City of Eagle
Native Village of Eagle
Hazard Mitigation Plan


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Prepared Jointly by
The City & Village of Eagle
Hazard Mitigation Planning Team
October 14, 2014

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U.S. Department of Homeland Security
FEMA Region X
Federal Regional Center
130 228th Street, SW
Bothell, WA 98021-8627

FEMA

October 14, 2014

Honorable Donald A. Woodruff
Mayor, City of Eagle
P.O. Box 1901
Eagle, Alaska 99738

Dear Mayor Woodruff:

The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) has approved the ***City of Eagle Hazard Mitigation Plan*** as a local plan as outlined in 44 CFR Part 201. With approval of this plan, the City of Eagle is now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through October 13, 2019.

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

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Acronyms/Abbreviations

°F	Degrees Fahrenheit
ACCIMP	Alaska Climate Change Impact Mitigation Program
ACWF	Alaska Clean Water Fund
ADWF	Alaska Drinking Water Fund
AEA	Alaska Energy Authority
AEEE	Alternative Energy And Energy Efficiency
AFG	Assistance To Firefighters Grant
AHFC	Alaska Housing Finance Corporation
AICC	Alaska Interagency Coordination Center
AK	Alaska
ANA	Administration For Native Americans
ARC	American Red Cross
ARRA	American Recovery and Reinvestment Act
AVEC	Alaska Village Electric Cooperative
BIA	Bureau Of Indian Affairs
CCP	Citizen Corps Program
CDBG	Community Development Block Grant
CFR	Code Of Federal Regulations
CFP	Community Forestry Program
City	City Of Eagle
CWSRF	Clean Water State Revolving Fund
DCCED	Department Of Commerce, Community, And Economic Development
DCRA	Division Of Community And Regional Affairs
DEC	Department Of Environmental Conservation
Denali	Denali Commission
DHS	Department Of Homeland Security
DHS&EM	Division Of Homeland Security And Emergency Management
DHSS	Department Of Health And Social Services
DGGS	Division Of Geological And Geophysical Survey
DMA 2000	Disaster Mitigation Act Of 2000
DMVA	Department Of Military And Veterans Affairs
DNR	Department Of Natural Resources
DOE	Department Of Energy
DOF	Division Of Forestry
DOI	Division Of Insurance
DOL	Department Of Labor
DOT/PF	Department Of Transportation And Public Facilities
DSS	Division Of Senior Services
EOC	Emergency Operations Center
EMPG	Emergency Management Performance Grant
EPA	Environmental Protection Agency
EQ	Earthquake

Acronyms/Abbreviations

ER	Erosion
EWP	Emergency Watershed Protection Program
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FL	Flood
FMA	Flood Mitigation Assistance
FP&S	Fire Prevention And Safety
ft	Feet
FY	Fiscal Year
g	Gravity
GF	Ground Failure
GIS	Geospatial Information System
Hazus	Hazard United States – Multi-Hazard Software
HEA	Hazard Exposure Analysis
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HSGP	Homeland Security Grant Program
HUD	Housing And Urban Development
IBHS	Institute For Business And Home Safety
IHBG	Indian Housing Block Grant
IHLGP	Indian Home Loan Guarantee Program
INAP	Indian And Native American Programs
IRS	Internal Revenue Service
Kts	Knots
M	Magnitude
MAP	Mitigation Action Plan
MMI	Modified Mercalli Intensity
mph	Miles Per Hour
NAHASDA	Native American Housing Assistance And Self Determination Act
NFIP	National Flood Insurance Program
NIMS	National Incident Management System
NOAA	National Oceanic And Atmospheric Administration
NRF	National Response Framework
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
PDM	Pre-Disaster Mitigation
PGA	Peak Ground Acceleration
PILT	Payment In Lieu of Taxes
PNP	Private Non-Profits
RCASP	Remote Community Alert Systems
RD	Rural Development
RFA	Rural Fire Assistance Grant

Acronyms/Abbreviations

RL	Repetitive Loss
RurAL CAP	Rural Alaska Community Action Program Incorporated
SAFER	Staffing For Adequate Fire And Emergency Response
SBA	U.S. Small Business Administration
SHMP	Alaska State Hazard Mitigation Plan
SHSP	State Homeland Security Program
SOA	State Of Alaska
Sq.	Square
SRS	State Revenue Sharing
Stafford Act	Robert T. Stafford Disaster Relief And Emergency Assistance Act
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic, And Environmental
URS	URS Corporation
US or U.S.	United States
USACE	United States Army Corps Of Engineers
USC	United States Code
USDA	United States Department Of Agriculture
USGS	United States Geological Survey
VFA	Volunteer Fire Assistance And
VSW	Village Safe Water
WARN	Warning, Alert, And Response Network
WHIP	Wildlife Habitat Incentives Program

1

INTRODUCTION

Section One 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

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

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

In October 2007 and July 2008, FEMA 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 current as of September 28, 2012 and applicable guidance documents.

1.2 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 competitive, disaster funded, grant program. Whereas the other Unified Mitigation Assistance Programs: Pre-Disaster Mitigation (PDM) and Flood Mitigation Assistance (FMA) programs although competitive, rely on specific 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.

The Hazard Mitigation Grant Program (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 Pre-Disaster Mitigation (PDM) and Flood Mitigation Assistance (FMA) 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).

