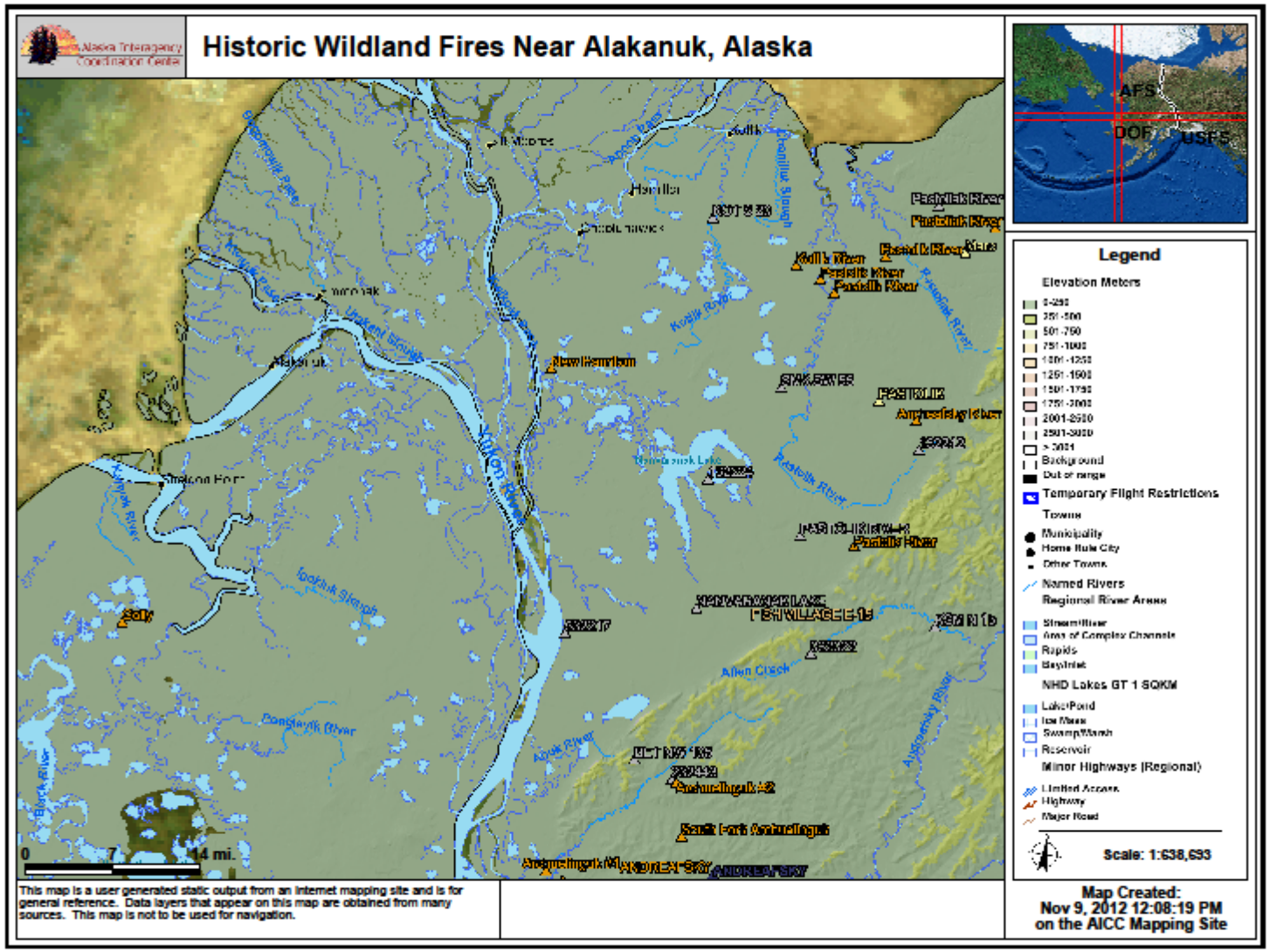
Alaska Interagency Coordination Center
Historic Wildland Fires Near Alakanuk, Alaska
AFS
DOF
USFS
Legend
Elevation Meters
Temporary Flight Restrictions
Towns
Municipality
Home Rule City
Other Towns
Named Rivers
Regional River Areas
Streamflow
Area of Complex Channels
Rapids
Bayline
NHD Lakes GT 1 SQKM
Lake/Pond
Ice Mass
Swamp/Marsh
Reservoir
Minor Highways (Regional)
Limited Access
Highway
Major Road
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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 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:

1. Asset Inventory
2. Methodology
3. Data Limitations
4. Exposure Analysis For Current Assets
5. Areas of Future Development

This section provides an overview of the vulnerability analysis for current assets, and area future development initiatives.

DMA 2000 Recommendations
Assessing Risk and Vulnerability, and Analyzing Development Trends §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. *All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods.* The plan should describe vulnerability in terms of: §201.6(c)(2)(ii)(A): The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; §201.6(c)(2)(ii)(B): An estimate of the potential dollar losses to vulnerable structures identified in … this section and a description of the methodology used to prepare the estimate. §201.6(c)(2)(ii)(C): 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. §201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning
1. Regulation Checklist
Element B. *Risk Assessment, Assessing Vulnerability, Analyzing Development Trends*
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))
B4. Does the Plan address NFIP insured structures within each jurisdiction that have been repetitively damaged by floods
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))
Source: FEMA, October 2011.

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.
- Identification of the types and numbers of RL properties in the identified hazard areas.
- 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.
- Estimate of potential dollar losses to vulnerable structures and the methodology used to prepare the estimate.

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 Alakanuk are identified and discussed in detail in the following sections.

6.2.1.1 Population and Building Stock

Population data for the City were obtained from the 2000 U.S. Census, the 2010 U.S. Census, and the /DCCED/DCRA community profile. The City's total population for 2000 was 652, 677 for 2010 and 2011 DCCED/DCRA data reported a population of 683(Table 6-1).

Table 6-1 Estimated Population and Building Inventory

Population			Residential Buildings	
2000 Census	2010 Census	2011 DCCED	Total Building Count	Total Value of Buildings[1]
652	677	683	190	$47,700,000

Sources: The City of Alakanuk, U.S. Census 2000, 2010 and 2011 DCCED/DCRA Certified population data.

Estimated replacement values for those structures, as shown in Table 6-1, were obtained from the 2000 U.S. Census, and DCCED/DCRA. A total of 138 single-family residential buildings were considered in this analysis. However the City stated that residential replacement values are generally understated as the cost for materials, shipping, and labor exceed the U.S. Census determined value.

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6.2.1.2 Repetitive Loss Properties

This section estimates the number and type of structures at risk to repetitive flooding.

DMA 2000 Requirements
Addressing Risk and Vulnerability to NFIP Insured Structures §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. *All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods.* The plan should describe vulnerability in terms of: §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 areas; §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; §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. §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.
1. Regulation Checklist
Element B. MFIP Insured Structures
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods?
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate?
Source: FEMA, October 2011

RL properties have had at least two $1,000 claims within any 10-year period since 1978.

SRL properties are most at risk for repeat flooding. These properties include every property that has experienced: four or more separate building and content claims since 1978 each exceeding $5,000 with cumulative claims exceeding $20,000; or at least two separate building claims with cumulative losses exceeding the value of the main living structure.

The City of Alakanuk does not participate in the NFIP nor do they have a repetitive flood property inventory that meets the RL or SRL criteria as the loss thresholds are substantially below FEMA values.

6.2.1.3 Existing Critical Facilities and Infrastructure

A critical facility is defined as providing essential products and services to the general public, such as preserving the quality of life in the City 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), and fire departments and firefighting 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. Alakanuk Critical Facilities

Facility Name	Facility Type	Latitude	Longitude
Airport - 18/36	Airport	62.68089	-164.65754
Church - Alakanuk Catholic Church	Church	62.68746	-164.66708
Church - Alakanuk Catholic Church Rectory	Church		
Church - Assembly of God Church	Church	62.69608	-164.677
Church - Assembly of God Parsonage	Church		
AVEC Connex Parts Storage	Community Storage Shed		
Corporation Garage	Community Storage Shed		
GRB (sp) Building	Community Storage Shed		
Warehouse 1	Community Storage Shed		
Warehouse 2	Community Storage Shed		
Warehouse 3	Community Storage Shed		
Fire Hall	Fire Station	62.68836	-164.66478
Fuel Storage 1	Fuel Storage Tanks (>500gal)	62.68474	-164.64995
Fuel Storage 2	Fuel StorageTanks (>500gal)	62.687	-164.62006
Fuel Storage 3	Fuel Storage Tanks (>500gal)	62.69353	-164.67464
Fuel Storage 4	Fuel Storage Tanks (>500gal)		
LYSD Generator/Warehouse Building	Generator		
Health Clinic	Hospital/Clinic/ER	62.68372	-164.65307
Landfill Class III Municipal	Landfill/Incinerator	62.68284	-164.64346
Armory 1	National Guard	62.684	-164.65526
Armory 2	National Guard		
April Aistrone Trailer	Offices		
City Office	Offices	62.68787	-164.66524
John Strongheart Trailer	Offices		
Native Corp Office	Offices	62.6876	-164.62022
Tribal Building	Offices		
Police Dept	Police Station	62.68799	-164.66574
Post Office	Post Office	62.69106	-164.67008
AVEC Connex 1	Power Generation Facility	62.68559	-164.66265

AVEC Connex 2	Power Generation Facility		
AVEC Power Plant	Power Generation Facility	62.68579	-164.66285
Generator Room 4	Power Generation Facility		
Headstart School	School	62.68433	-164.65287
LYSD Grade School	School	62.68421	-164.6516
LYSD High School	School	62.68429	-164.65063
LYSD Ramone Classroom	School	62.68404	-164.65224
City Shop	Service/Maintenance Shop	62.68809	-164.66551
LYSD - Shop	Service/Maintenance Shop		
LYSD Mechanical Building	Service/Maintenance Shop		
LYSD Truck Garage	Service/Maintenance Shop		
Public Shop	Service/Maintenance Shop		
Sewage Lagoon	Sewage Lagoon	62.6847	-164.65104
Alakanuk City Lodge	Store		
Alakanuk Deli	Store		
Annex Store	Store		
Jorgenson Warehouse	Store		
Jorgensons Store	Store	62.69161	-164.67121
Native Corp Store	Store	62.68752	-164.61969
LYSD Teachers Quarters	Teachers Quarters	62.68451	-164.65183
LYSD Trailer 1	Teachers Quarters		
LYSD Trailer 2	Teachers Quarters		
LYSD Trailer 3	Teachers Quarters		
LYSD Trailer 4	Teachers Quarters		
LYSD Trailer 5	Teachers Quarters		
LYSD Trailer 6	Teachers Quarters		
LYSD Trailer 7	Teachers Quarters		
LYSD Trailer 8	Teachers Quarters		
LYSD Triplex Housing	Teachers Quarters	62.68473	-164.64903
United Utilities Telephone	Telephone	62.68548	-164.64868
Washeteria/Sauna	Washeteria	62.6847	-164.65104
Water Sewer Plant	Waste Water Treatment Facility		

6.2.1.4 Future Critical Facilities and Infrastructure

Alakanuk is situated along the banks of Alakanuk Pass, from its confluence with the Yukon River and westward approximately 2.5 miles. The majority of the housing units and commercial and industrial properties are located on the southern bank of the Pass, although several residential houses, a store, and the closed cannery are located on the northern bank. Most of the developed areas are north of Anderson Road.