1.2.1 Hazard Mitigation Assistance (HMA) Unified Programs

HMA grant program activities include:

Table 1-1 HMA Eligible Activities

Activities	HMGP	PDM	FMA
1. Mitigation Projects	√	√	√
Property Acquisition and Structure Demolition	√	√	√
Property Acquisition and Structure Relocation	√	√	√
Structure Elevation	√	√	√
Mitigation Reconstruction			
Dry Floodproofing of Historic Residential Structures	√	√	√
Dry Floodproofing of Non-residential Structures	√	√	√
Minor Localized Flood Reduction Projects	√	√	√
Structural Retrofitting of Existing Buildings	√	√	
Non-Structural Retrofitting of Existing Buildings and Facilities	√	√	
Safe Room Construction	√	√	
Infrastructure Retrofit	√	√	
Soil Stabilization	√	√	
Wildfire Mitigation	√	√	
Post-disaster Code Enforcement	√		
5% Initiative Projects	√		
2. Hazard Mitigation Planning	√	√	√
3. Management Costs	√	√	√

(FEMA 2012)

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.

As the State Hazard Mitigation plan states:

"The [FMA] provides pre-disaster grants to State and Local Governments for planning and flood mitigation projects. Created by the National Flood Insurance Reform Act of 1994, its goal is to reduce or eliminate NFIP claims. It is an annual nationally competitive program. Residential and non-residential properties may apply for FMA grants through their NFIP community and are required to have NFIP insurance to be eligible. FMA grant funds may be used to develop the flood portions of hazard mitigation plans or to do flood mitigation projects. FMA grants are funded 75% Federal and 25% applicant.

The City of Eagle 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 Biggert-Waters Flood Insurance Reform Act of 2012 eliminated the Repetitive Flood Claims (RFC) and Severe Repetitive Loss (SRL) grant programs. Elements of these flood programs have been incorporated into FMA. The FMA program now allows for additional cost share flexibility:

- *Up to 100-percent Federal cost share for severe repetitive loss properties.*
- *Up to 90-percent Federal cost share for repetitive loss properties.*
- *Up to 75-percent Federal cost share for NFIP insured properties.*

The FMA program is available only to communities participating in the NFIP. In the State of Alaska, the Department of Commerce, Community, and Economic Development (DCCED) manages this program" (SHMP 2013).

HMP Layout Description

The HMP consists of the following sections and appendices:

Section 1 Introduction

Defines what a hazard mitigation plan is, delineates federal requirements and authorities, and introduces the Hazard Mitigation Assistance program listing the various grant programs and their historical funding levels.

Section 2 Community Description

Provides a general history and background of the City and Native Village of Eagle (City and Village respectively) and the, including historical trends for population and the demographic and economic conditions that have shaped the area.

Section 3 Planning Process

Describes the HMP update's planning process, identifies the Planning Team Members, the meetings held as part of the planning process, and the key stakeholders within the City and Native Village of Eagle and the surrounding area. This section documents public outreach activities (support documents are located in Appendix D); the review and incorporation of relevant plans, reports, and other appropriate information; actions the City and Native Village of Eagle plan to implement to assure continued public participation; and their methods and schedule for keeping the plan current.

This section also describes the Planning Team's formal plan maintenance process to ensure that the HMP remains an active and applicable document throughout its 5-year lifecycle. The process includes monitoring, reviewing, evaluating (Appendix F – Maintenance Documents), updating the HMP; and implementation initiatives.

Section 4 HMP Adoption

Describes the community's HMP adoption process (support documents are located in Appendix C)

Section 5 Hazard Analysis

Describes the process through which the Planning Team identified, screened, and selected the hazards to for profiling in this version of the HMP. The hazard analysis includes the nature, previous occurrences (history), location, extent, impact, and future event recurrence probability for each hazard. In addition, historical impact and hazard location figures are included when available.

Section 6 Vulnerability Analysis

Identifies the City and Native Village of Eagle's potentially vulnerable assets—people, residential and nonresidential buildings (where available), critical facilities, and critical infrastructure. The resulting information identifies the full range of hazards that the City could face and potential social impacts, damages, and economic losses. Land use and development trends are also discussed.

Section 7 Mitigation Strategy

Defines the mitigation strategy which provides a blueprint for reducing the potential losses identified in the vulnerability analysis. This section lists the community's governmental authorities, policies, programs and resources.

The Planning Team developed a list of mitigation goals and potential actions to address the risks facing the Eagle area. Mitigation actions include preventive actions, property protection techniques, natural resource protection strategies, structural projects, emergency services, and public information and awareness activities. Mitigation strategies were developed to address NFIP insured properties (if applicable) while encouraging participation with the NFIP and the reduction of flood damage to flood-prone structures.

Section 8 References

Lists reference materials and resources used to prepare this HMP.

Appendices

Appendix A Funding Resources:

Delineates Federal, State, and other potential mitigation funding sources. This section will aid the community with researching and applying for funds to implement their mitigation strategy.

Appendix B FEMA HMP Review Tool

Provides the FEMA Local Mitigation Plan Review Tool, which documents compliance with FEMA criteria.

Appendix C Community HMP Adoption Resolution

Provides the adoption resolution for the City and Native Village of Eagle.

Appendix D Public Outreach

Provides public outreach information, meeting minutes, correspondence, and newsletters.

Appendix E Benefit-Cost Analysis Fact Sheet

Contains the Benefit-Cost Analysis Fact Sheet used to prioritize mitigation actions.

Appendix F Plan Maintenance Documents

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

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2 COMMUNITY DESCRIPTION

Section Two describes the location, geography, history; demographics; and land use development trends of the City of Eagle and the Native Village of Eagle.

2.1 LOCATION, GEOGRAPHY, AND HISTORY

" The City of Eagle and Eagle Village are located on the Taylor Highway, 6 miles west of the Alaska-Canadian border. Eagle is on the left bank of the Yukon River at the mouth of Mission Creek within the Fairbanks Recording District. The Yukon-Charley Rivers National Preserve is northwest of the area. Latitude 64.7881, Longitude -