Assuming the average growth trend over the past twenty years continues, the population of Alakanuk should continue to grow at a modest rate of approximately 1.3% annually. According to the 2012 asset data inventory by the Alakanuk planning team, there were 186 residential housing units. Several homes have been moved or are in danger of being destroyed because of erosion problems caused by Alakanuk Pass. The Department of Housing and Urban

Development constructed 21 new housing units on the south side of Anderson Road during the summer of 1993.

The area surrounding Alakanuk is designated as the Yukon Delta National Wildlife refuge, and is primarily wetlands. There are no adequate sources of construction borrow materials nearby, and any new road construction would probably require importing borrow material from upriver at a significant expense. Many of the areas along the existing roads are not currently developed. Because of the expense of constructing new roads, it is expected that any new housing development would be placed along existing roads.

Ownership of lands in the project area is generally divided between private individuals or businesses, the Calista Native Corporation, and government entities. Private or public property transfers subsequent to the original transfer from the federal government may not necessarily be recorded with the BLM, and would not have been discovered in our research. The City firmly stated they will no longer allow future buildings construction in known hazard areas.

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.

The methodology used a two pronged effort. First, The Planning Team used the State's Critical Facility Inventory and locally obtained GPS coordinate data to identify critical facility locations in relation to potential hazard's threat exposure and vulnerability. Second, this data was used to develop a vulnerability assessment for those hazards where GIS based hazard mapping information was available.

Replacement structure and contents values were developed for physical assets. These value estimates were provided by the Planning Team. 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 estimated. 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 a risk approximation. 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

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facility/system function, and economic losses). Such impacts may be addressed with future updates of the HMP.

6.2.4 Exposure Analysis

There is limited GIS data available for the City of Alakanuk. The City's descriptive analysis for earthquake, erosion, flood, ground failure, severe weather; and exposure analysis for tundra wildland fire loss estimations are summarized in Tables 6-3.

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Table 6-3. Vulnerability Assessment – Population, Residential Structures, and Critical Facilities

		Residential Structures				Critical Facilities				Total		
Hazard	Population	Number	Structure Value	Contents Value	Total Value	Number	Structure Value	Contents Value	Value	Structure Value	Contents Value	Value
Earthquake	678	138	$ 13,223,000.00	$ 6,611,500.00	$ 19,834,500.00	61	$ 34,521,624.00	$ 29,186,936.00	$ 63,708,560.00	$ 47,744,624.00	$ 35,798,436.00	$ 83,543,060.00
Erosion	58	14	$ 760,000.00	$ 1,520,000.00	$ 2,280,000.00	1	$ 120,000.00	$ 180,000.00	$ 300,000.00	$ 880,000.00	$ 1,700,000.00	$ 2,580,000.00
Flooding	678	138	$ 13,223,000.00	$ 6,611,500.00	$ 19,834,500.00	61	$ 34,521,624.00	$ 29,186,936.00	$ 63,708,560.00	$ 47,744,624.00	$ 35,798,436.00	$ 83,543,060.00
Severe Winter Storm	678	138	$ 13,223,000.00	$ 6,611,500.00	$ 19,834,500.00	61	$ 34,521,624.00	$ 29,186,936.00	$ 63,708,560.00	$ 47,744,624.00	$ 35,798,436.00	$ 83,543,060.00
Wildfire	678	138	$ 13,223,000.00	$ 6,611,500.00	$ 19,834,500.00	61	$ 34,521,624.00	$ 29,186,936.00	$ 63,708,560.00	$ 47,744,624.00	$ 35,798,436.00	$ 83,543,060.00

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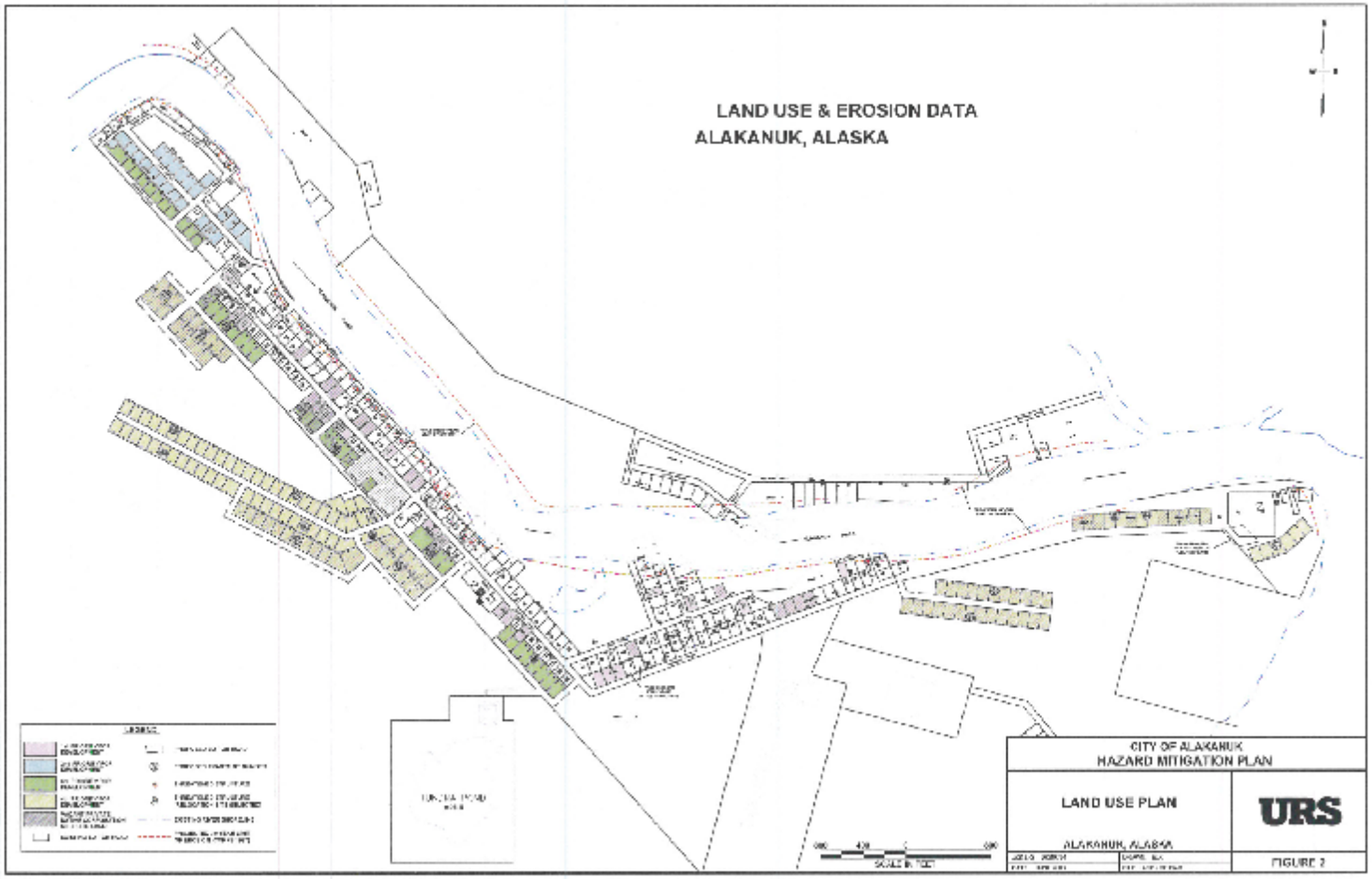
6.3 LAND USE AND DEVELOPMENT TRENDS

Land use in the City is predominately residential with limited area for commercial services and community (or institutional) facilities. Suitable developable vacant land is in short supply within the boundaries of the City, and open space and various hydrological bodies surround the community. One area of town is classified as airport land use.

Development Trends

The City's Comprehensive Strategic Development Plan known as the LEDP realistically describes their local community develop trends (stating both positive as well as negative aspects) to enable them to accurately assess their mitigation situation. Their environmental needs include:

- "***Positive***:
  - *Understand how military hazardous materials affect the environment and effect health/cancer related deaths. Work with statewide organizations such as the Alaska Center for Appropriate Technology (ACAT), Department of Environmental Conservation (DEC), and the Environmental Protection Agency (EPA) to address these issues*
  - *More local people are getting involved with addressing sensitive community issues such as environmental impacts*
- ***Negative***:
  - *The environment continues to change*
  - *Foreign debris washing up on the shore and beach their effects to marine mammals, sea life, and subsistence impacts (drift or trawl nets , other Bering Sea pollutants and toxic waste)*
  - *Dump/landfill is full and has reached useful life*
  - *Island experiences severe storms, wind, and cold*
  - *Island is too far from mainland –remoteness requires supply delivery by plane or barge*
  - *Increasing freight costs*
  - *Island shoreline erosion*
- ***Strengths***:
  - *Consistent wind creates a potential for electricity generation*
  - *Island has good gravel and rock resources*
  - *Community has strong traditional knowledge (environment-changes, event history, understanding, and recognition)*


LAND USE & EROSION DATA
ALAKANUK, ALASKA
CITY OF ALAKANUK
HAZARD MITIGATION PLAN
LAND USE PLAN
ALAKANUK, ALASKA
URS
FIGURE 2

City of Alakanuk
HMGP 1423.0003
Relocation and Elevation of Nine Structures Project
GPS Locations

Site Name	GPS Old	GPS New
Alakanuk City Office	N 62.41229 W 164.40041	
Lawrence Edmond	N 62.69014 W 164.67200	N 62.68918 W 164.67416
Cecelia Tucker	N 62.68567 W 164.64310	N 62.68346 W 164.66278
Paul Tony	N 62.68949 W 164.76076	N 62.68760 W 164.67107
Mary Andrews	N 62.68830 W 164.66843	N 62.69302 W 164.67932
John Kameroff	N 62.68843 W 164.66884	N 62.69562 W 164.68155
Mary Williams	N 62.68988 W 164.67145	N 62.68974 W 164.67181
Sophie & Leon Joseph	N 62.69164 W 164.67474	N 62.69151 W 164.67500
Joe Joseph Jr.	N 62.69190 W 164.67532	N 62.69176 W 164.67540

Tables 6-4 and 6-5 list DCRA's identified infrastructure improvement projects for the City. They provide a depiction of the community's ongoing development trends and focus on improving aging infrastructure. Table 6-4 lists projects in various stages of completion:

Table 6-4 Planned and Funded Projects

Lead Agency	Fiscal Year	Project Status	Project Description/Comments	Project Stage	Total Cost
DEED	2011	funded	K-12 School Replacement legislative - K-12 School Replacement; GO Bonds, election Nov 2010.	preliminary	$46,500,000
DOT&PF	2010	Funded	Airport Relocation, Phase 4 Multi-staged relocation project. Apply surface material, re-grade runway, apron, taxiway and access road. Install airport lighting on the 4,000 foot long silt embankment runway. Complete other improvements as funding allows.	Preliminary	$0
DOT&PF	2010	Funded	Snow Removal Equipment Building Construct a snow removal equipment building at the new Alakanuk Airport.	Preliminary	$0
Denali	2010	Funded	Alakanuk Community Streets Rehabilitation Design Project Design Phase for reconstruction of 2.3 miles of community streets to widen to 20 feet. Design will include investigation of an appropriate dust control palliative application.	Design	$216,000
DOT&PF	2009	Funded	Airport Relocation Legislative Grant	Preliminary	$0
HUD	2009	Funded	Indian Housing Block Grant NAHASDA administration, operating & construction funds	Contract	$391,081
DOT&PF	2008	Funded	Airport Relocation Legislative Grant	Completed	$2,467,500
HUD	2008	Funded	Indian Housing Block Grant NAHASDA administration, operating & construction funds	Design	$346,159
FAA	2007	Funded	Construct New Airport Phase 2 (Surfacing & SREB) OTHER FUNDING: AKDOT/PF	Construction	$6,574,722
HUD	2007	Funded	Indian Housing Block Grant NAHASDA administration, operating & construction funds	Construction	$400,754

Several agencies provide assistance to Alaska's communities to enable them to fulfill or maintain health, education, housing, and transportation needs. Table 6-5 lists DCRA identified completed projects for the City.

Table 6-5 Completed Projects

Lead Agency	Fiscal Year	Project Status	Project Description/Comments	Project Stage	Total Cost
Denali	2006	Funded	Community Multi-Use Facility	Project Close-out Complete	$20,000
HUD	2006	Funded	Indian Housing Block Grant NAHASDA administration, operating & construction funds	Completed	$396,669
HUD	2005	Funded	Indian Housing Block Grant NAHASDA administration, operating & construction funds	Completed	$424,998
AHFC	2004	Funded	6 SF units Supplemental Housing Program	Completed	$195,600
HUD	2004	Funded	Indian Housing Block Grant NAHASDA administration, operating & construction funds	Completed	$455,764
DCRA	2003	Funded	Community Projects & Improvements Capital Matching	Completed	$25,000
HUD	2003	Funded	Indian Housing Block Grant NAHASDA administration, operating & construction funds	Completed	$509,692
ANTHC	2002	Funded	Site improvements for a YKHC constructed health clinic. Please see the Denali Commission web site for details on clinic construction. This project is managed by the Yukon Kuskokwim Health Corporation.	Complete	$65,480
DCRA	2002	Funded	Purchase Refuse Pickup Truck Capital Matching	Completed	$25,000
DEED	2002	Funded	School Mechanical System Upgrade	Construction	$899,740
FAA	2002	Funded	Airport Reconstruction/Relocation, Phase I OTHER FUNDING: AKDOT/PF	Completed	$5,596,264
HUD	2002	Funded	Indian Housing Block Grant NAHASDA administration, operating & construction funds	Completed	$451,509

Table 6-5 Completed Projects

Lead Agency	Fiscal Year	Project Status	Project Description/Comments	Project Stage	Total Cost
DCRA	2001	Funded	Equipment Purchase (Front End Loader) Capital Matching	Completed	$25,000
DEC/VSW	2001	Funded	Water and Sewer expansion/20 new homes USDA/RD $397.5. Hook up 20 homes to existing water and sewer main.	Completed	$132,500
DEC/VSW	2001	Funded	Sanitation Feasibility Study-Service Area 7 OTHER FUNDING: EPA/IG - 2000 - $45,000. Feasibility study for Area 7, across river from downtown	Completed	$15,000
Denali	2001	Funded	Clinic Design The scope of work for this project is site improvement/ renovation of the existing healthcare clinic. Community has population of 678 and project was awarded under 0071-DC-2002-I24 in April of 2002. Units of measure would be cubic yards of gravel or hours of labor.	Project Close-out Complete	$65,480
Denali	2001	Funded	Bulk Fuel Facility This upgrade incorporates three separate sites to meet the needs of the community. A co-located site, situated west of the existing AVEC power plant, will provide bulk storage capacity for AVEC, LYSD, the City of Alakanuk, Alakanuk Native Corporation, Lower Yukon School District, and the Ahlstrom Family. Total anticipated storage capacity will be 485,000 gallons of diesel fuel and gasoline.	Project Close-out Complete	$34,966
DCRA	2000	Funded	Equipment Purchase (Front End Loader) Capital Matching. Local priority, from 1997 USDA/RD survey of villages	Completed	$25,000
HUD	2000	Funded	Indian Housing Block Grant NAHASDA administration, operating & construction funds	Completed	$418,341
AHFC	1999	Funded	Mutual help housing, 9 low income units HUD NAHASDA	Completed	$142,560
DCRA	1999	Funded	Erosion and Relocation project Capital Matching	Completed	$25,000

Table 6-5 Completed Projects

Lead Agency	Fiscal Year	Project Status	Project Description/Comments	Project Stage	Total Cost
DEC/VSW	1999	Funded	Piped Water and Sewer USDA/RD $1,050,000.. Finish Service Areas 2, 3 & 4; construct water and sewer in Service Area 6; Sauna Rehab.	Completed	$1,050,000
HUD	1999	Funded	Indian Housing Block Grant NAHASDA administration, operating & construction funds	Completed	$418,341
USDA/RD	1999	Funded	Piped Water & Sewer, Ph. IV DEC VSW lead. Total project $12.5 million. Est. completion in 2000	Completed	$1,050,000
DCRA	1998	Funded	Street & Site Improvements CDBG	Completed	$199,805
DCRA	1998	Funded	Erosion Control and Relocation of Buildings Capital Matching	Completed	$25,000
HUD	1998	Funded	Health Clinic ICDBG Program	Completed	$497,135
HUD	1998	Funded	Indian Housing Block Grant NAHASDA administration, operating & construction funds	Completed	$436,112
DCRA	1997	Funded	Public Safety Building and Equipment Capital Matching	Completed	$25,000
DEC/VSW	1997	Funded	Piped Water Project OTHER FUNDING: EPA/IG - 1997 - $1,100,000. Central facilities completed. Hook up remaining 70 homes downriver in service areas 2 & 3	Completed	$1,100,000
HUD/CGP	1997	Funded	Housing Modernization Fire escapes, interiors, ventilation	Completed	$385,304
DCRA	1996	Funded	Erosion/Relocation Design CDBG	Completed	$54,000
DCRA	1996	Funded	Erosion Mitigation Plan Capital Matching	Completed	$25,000

Table 6-5 Completed Projects

Lead Agency	Fiscal Year	Project Status	Project Description/Comments	Project Stage	Total Cost
DEC/VSW	1996	Funded	Design and Construct Water and Sewer, Ph. II OTHER FUNDING: EPA/IG - 1996 - $1,100,000. Finish design Phase II; construct piped water and sewer in Service Area 5; construct water storage tank near utility building	Completed	$1,100,000
DEC/VSW	1996	Funded	Water and Sewer OTHER FUNDING: EPA/IG - 1995 - $400,000. Construct piped water and sewer in Service Area 1; construct sewage lagoon	Completed	$1,100,000
DOT&PF	1996	Funded	Rehab Airport Snow Removal Equipment Bldg. FAA	Completed	$7,133
FAA	1996	Funded	Airport Master Plan	Completed	$295,925
DCRA	1995	Funded	Erosion Control Capital Matching	Completed	$25,000
DCRA	1995	Funded	Hotel/Restaurant Design RDA/USFS Mini-Grant	Completed	$15,000
DEC/VSW	1995	Funded	Sanitation Facilities Design and Construction Construct utility building including water treatment plant and vacuum sewer station	Completed	$1,000,000
DOT&PF	1995	Funded	Airport Loader	Completed	$11,600
HUD/CGP	1995	Funded	Housing Modernization Exteriors	Completed	$275,000
DCRA	1994	Funded	Fire Station/Equipment Upgrade Legislative Grant	Completed	$60,000
DCRA	1994	Funded	Police Vehicle Purchase & Delivery Capital Matching	Completed	$25,000
DEC/VSW	1994	Funded	Water and Sewer Design Phase II; construct water treatment plant improvements	Completed	$500,000
USDA/RD	1994	Funded	Piped Water & Sewer	Completed	$1,000,000
DCRA	1993	Funded	Road Improvements/Washeteria Legislative Grant	Completed	$80,000
DEC/VSW	1993	Funded	Water and Sewer Master Planning and	Completed	$500,000

Table 6-5 Completed Projects

Lead Agency	Fiscal Year	Project Status	Project Description/Comments	Project Stage	Total Cost
			Design Complete Master Plan and complete design of Phase I piped water and sewer system		
HUD/CGP	1993	Funded	Housing Modernization Renovate 2 HUD housing units to meet handicapped needs, replace fuel oil tanks in 25 units. 2 projects	Completed	$70,000
DEC/VSW	1992	Funded	Honeybucket Haul Complete Individual Honeybucket Pits, Design Ph. I	Completed	$305,000
DOT&PF	1992	Funded	Airport Improvements Ph. I	Completed	$270,144
HUD/AHFC	1991	Funded	Construct 21 Housing Units	Completed	$2,420,320

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This section outlines the four-step process for preparing a mitigation strategy including:

1. Developing Mitigation Goals
2. Identifying Mitigation Actions
3. Evaluating Mitigation Actions
4. Implementing Mitigation Action Plans

Within this section the Planning Team developed the mitigation goals and potential mitigation actions for the City of Alakanuk.

7.1 DEVELOPING MITIGATION GOALS

DMA 2000 requirements and regulations for mitigation strategy are described below.

DMA 2000 Requirements
Local Hazard Mitigation Goals §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 C. Mitigation Goals
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards?
Source: FEMA, October 2011

The exposure analysis results were used as a basis for developing the mitigation goals and actions. Mitigation goals are defined as general guidelines describing the results a community desires in terms of hazard and loss prevention. Goal statements are typically long-range, policy-oriented statements representing community-wide visions. As such, nine 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	Reduce possibility of damage and losses from erosion
2	Promote erosion prevention education
3	Reduce the possibility of damage and losses from flooding
4	Promote recognition of wildland fire and preparation for impacts from wildland fire
5	Reduce possibility of damage and losses from wildland fires
6	Reduce vulnerability of structures to earthquake damage
7	Promote public education regarding earthquake hazards
8	Promote public access to severe weather emergency advisory information
9	Promote public education regarding severe winter storm hazards
10	Reduce vulnerability of structures to severe winter storm damage

7.2 IDENTIFYING MITIGATION ACTIONS

DMA 2000 requirements and regulations for mitigation analysis are described below.

DMA 2000 Requirements
Identification and Analysis of Mitigation Actions §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 C. Mitigation Actions
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure?
Source: FEMA, October 2011.

After mitigation goals and actions were developed, the planning team assessed the potential mitigation actions to carry forward into 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 three broad categories: property protection, public education and awareness, and structural projects. The Project Team considered 30 potential mitigation actions for implementation and selected mitigation actions for potential implantation during the five-year life cycle of this HMP update. The Project Team placed particular emphasis on projects and programs that reduce the effects of hazards on both new and existing buildings and infrastructure. These potential projects are listed in Table 7-2 below.

Table 7-2. Potential Mitigation Actions

Hazard	Goal	Objective	Action/Project	Potential Funding Source	Duration (long/short)	Rank	Potential Participants
Erosion	Reduce possibility of damage and losses from erosion	Identify buildings that are at risk of impact from erosion	1 - Update Erosion hazard mapping	PDM, HMGP Grants Program	Short-term		City Council
			2 - Relocate buildings that are at risk of being affected by erosion	PDM, HMGP, Department of Homeland Security Preparedness Technical Assistance Program	Short-term		
		Work with agencies, Native corporations, and organizations to identify new and emerging riverbank protection methods and grants (or other type of funding mechanism) that are available for these strategies	3 - Apply for grants/funds to implement riverbank protection methods	PDM and HMGP grants	Long-term		City Council, Alakanuk Native Corporation, Village of Alakanuk
	Promote erosion prevention education	Research information regarding riverbank erosion problems, prevention, and mitigation	4 - Hold a series of community meetings to provide information to residents	PDM, Lindbergh Grants Program	Short-term		City Council, Alakanuk Native Corporation, Village of Alakanuk
			5 - Provide information on riverbank erosion and ways to halt and prevent it in a format that can be distributed to all residents	PDM, Lindbergh Grants Program	Short-term		City Council, LYSD
Flooding	Reduce the possibility of damage and losses from flooding	Adopt and enforce floodplain management ordinances	1 - Join the National Flood Insurance Program, which regulates development in floodplains and provides federally-backed insurance to individuals who live in communities that have joined the program	None needed	Short-term		City Council
		Identify and assess repetitively flooded properties	3 - Relocate, acquire, elevate, or otherwise flood-proof identified properties	PDM, HMGP, FMA, Lindbergh Grants Program	Short-term		City Council
			2 - Relocate, acquire, elevate, or otherwise flood-proof critical facilities	PDM, HMGP, FMA, Lindbergh Grants Program	Short-term		

Table 7-2. Potential Mitigation Actions

Hazard	Goal	Objective	Action/Project	Potential Funding Source	Duration (long/short)	Rank	Potential Participants
			4 - Complete a detailed inventory of community structures and infrastructure, including all critical facilities that are susceptible to flooding in GIS	PDM, HMGP Grants Program	Short-term		
		Enhance warning and response activities to increase warning time for the community	5 - Install new streamflow and rainfall measuring gauges	PDM, HMGP Grants Program	Short-term		City Council, State of Alaska, USGS
Flooding (continued)	See above	See above	6 - Develop "real-time" internet access and interagency cooperation to speed flood warning times	PDM, HMGP Grants Program	Long-term		See above
Wildfire	Promote recognition of wildland fire and preparation for impacts from wildland fire	Identify impacts that can result from excessive wildland fire smoke and the ways to guard yourself against those impacts	1 - Provide information in a format that can be distributed to residents	PDM, Lindbergh Grants Program, HMGP, AFG Program's Fire Prevention and Safety Grant	Short-term		LYSD
	Reduce possibility of damage and losses from wildland fires	Identify methods of alerting the community if wildfire threat develops	2 - Schedule and perform "fire drills" at least twice per year	PDM, Lindbergh Grants Program, HMGP, AFG Program's Fire Prevention and Safety Grant	Long-term		City Council, Alakanuk Native Corporation, Village of Alakanuk, State Fire Marshall
		Develop an evacuation plan for the community			Long-term		
		Maintain Project Code Red Equipment			Long-term		
		Promote FireWise building design, siting, and materials for construction	3 - Develop a workshop for builders	PDM, Lindbergh Grants Program, HMGP, AFG Program's Fire Prevention and Safety Grant	Long-term		City Council
			4 - Retrofit structures with FireWise building design materials	PDM, Lindbergh Grants Program, HMGP, AFG Program's Fire Prevention and Safety Grant	Long-term		

Table 7-2. Potential Mitigation Actions

Hazard	Goal	Objective	Action/Project	Potential Funding Source	Duration (long/short)	Rank	Potential Participants
Wildfire (continued)	Promote recognition of wildland fire and preparation for impacts from wildland fire	Identify impacts that can result from excessive wildland fire smoke and the ways to guard yourself against those impacts	1 - Provide information in a format that can be distributed to residents	PDM, Lindbergh Grants Program, HMGP, AFG Program's Fire Prevention and Safety Grant	Short-term		LYSD
	Reduce possibility of damage and losses from wildland fires	Identify methods of alerting the community if wildfire threat develops	2 - Schedule and perform "fire drills" at least twice per year	PDM, Lindbergh Grants Program, HMGP, AFG Program's Fire Prevention and Safety Grant	Long-term		City Council, Alakanuk Native Corporation, Village of Alakanuk, State Fire Marshall
		Develop an evacuation plan for the community			Long-term		
		Maintain Project Code Red Equipment			Long-term		
		Promote FireWise building design, siting, and materials for construction	3 - Develop a workshop for builders	PDM, Lindbergh Grants Program, HMGP, AFG Program's Fire Prevention and Safety Grant	Long-term		City Council
			4 - Retrofit structures with FireWise building design materials	PDM, Lindbergh Grants Program, HMGP, AFG Program's Fire Prevention and Safety Grant	Long-term		
		Support training for volunteers on the on fire department	5 - Send at least two volunteer fire department members to the Code Red equipment training, rural basic firefighter certification, or basic incident command system knowledge	PDM, Lindbergh Grants Program, HMGP, AFG Program's Fire Prevention and Safety Grant	Long-term		Alakanuk Native Corporation, Village of Alakanuk, State Fire Marshall
		Identify funding sources for training			Short-term		
Earthquake	Reduce vulnerability of structures to earthquake damage	Encourage use of earthquake resistant materials and construction practices	1 - Implement Uniform International and State Building Codes	PDM, Lindbergh Grants Program	Short-term		City Council
		Ensure that all future development meets all requirements for seismic protection	2 - Inspect or have certified all new construction	PDM, Lindbergh Grants Program	Long-term		City Council
		Educate community about ways to mitigate damages	4 - Hold workshop to identify household mitigation measures	PDM, Lindbergh Grants Program	Short-term		City Council
Severe Winter Storm	Promote public access to severe weather emergency advisory information	Provide access to a current weather watch and advisory information	1 - Purchase NOAA radios and develop web portal (NWS, FEMA, The Weather Channel)	PDM, Lindbergh Grants Program	Short-term		City Council, Alakanuk Native Corporation, Village of Alakanuk

Table 7-2. Potential Mitigation Actions

Hazard	Goal	Objective	Action/Project	Potential Funding Source	Duration (long/short)	Rank	Potential Participants
Severe Winter Storm (continued)	Promote public access to severe weather emergency advisory information Promote public education regarding severe winter storm hazards	Investigate emergency broadcast capabilities in western Alaska	2 - Contact NOAA and request NWS station installation in Alakanuk (or similar western Alaska community to provide coverage between Bethel and Nome)	PDM, Lindbergh Grants Program	Long-term		City Council, Alakanuk Native Corporation, Village of Alakanuk
		Investigate opportunities to participate in National Warning System to receive weather warning information from the National Weather Service	3 - Send at least two volunteers to NWS storm spotter training	PDM, Lindbergh Grants Program	Short-term		City Council
		Obtain more accurate flood warning information	4 - Install new streamflow and rainfall measuring gauges	HMGP, PDM Grants	Long-term		City Council
		Participate in winter weather awareness week and flood awareness week	5 - Develop workshop at school and have students display mitigation projects	PDM, Lindbergh Grants Program	Short-term		City Council, LYSD
	Promote public education regarding severe winter storm hazards Reduce vulnerability of structures to severe winter storm damage	Conduct community alert tests for NOAA warning tones	6 - Contact NOAA, City Police and Fire Departments, and Volunteer Fire Department and to coordinate test	PDM, Lindbergh Grants Program	Short-term		City Council, Alakanuk Native Corporation, Village of Alakanuk, NOAA
		Encourage use of weather resistant materials and construction practices	7 - Implement Uniform International and State Building Codes	PDM, Lindbergh Grants Program	Short-term		City Council

7.3 EVALUATING AND PRIORITIZING MITIGATION ACTIONS

DMA 2000 requirements for implementation of mitigation actions are described below.

DMA 2000 Requirements: Mitigation Strategy – Implementation of Mitigation Actions
Implementation of Mitigation Actions §201.6(c)(3)(iii): [The hazard mitigation strategy shall include an] action plan, describing how the action identified in paragraph (c)(3)(ii) of this section 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 C. Mitigation Strategy
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))
Source: FEMA, October 2011

The planning team evaluated and ranked each mitigation action to determine which actions would best help the community fulfill its mitigation goals. To complete this task, the planning team members reviewed the Capability Assessment and applied simplified Social, Technical, Administrative, Political, Legal, Economic and Environmental (STAPLEE) evaluation criteria (shown below) to consider the opportunities and constraints of implementing a particular mitigation action. A detailed cost benefit analysis has been completed for some of the relocation and elevation projects selected for implementation by the City. The need for a cost-benefit analysis was discussed during prioritization in a public forum for all mitigation actions and is summarized in Table 7-3 for those mitigation actions considered the highest priority by the community.

Table 7-3 Evaluation Criteria for Mitigation Actions

Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE)

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 City of Alakanuk 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 feels about issues related to the environment, economic development, safety and emergency management.	Political support Local champion Public support
Legal	Whether the City of Alakanuk has the legal authority to implement the action, or whether they must pass new laws and regulations.	Local, State, and Federal authority Potential legal challenge
Economic	If the action can be funded with current or future internal and external sources of funding, if the costs seem reasonable for the size of the project, and if enough information is available to complete a FEMA Benefit-Cost Analysis (See Attachment B).	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 sustainable and environmentally healthy communities.	Effect on local flora and fauna Consistent with community environmental goals Consistent with local, state, and Federal laws

The results of this evaluation and ranking process of a “positive” or “neutral” ranking are shown below.

Table 7-3.1. Mitigation Action Ranking Scores

Goals		Number	Rank	Action / Project
1	Reduce possibility of damage and losses from erosion	1.1	N	1 - Update Erosion hazard mapping
		1.2	P	2 - Relocate buildings that are at risk of being affected by erosion
		1.3	P	3 - Apply for grants/funds to implement riverbank protection methods
2	Promote erosion prevention education	2.4	N	4 - Hold a series of community meetings to provide information to residents
		2.5	N	5 - Provide information on riverbank erosion and ways to halt and prevent it in a format that can be distributed to all residents
3	Reduce the possibility of damage and losses from flooding	3.1	N	1 - Join the National Flood Insurance Program, which regulates development in floodplains and provides federally-backed insurance to individuals who live in communities that have joined the program
		3.3	P	3 - Relocate, acquire, elevate, or otherwise flood-proof identified properties
		3.2	P	2 - Relocate, acquire, elevate, or otherwise flood-proof critical facilities
		3.4	N	4 - Complete a detailed inventory of community structures and infrastructure, including all critical facilities that are susceptible to flooding in GIS
		3.5	N	5 - Install new streamflow and rainfall measuring gauges
		3.6	N	6 - Develop “real-time” internet access and interagency cooperation to speed flood warning times
4	Promote recognition of wildland fire and preparation for impacts from wildland fire	4.1	N	1 - Provide information in a format that can be distributed to residents
5	Reduce possibility of damage and losses from wildland fires	5.2	N	2 - Schedule and perform “fire drills” at least twice per year
		5.3	N	3 - Develop a workshop for builders
		5.4	N	4 - Retrofit structures with FireWise building design materials

Table 7-3.1. Mitigation Action Ranking Scores

Goals		Number	Rank	Action / Project
		5.5	N	5 - Send at least two volunteer fire department members to the Code Red equipment training, rural basic firefighter certification, or basic incident command system knowledge
6	Reduce vulnerability of structures to earthquake damage	6.1	N	1 - Implement Uniform International and State Building Codes
		6.2	N	2 - Inspect or have certified all new construction
7	Promote public education regarding earthquake hazards	7.3	N	3 - Train earthquake safety and hold drills at schools
		7.4	N	4 - Hold workshop to identify household mitigation measures
8	Promote public access to severe weather emergency advisory information	8.1	N	1 - Purchase NOAA radios and develop web portal (NWS, FEMA, The Weather Channel)
		8.2	N	2 - Contact NOAA and request NWS station installation in Alakanuk (or similar western Alaska community to provide coverage between Bethel and Nome)
		8.3	N	3 - Send at least two volunteers to NWS storm spotter training
		8.4	N	4 - Install new streamflow and rainfall measuring gauges
9	Promote public education regarding severe winter storm hazards	9.5	N	5 - Develop workshop at school and have students display mitigation projects
		9.6	N	6 - Contact NOAA, City Police and Fire Departments, and Volunteer Fire Department and to coordinate test
10	Reduce vulnerability of structures to severe winter storm damage	10.7	N	7 - Implement Uniform International and State Building Codes

7.4 IMPLEMENTING A MITIGATION ACTION PLAN

Once mitigation actions were ranked, members of the planning team and Alakanuk City residents reviewed the entire list, and voted on the most effective mitigation action to include in the mitigation action plan. The outcome of this voting process yielded two mitigation actions. The ranking, how each mitigation action will be implemented and administered (including which departments or agencies will be responsible for implementation), existing and potential funding sources, overall cost benefits and time frame are outlined below.

Table 7-4. Mitigation Action Plan

1.2	Action Item	Relocate buildings that are at risk of being affected by erosion
	Ranking	Positive
	Department / Agency	City Council
	Potential Funding Source	Department of Homeland Security Preparedness Technical Assistance Program, PDM grants
	Implementation Timeline	1-3 years
	Benefit-Costs	This mitigation action addresses high risk situations – it is imperative that at risk buildings (both residences and critical facilities) can function during and after a disaster.
1.3	Action Item	Apply for grants/funds to implement riverbank protection methods
	Ranking	Positive
	Department / Agency	City Council, Alakanuk Native Corporation, Village of Alakanuk
	Potential Funding Source	Department of Homeland Security Preparedness Technical Assistance Program, HMGP, and PDM grants
	Implementation Timeline	1–2 years
	Benefit-Costs	This mitigation action is low cost, but has the potential to prevent, curb, and mitigate future development in hazard prone areas.

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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's 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

Described below are the requirements for monitoring, evaluating, and updating the HMP, as stipulated in the DMA 2000.

DMA 2000 Requirements
Monitoring, Evaluating and Updating the Plan §201.6(c)(4)(i): The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process
1. Regulation Checklist
Element A. Planning Process (Continued)
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle?)
Source: FEMA, October 2011

Plan Last Updated On: 20 November, 2012

The Alakanuk Hazard Mitigation Plan was prepared as a collaborative effort among the planning team. To maintain momentum and build upon this hazard mitigation planning effort, the City of Alakanuk will use the planning team to monitor, evaluate and update the plan. In addition to the original members of the planning team, other interested parties may participate in this process. Hilda Stern (Planning Team Leader) will serve as the primary point of contact and will coordinate all local efforts to monitor, evaluate and revise the plan. Additionally the position of City Manager will serve as the primary point of contact when there is a change of personnel

The planning team will conduct an annual review to monitor progress in implementing the plan, particularly the Mitigation Action Plan. As shown on the attached annual review form (Attachment C), the annual review will provide the basis for possible changes in the Mitigation Action Plan by focusing on new or more threatening hazards, adjusting to fluctuations in resource allocations, and engaging additional support for the plan implementation. The planning team leader will initiate an annual review by questionnaire 1 month prior to the adoption month.

The planning team leader will collect the questionnaire and summarize the results into an annual report. This report will be distributed to all planning team members, City Council members and other interested agencies, departments and persons.

In addition to the annual review, the Planning Team will update the HMP every five years. The following section explains how the HMP will be reviewed, evaluated, and implementation successes described.

DMA 2000 Requirements
Reviewing, Evaluating, and Implementing the Plan §201.6(d)(3): A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit if for approval within 5 years in order to continue to be eligible for mitigation project grant funding.
Element D. Planning Process (Continued) *Update activities not applicable to the plan version*
D1. Was the Plan revised to reflect changes in development? (Requirement §201.6(d)(3)) D2. Was the Plan revised to reflect progress in local mitigation effort? (Requirement §201.6(d)(3)) D3. Was the Plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))
Source: FEMA, October 2011.

Six months prior to the fifth year of adoption, the planning team will undertake the following activities to evaluate the plan and ensure that the plan is readopted in the fifth year.

- Thoroughly analyze and update the risk of natural hazards.
- Review the previous annual reviews, including the mitigation activities progress reports.
- Provide a detailed review and revision of the Mitigation Strategy.
- Prepare a new Mitigation Action Plan with prioritized actions, responsible parties and resources.
- Prepare a new draft hazard mitigation plan and submit it to the City Council for adoption.
- Submit an updated hazard mitigation plan to DHS&EM and FEMA for approval.

Agencies identified as responsible parties for specific mitigation projects, will be responsible for monitoring mitigation project implementation and closeout. The status of the project implementation and closeout will be included with each annual review. In addition, each of these agencies and/or departments will be required to submit a closeout report at the conclusion of any mitigation project.

8.2 IMPLEMENTATION THROUGH EXISTING PLANNING MECHANISMS

DMA 2000 requirements for HMP incorporation into existing planning mechanisms are described below.

DMA 2000 Requirements
1. Regulation Checklist
Incorporation into Existing Planning Mechanisms §201.6(b)(3): Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.
Element A. Planning Process (Continued)
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information?
Source: FEMA, October 2011.

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 ALAKANUK CAPABILITY ASSESSMENT

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

Storm Water Management Ordinances: **No**

Stream Maintenance Ordinances: **No**

Zoning Management Ordinances: **No**

Subdivision Management Ordinances: **No**

Erosion Management Ordinances: **No**

Floodplain Management Ordinances: **No**

Fire Insurance Rating:

Floodplain Management Plan Published Date:

Floodplain Management Last Delineation Date:

Elevation Certificates Maintained: **No**

National Flood Insurance Program Community: **No**

National Flood Insurance Program Join Date:

National Flood Insurance Program Number:

National Flood Insurance Program Rating:

National Flood Insurance Program Rating Date:

Flood Insurance Claims:

Land Use Plan: **Yes**

Land Use Plan Last Update: **June 2008**

Community Zoned: **No**

Zoned Date:

Established Building Codes: **No**

Building Codes Last Updated:

Type of Building Codes:

Local Electric Utilities: **AVEC**

Local Water Utilities: **City of Alakanuk**

Local Sewage Treatment Utilities: **City of Alakanuk**

Local Natural Gas Utilities: **N/A**

Local Telephone Utilities: **United Utilities, Inc.**

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 hazard mitigation planning process. They also include special tips on meeting DMA 2000 requirements. (http://www.fema.gov/plan/mitplanning/resources.shtm#1).
    - A Guide to Recovery Programs FEMA 229(4), September 2005. The programs described in this guide may all be of assistance during disaster incident recovery. Some are available only after a Presidential declaration of disaster, but others are available without a declaration. Please see the individual program descriptions for details. (http://www.fema.gov/txt/rebuild/ltrc/recoveryprograms229.txt)
    - 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. (http://www.fema.gov/business/guide/index.shtm)
    - The FEMA Hazard Mitigation Assistance (HMA Unified Guidance, June, 2009. The guidance introduces the five HMA grant programs, funding opportunities, award information, eligibility, application and submission information, application review process, administering the grant, contracts, additional program guidance, additional project guidance, and contains information and resource appendices (FEMA 2009).
- FEMA also administers emergency management grants which may be found on (http://www.fema.gov/help/site.shtm). Various firefighter grant programs can be found at (http://www.firegrantsupport.com/):
    - Emergency Management Performance Grant (EMPG). This is a pass through grant. The amount is determined by the State. The grant is intended to support critical assistance to sustain and enhance State and local emergency management capabilities

at the State and local levels for all-hazard mitigation, preparedness, response, and recovery including coordination of inter-governmental (Federal, State, regional, local, and tribal) resources, joint operations, and mutual aid compacts state-to-state and nationwide. Sub-recipients must be compliant with the National Incident Management System (NIMS) implementation as a condition for receiving funds. Requires 50% match.

- Assistance to Fire Fighters Grant (AFG), Fire Prevention and Safety (FP&S), Staffing for Adequate Fire and Emergency Response Grants (SAFER), and Assistance to Firefighters Station Construction Grant programs. Information can be found at (http://forestry.alaska.gov/fire/vfarfa.htm).

- Department of Homeland Security provides the following grants:
  - Homeland Security Grant Program (HSGP), The FY 2011 HSGP provides a primary funding mechanism for building and sustaining national preparedness capabilities. HSGP is comprised of five interconnected grant programs:
    - State Homeland Security Program (SHSP)
    - Citizen Corps Program (CCP)
  - The SHSP Grant provides funding to support the implementation of State Homeland Security Strategies to address the identified planning, organization, equipment, training, and exercise needs at the state and local levels to prevent, protect against, respond to, and recover from acts of terrorism and other catastrophic events. SHSP has three main priorities. They are: (1) Advancing "Whole Community" Security and Emergency Management; (2) Building Prevention and Protection Capabilities; and, (3) Maturation and Enhancement of State and Major Urban Area Fusion Centers.(http://www.fema.gov/government/grant/hsgp/index.shtm#1)
  - CCP. The Citizen Corps mission is to bring community and government leaders together to coordinate involving community members in emergency preparedness, planning, mitigation, response, and recovery activities.
  - Emergency Operations Center (EOC). This program is intended to improve emergency management and preparedness capabilities by supporting flexible, sustainable, secure, strategically located, and fully interoperable EOCs with a focus on addressing identified deficiencies and needs. Fully capable emergency operations facilities at the State and local levels are an essential element of a comprehensive national emergency management system and are necessary to ensure continuity of operations and continuity of government in major disasters or emergencies caused by any hazard. Requires 25% match.

- U.S. Department of Commerce’s grant programs include:
  - Remote Community Alert Systems (RCASP) grant for outdoor alerting technologies in remote communities effectively underserved by commercial mobile service for the purpose of enabling residents of those communities to receive emergency messages. This program is a contributing element of the Warning, Alert, and Response Network (WARN) Act.

- National Oceanic and Atmospheric Administration (NOAA), provides funds to the State of Alaska due to Alaska's high threat for tsunami. The allocation supports the promotion of local, regional, and state level tsunami mitigation and preparedness; installation of warning communications systems; installation of warning communications systems; installation of tsunami signage; promotion of the Tsunami Ready Program in Alaska; development of inundation models; and delivery of inundation maps and decision-support tools to communities in Alaska.

- Department of Agriculture (USDA). Disaster assistance programs include: Emergency Conservation Program, Non-Insured Assistance, Emergency Forest Restoration Program, Emergency Watershed Protection, Rural Housing Service, Rural Utilities Service, and Rural Business and Cooperative Service. (http://www.fsa.usda.gov/FSA/webapp?area=home&subject=diap&topic=landing)
- Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy, Weatherization Assistance Program (http://www1.eere.energy.gov/wip/wap.html). 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.
  - The Tribal Energy Program offers financial and technical assistance to Indian tribes to help them create sustainable renewable energy installations on their lands. This program promotes tribal energy self-sufficiency and fosters employment and economic development on America's tribal lands. (http://www1.eere.energy.gov/wip/tribal.html)
- US Environmental Protection Agency (EPA). Under EPA's Clean Water State Revolving Fund (CWSRF) program, each state maintains a revolving loan fund to provide independent and permanent sources of low-cost financing for a wide range of water quality infrastructure projects, including: municipal wastewater treatment projects; non-point source projects; watershed protection or restoration projects; and estuary management projects. (http://yosemite.epa.gov/R10/ecocomm.nsf/6da048b9966d22518825662d00729a35/7b68c420b668ada5882569ab00720988!OpenDocument)
  - Public Works and Development Facilities Program. This program provides assistance to help distressed communities attract new industry, encourage business expansion, diversify local economies, and generate long-term, private sector jobs. Among the types of projects funded are water and sewer facilities, primarily serving industry and commerce; access roads to industrial parks or sites; port improvements; business incubator facilities; technology infrastructure; sustainable development activities; export programs; brownfields redevelopment; aquaculture facilities; and other infrastructure projects. Specific activities may include demolition, renovation, and construction of public facilities; provision of water or sewer infrastructure; or the development of stormwater control mechanisms (e.g., a retention pond) as part of an industrial park or other eligible project. (http://cfpub.epa.gov/fedfund/program.cfm?prog_num=51)

- Department of Health and Human Services, 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/programs/program_information.html)
- Department of Housing and Urban Development (HUD). HUD provides a variety of disaster resources. They also partner with Federal and state agencies to help implement disaster recovery assistance. Under the *National Response Framework* the FEMA and the Small Business Administration (SBA) offer initial recovery assistance (http://www.hud.gov/info/disasterresources_dev.cfm).
    - 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. (http://www.hud.gov/offices/cpd/communitydevelopment/programs/108/index.cfm)
    - HUD, Office of Homes and Communities, Section 184 Indian Home Loan Guarantee Programs. The Section 184 Indian Home Loan Guarantee Program is a home mortgage specifically designed for American Indian and Alaska Native families, Alaska Villages, Tribes, or Tribally Designated Housing Entities. Section 184 loans can be used, both on and off native lands, for new construction, rehabilitation, purchase of an existing home, or refinance.
    - Because of the unique status of Indian lands being held in Trust, Native American homeownership has historically been an underserved market. Working with an expanding network of private sector and tribal partners, the Section 184 Program endeavors to increase access to capital for Native Americans and provide private funding opportunities for tribal housing agencies with the Section 184 Program. (http://www.hud.gov/offices/pih/ih/homeownership/184/)
    - 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. (http://www.hud.gov/offices/cpd/communitydevelopment/programs/)
- Department of Labor (DOL), 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. (http://www.workforcesecurity.doleta.gov/unemploy/disaster.asp)
    - The Workforce Investment Act contains provisions aimed at supporting employment and training activities for Indian, Alaska Native, and Native Hawaiian individuals. The Department of Labor's Indian and Native American Programs (INAP) funds

grant programs that provide training opportunities at the local level for this target population. (http://www.dol.gov/dol/topic/training/indianprograms.htm)

- U.S. Department of Transportation, Hazardous Materials Emergency Preparedness Grant. To increase State, Territorial, Tribal and local effectiveness in safely and efficiently handling hazardous materials accidents and incidents, enhance implementation of the Emergency Planning and Community Right-to-Know Act of 1986, and encourage a comprehensive approach to emergency training and planning by incorporating the unique challenges of responses to transportation situations, through planning and training. Requires a 20% local match.
- 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), Disaster Tax Relief. Provides extensions to current year's tax return, allows deductions for disaster losses, and allows amendment of previous year’s tax returns. (http://www.irs.gov/newsroom/article/0,,id=108362,00.html)
- Natural Resources Conservation Service (NRCS) has several funding sources to fulfill mitigation needs. (http://www.ak.nrcs.usda.gov/sitemap.html)
    - The Emergency Watershed Protection Program (EWP). This funding source is designed is to undertake emergency measures, including the purchase of flood plain easements, for runoff retardation and soil erosion prevention to safeguard lives and property from floods, drought, and the products of erosion on any watershed whenever fire, flood or any other natural occurrence is causing or has caused a sudden impairment of the watershed.
    - Wildlife habitat Incentives Program (WHIP). This is a voluntary program for conservation-minded landowners who want to develop and improve wildlife habitat on agricultural land, nonindustrial private forest land, and Indian land.
    - Watershed Planning. NRCS watershed activities in Alaska are voluntary efforts requested through conservation districts and units of government and/or tribes. The watershed activities are lead locally by a "watershed management committee" that is comprised of local interest groups, local units of government, local tribal representatives and any organization that has a vested interest in the watershed planning activity. This committee provides direction to the process as well as provides the decision-making necessary to implement the process. Technical assistance is provided to the watershed management committee through a "technical advisory committee" comprised of local, state and federal technical specialist. These specialists provide information to the watershed management committee as needed to make sound decisions. NRCS also provides training on watershed planning organization and process.
- U.S. Small Business Administration (SBA) Disaster Assistance (http://www.sba.gov/category/navigation-structure/starting-managing-business/managing-business/running-business/emergency-preparedness-and-disaster-)

provides information concerning disaster assistance, preparedness, planning, cleanup, and recovery planning.

  - May provide low-interest disaster loans to individuals and businesses that have suffered a loss due to a disaster. (http://www.sba.gov/category/navigation-structure/loans-grants/small-business-loans/disaster-loans). Requests for SBA loan assistance should be submitted to DHS&EM.

- 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 (http://www.poa.usace.army.mil/en/cw/index.htm). The USACE is a member and co-chair of the Alaska Climate Change Sub-Cabinet.

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 elevating, relocating, or acquiring hazard-prone properties. (http://www.ak-prepared.com/plans/mitigation/mitigati.htm)

  DHS&EM also provides mitigation funding resources for mitigation planning on their Web site at http://www.ak-prepared.com/plans/mitigation/localhazmitplan.htm.

- Division of Senior Services (DSS): Provides special outreach services for seniors, including food, shelter and clothing. (http://www.hss.state.ak.us/dsds/seniorInfoResources.htm)

- Division of Insurance (DOI): Provides assistance in obtaining copies of policies and provides information regarding filing claims. (http://www.dced.state.ak.us/insurance/)

- Department of Military and Veterans Affairs (DMVA): Provides damage appraisals and settlements for VA-insured homes, and assists with filing of survivor benefits. (http://veterans.alaska.gov/links.htm)

- DCRA within the DCCED. 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. (http://www.commerce.state.ak.us/dca/)

- Department of Environmental Conservation (DEC). The DEC 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. (http://dec.alaska.gov/)

- The Division of Water's Village Safe Water Program works with rural communities to develop sustainable sanitation facilities. Communities apply each year to VSW for grants for sanitation projects. Federal and state funding for this program is administered and managed by the State of Alaska's Village Safe Water (VSW) program. VSW provides technical and financial support to Alaska's smallest communities to design and construct water and wastewater systems. In some cases, funding is awarded by VSW through the Alaska Native Tribal Health Consortium, who in turn assist communities in design and construct of sanitation projects.
- Municipal Grants and Loans Program. The Department of Environmental Conservation / Division of Water administer the Alaska Clean Water Fund (ACWF) and the Alaska Drinking Water Fund (ADWF). The division is fiscally responsible to the Environmental Protection Agency (EPA) to administer the loan funds as the EPA provides capitalization grants to the division for each of the loan funds. In addition, it is prudent upon the division to administer the funds in a manner that ensures their continued viability.
- Under EPA's Clean Water State Revolving Fund (CWSRF) program, each state maintains a revolving loan fund to provide independent and permanent sources of low-cost financing for a wide range of water quality infrastructure projects, including: municipal wastewater treatment projects; non-point source projects; watershed protection or restoration projects; and estuary management, [and stormwater management] projects. (http://yosemite.epa.gov/R10/ecocomm.nsf/6da048b9966d22518825662d00729a35/7b68c420b668ada5882569ab00720988!OpenDocument)
- Alaska's Revolving Loan Fund Program, prescribed by Title VI of the Clean Water Act as amended by the Water Quality Act of 1987, Public Law 100-4. DEC will use the ACWF account to administer the loan fund. This Agreement will continue from year-to-year and will be incorporated by reference into the annual capitalization grant agreement between EPA and the DEC. DEC will use a fiscal year of July 1 to June 30 for reporting purposes. (http://www.epa.gov/region10/pdf/water/srf/cwsrf_alaska_operating_agreement.pdf)

- Department of Transportation and Public Facilities (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.
  - 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 the safe, efficient, economical, and effective State highway, harbor, and airport operation. DOT/PF uses it's Planning, Design and Engineering, Maintenance and Operations, and Intelligent Transportation Systems

resources to identify hazards, 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 temporary bridge replacements and materials necessary to make the multi-modal transportation system operational following natural disaster events.

- 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 Alaska's mineral, land, and water resources use, development, and earthquake mitigation collaboration.
  - Their geologists and support staff are leaders in researching Alaska's geology and implementing technological tools to most efficiently collect, interpret, publish, archive, and disseminate information to the public. Information is available at: (http://www.dggs.dnr.state.ak.us/index.php?menu_link=publications&link=publications_search#)
  - The DNR's Division of Forestry (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. (http://forestry.alaska.gov/pdfs/08FireSuppressionMediaGuide.pdf)
  - DOF also manages various wildland fire programs, activities, and grant programs such as the FireWise Program (http://forestry.alaska.gov/fire/firewise.htm), Community Forestry Program (CFP) (http://forestry.alaska.gov/community/), Assistance to Fire Fighters Grant (AFG), Fire Prevention and Safety (FP&S), Staffing for Adequate Fire and Emergency Response Grants (SAFER), and Volunteer Fire Assistance and Rural Fire Assistance Grant (VFA-RFA) programs (http://forestry.alaska.gov/fire/vfarfa.htm). 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 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. (http://dialoguemakers.org/Resourses4states+Nonprofits.htm)
- Denali Commission. Introduced by Congress in 1998, the Denali Commission is an independent federal agency designed to provide critical utilities, infrastructure, and economic support throughout Alaska. With the creation of the Denali Commission, Congress acknowledged the need for increased inter-agency cooperation and focus on Alaska's remote communities. Since its first meeting in April 1999, the Commission is credited with providing numerous cost-shared infrastructure projects across the State that exemplifies effective and efficient partnership between federal and state agencies, and the private sector. (http://www.denali.gov/index.php?option=com_content&view=section&id=1&Itemid=3)
    - The Energy Program primarily funds design and construction of replacement bulk fuel storage facilities, upgrades to community power generation and distribution systems, alternative-renewable energy projects, and some energy cost reduction projects. The Commission works with the Alaska Energy Authority (AEA), Alaska Village Electric Cooperative (AVEC), Alaska Power and Telephone and other partners to meet rural communities' fuel storage and power generation needs.
    - The goal of the solid waste program at the Denali Commission is to provide funding to address deficiencies in solid waste disposal sites which threaten to contaminate rural drinking water supplies.
- Lindbergh Foundation Grants. Each year, The Charles A. and Anne Morrow Lindbergh Foundation provides grants of up to $10,580 (a symbolic amount representing the cost of the Spirit of St. Louis) to men and women whose individual initiative and work in a wide spectrum of disciplines furthers the Lindbergh's' vision of a balance between the advance of technology and the preservation of the natural/human environment. (http://www.lindberghfoundation.org/docs/index.php/our-grants)
- Rasmuson Foundation Grants. The Rasmuson foundation invests both in individuals and well-managed 501(c)(3) organizations dedicated to improving the quality of life for Alaskans.

  The Foundation seeks to support not-for-profit organizations that are focused and effective in the pursuit of their goals, with special consideration for those organizations that demonstrate strong leadership, clarity of purpose and cautious use of resources.

  The Foundation trustees believe successful organizations can sustain their basic operations through other means of support and prefer to assist organizations with specific needs, focusing on requests which allow the organizations to become more efficient and effective. The trustees look favorably on organizations which demonstrate broad

community support, superior fiscal management and matching project support. (http://www.rasmuson.org/index.php)

Local Resources

The City has a number of planning and land management tools that will allow it to implement hazard mitigation activities. The resources available in these areas have been assessed by the hazard mitigation Planning Team, and are summarized below.

Table 8-2 Alakanuk's Administrative and Technical Resources

Staff/Personnel Resources	Yes/No	Department/Agency and Position
Planner or engineer with knowledge of land development and land management practices	No	The City hires consultants with land development and land management knowledge
Engineer or professional trained in construction practices related to buildings and/or infrastructure	No	The City may hire engineering consulting services
Planner or engineer with an understanding of natural and/or human-caused hazards	No	The City hires consultants with hazard mitigation knowledge
Floodplain Manager	No	Taunnie Boothby, State Floodplain Manager
Surveyors	No	The City may hire surveying consulting services
Staff with education or expertise to assess the jurisdiction's vulnerability to hazards	No	The City hires consultants with this knowledge
Personnel skilled in Geospatial Information System (GIS) and/or HAZUS-MH	No	The City hires consultants with this knowledge
Scientists familiar with the hazards of the jurisdiction	No	U.S. Fish & Wildlife Service local office; Alaska Dept. of Fish & Game local office
Emergency Manager	Yes	City Mayor or Tribal Chief (Situation dependent)
Finance (Grant writers)	Yes	City or Tribal Administrator (Situation dependent)
Public Information Officer	Yes	City Mayor or Tribal Chief (Situation dependent)

Table 8-3 Financial Resources for Hazard Mitigation

Financial Resource	Accessible or Eligible to Use for Mitigation Activities
General funds	Limited funding, can exercise this authority with voter approval
Community Development Block Grants	Limited funding, can exercise this authority with voter approval
Capital Improvement Projects Funding	Limited funding, can exercise this authority with voter approval
Authority to levy taxes for specific purposes	Limited funding, can exercise this authority with voter approval
Incur debt through general obligation bonds	Can exercise this authority with voter approval
Incur debt through special tax and revenue bonds	Can exercise this authority with voter approval

Table 8-3 Financial Resources for Hazard Mitigation

Financial Resource	Accessible or Eligible to Use for Mitigation Activities
Incur debt through private activity bonds	Can exercise this authority with voter approval
Hazard Mitigation Grant Program (HMGP)	FEMA funding which is available to local communities after a Presidentially-declared disaster. It can be used to fund both pre- and post-disaster mitigation plans and projects.
Pre-Disaster Mitigation (PDM) grant program	FEMA funding which available on an annual basis. This grant can only be used to fund pre-disaster mitigation plans and projects only
Flood Mitigation Assistance (FMA) grant program	FEMA funding which is available on an annual basis. This grant can be used to mitigate repetitively flooded structures and infrastructure to protect repetitive flood structures.
United State Fire Administration (USFA) Grants	The purpose of these grants is to assist state, regional, national or local organizations to address fire prevention and safety. The primary goal is to reach high-risk target groups including children, seniors and firefighters.
Fire Mitigation Fees	Finance future fire protection facilities and fire capital expenditures required because of new development within Special Districts.

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
1. Regulation Checklist
Continued Public Involvement §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 A . Planning Process (Continued)
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))
Source: FEMA, October 2011.

The City of Alakanuk is dedicated to involving the public directly in the continual reshaping and updating of the HMP. A paper copy of the HMP and any proposed changes will be available at the City Office. An address and phone number of the Planning Team Leader to which people may direct their comments or concerns will also be available at the 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 door to door surveys. 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
Review Tool

LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool.*

Jurisdiction: City of Alakanuk, AK	**Title of Plan:** Hazard Mitigation Plan 2012 Update	**Date of Plan:** November 20, 2012
Local Point of Contact: Hilda Stern	**Address:** City of Alakanuk P.O. Box 167 Alakanuk, AK 99554	
Title: City Manager		
Agency: City of Alakanuk		
Phone Number: 907-238-3313	**E-Mail:** alakanukcityoffice@yahoo.com	

State Reviewer:	**Title:**	**Date:**
Scott Nelsen	Emergency Management Specialist	November 20, 2012

FEMA Reviewer:	**Title:**	**Date:**
Hilary Kendro	STARR	1/16/2013
Nathan Slaughter	STARR	1/30/2013
Brett Holt	FEMA	2/4/2013
Date Received in FEMA Region X	12/21/2013	
Plan Not Approved		
Plan Approvable Pending Adoption	2/4/2013	
Plan Approved	2/22/2013	

SECTION 1:
REGULATION CHECKLIST

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Section 4.1 pp 4-2 to 4-3	X	
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Section 4.2 & 4.3 pp 4-3 to 4-4	X	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Section 4.3 pp 4-3 to 4-4	X	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Section 4.1 p 4-2	X	
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Section 8.4 pp 8-15 to 8-16	X	
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Section 8.1 pp 8-1 to 8-2	X	
ELEMENT A: REQUIRED REVISIONS			
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT			
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Section 5.2 through 5.3 pp 5-1 to 5-33	X	
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Section 5.2 through 5.3 pp 5-1 to 5-33	X	
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Section 5.2 through 5.3 pp 5-1 to 5-33	X	
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Section 1.3 pp 1-2 to 1-3	X	
ELEMENT B: REQUIRED REVISIONS			

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT C. MITIGATION STRATEGY			
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Section 2.1 p 2-1 & Section 8.3 pp 8-3 to 8-15	X	
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Section 1.3 p 1-3, Section 1.4 p 1-4, Section 6.2.1.2 p 6-3	X	
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section 7.1 p 7-1	X	
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Section 7.2 pp 7-2 to 7-6	X	
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Section 7.3 pp 7-7 to 7-10	X	
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Section 8.2 pp 8-2 to 8-3	X	
ELEMENT C: REQUIRED REVISIONS			
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)			
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Section 6.3 pp 6-9 to 6-17	X	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Section 6.3 pp 6-12 to 6-17	X	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Section 4.1 p 4-2, Section 7.3 pp 7-7 to 7-10	X	
ELEMENT D: REQUIRED REVISIONS			
ELEMENT E. PLAN ADOPTION			
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Section 2.1 p 2-1, Appendix B	X	

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))			N/A
ELEMENT E: REQUIRED REVISIONS			
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)			
F1.			
F2.			
ELEMENT F: REQUIRED REVISIONS			

SECTION 2:
PLAN ASSESSMENT

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

Plan Strengths:

- The plan inventories the names and corresponding agencies of all the planning team participants. Both the City and State are represented on the Team.
- Specific actions are identified to encourage continued public involvement and incorporation of public comments into future plan updates.
- The plan includes the point of contact for continued plan maintenance. An annual review form for future plan additions is included as an Appendix to streamline the update process.

Opportunities for Improvement:

- Describe in more detail how information from existing plans, studies, and reports was incorporated into the mitigation plan. If existing plans were not incorporated, describe why.
- The plan states that citizens were invited to participate in public meetings via door to door surveys. Include how many residences were visited and how many residences responded to the door to door process. Describe if other public participation methods were considered and indicate why the actions were not explored.
- Describe additional resources used to notify the public of meetings and participation opportunities throughout the planning process. If additional resources were not used, identify what limitations may have existed.
- Identify the neighboring communities and local and regional agencies and departments that were contacted to initiate plan participation.
- Explore the possibilities of including a more diverse group of stakeholders in Hazard Planning Team for future plan updates.

Element B: Hazard Identification and Risk Assessment

Plan Strengths:

- The plan includes detailed hazard profiles for all identified hazards. Each hazard section describes the criteria and methodology used to evaluate and determine probability and magnitude/severity, including resources and methodology.
- Maps and photos were used to illustrate the location of at-risk areas and previous damages occurrences.
- The Hazard Profile and Vulnerability Analysis sections include recent data such as an erosion assessment report and 2010 Census data. The plan includes estimates of the number and type of structures exposed to the identified hazards.
- The plan employs GIS data, were available, to assist in accessing the community's vulnerability to identified hazards.

Opportunities for Improvement:

- Define the type of residential structures included in the Vulnerability Analysis total amounts.
- Identify any data gaps that can be filled in the future as new data becomes available.
- The plan indicates that the community did not have the technical resources to perform a Hazus analysis of applicable hazards. Indicate if Hazus analyses will be pursued in future plan updates.

Element C: Mitigation Strategy

Plan Strengths:

- The identified mitigation actions for each hazard address the city's hazard risk and community vulnerability descriptions.
- For each identified mitigation action, a correlating mitigation goal is identified along with a potential funding source, duration, and possible department or agency partnership.
- The STAPLEE approach and benefit-cost analysis was used to prioritize the mitigation actions.

Opportunities for Improvement:

- Expand the capability assessment to include the identification of resources that are available to accomplish mitigation action items such as existing authorities, staff, or funding through taxing authority and annual budgets. If resources are not available, indicate why or how they can be established for future plan updates.
- Consider including additional mitigation actions that address existing or proposed infrastructure.
- Use narrative text to explain how the previous mitigation plan has been incorporated into other planning mechanisms. Describe how the community will expand on, improve, or pursue existing policies and programs identified in the plan.
- Describe how the community plans to pursue NFIP status in the future.

Element D: Plan Update, Evaluation, and Implementation (*Plan Updates Only*)

Plan Strengths:

- The plan includes a description of the development trends and projects future development based on updated trends.
- The plan lists infrastructure improvement and structural projects that are occurring and have been completed. Each identified project identifies the lead agency, project status, and total project cost amount.
- The plan includes a summary of the enhancements that were made during the 2012 plan update.
- A specific timelines and process is described for plan maintenance and updates.

Opportunities for Improvement:

- Clearly indicate which mitigation actions were accomplished from the original plan.
- Identify possible solutions to obstacles that prevented the completion of mitigation actions in the previous plan so they can be overcome in the future (i.e. ways to increase funding and staff resources).
- Designate the hazard mitigated by each occurring and completed project.
- Identify and describe changes in the prioritization of mitigation actions since original plan adoption. If the priorities did not change, describe why.

B. Resources for Implementing Your Approved Plan

- The Local Mitigation Plan Review Guide and Tool – October 1, 2011 is available through FEMA's Library and should be referred to for the 2017 plan update. http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&id=4859
- Another resource that will be available for use during the next plan update is a plan development and update handbook. The handbook is expected to be released in early 2013 and will be available through FEMA's mitigation planning resources website. http://www.fema.gov/plan/mitplanning/resources.shtm
- The FEMA Region X Risk Mapping, Analysis, and Planning program (RiskMAP) releases a monthly newsletter that includes information about upcoming events and training opportunities, as well as hazard and risk related news from around the Region. Past newsletters can be viewed at http://www.starr-team.com/starr/RegionalWorkspaces/RegionX/Pages/default.aspx. If you would like to receive future, email rxnewsletter@starr-team.com.

- The mitigation strategy includes projects that are eligible for FEMA's grant programs. Contact the State Hazard Mitigation Officer, Mark Roberts, at mark.roberts@alaska.gov for application information.

Appendix B
Adoption Resolution

Alakanuk City Office
P.O. Box 167
Alakanuk, Alaska 99554
(907) 238-3313/3316
FAX (907) 238-3620

City of Alakanuk Hazard Mitigation Plan
Adoption
Resolution # 13-02

Whereas, the City of Alakanuk, Alaska has experienced repetitive disasters that have damaged commercial, residential and public health and safety concerns; and

Whereas, the community has perpared a Hazard Mitigation Plan that outlines the community's options to reduce overall damage and impact from natural hazards, and

Whereas, the Hazard Mitigation Plan has been reviewed by community residents, business owners, and federal, state and local agencies, and has been revised to reflect their concerns:

Therefore, Be It Resolved that:

1. The Hazard Mitigation Plan is hereby adopted as an official plan of the City of Alakanuk
2. A Hazard Mitigation Planning Group is hereby established as a permanent community advisory body. The Hazard Mitigation Planning Team Leader shall serve one (1) year terms. The group's duties shall be as designated in the Hazard Mitigation Plan.
3. The Hazard mitigation Planning Team Leader is charged with supervising the implementation of the Plan's recommendations within the funding limitations as provided by the City of Alakanuk or other sources.
4. The Hazard Mitigation Planning Team Leader shall give priority attention to the following action items recommended by the Hazard Mitigation:

   a. Relocate builings that are at risk of being affected by erosion.
   b. Apply for grants or other funding mechanism to implement riverbank protection methods.
   c. Join the National Flood Insurance Program, which regulated development in floodplains and provides federally backed insurance to indviduals who live in communities that have joined the the program.
   d. Hold a series of community meeting to train on the earthquake safety and drills at schools.
   e. Develop a workshop at school and students display mitigation projects.
   f. Conduct a series of community meetings to train on tsunami safety and hold drills at schools.

5. The Hazard Mitigations Planning team Leader shall convene the hazard mitigation planning group quarterly. The planning group shall monitor implementation of the plan and shall submit a written progress report to the City of Alakanuk in accordance with the following format:

   a. A review of the original plan.
   b. a review of any disasters or emergencies that occurred during the previous calendar year.
   c. a review of the actions taken, including what was accomplished during the previous year.
   d. A discussion of any implementations problems.
   e. Recommendations for new projects or revised action items. such recommendations shall be subject to approval by the City of Alakanuk

PASSED AND APPROVED THIS 17 DAY OF FEBURARY, 2013

Aaron Kameroff
Mayor, City of Alakanuk

ATTEST:

Pamela Cook, City Clerk

Appendix C
Public Outreach

alakanukcityoffice@yahoo.com

Minutes of Meeting on June 26, 2012 1:00 p.m.

Called to order by Gabriel Buster at 1:17 p.m.

Roll Call: Bill Lamont(Mayor), Gabriel Buster(Vise Mayor) Sally Leopold, Eusebia Augline, Lawrence Edmund, Anthony Shelton, Aaron Kameroff, Quorum established. Visitors: Cecelia Tucker, Kevin George, Marita Hanson, Terence Augline, Henry Phillip, Josephine James.

On New Business #9: We discussed the FEMA 5 year update plan. What were priorities, there were 12 homes that needed to be protected from the erosion. There are three buildings that are very close to the bank that needs to be addressed immediately due to the vast areas of the two eddies that we have in our Alakanuk Slough.

We also discussed about the fact that the roads needs to be improved because they have many potholes. Which when the flood comes it washes away the silt, mud and rocks that make up the road.

Another issue was that the landfill is a mess and would need a new landfill site for health and safety issues. A dozer is needed for use for this project in which the City does not have an operating one.

Meeting was adjourned at 5:26 p.m.

Community Hazard Mitigation Survey

1) How many are extremely concerned personally about the following disasters affecting their town?
   A. Erosion: 71
   B. Fall Storm: 46
   C. Earthquake: 34
   D. Flood: 68
   E. Wildfire: 35
   F. Tsunami: 39
   G. Wind Storm: 45
   H. Winter Storm: 50

2) What are the high priorities the community needs to take for hazard mitigation?
   A. Erosion Protection: 71
   B. Housing Relocation: 76
   C. Housing Elevation: 75
   D. Flood Levees: 73
   E. Wildfire Barriers: 40
   F. Evacuation Routes: 59
   G. Dump Mitigation: 76
   H. Drainage: 60

Appendix D
Benefit–Cost Analysis Fact Sheet

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

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: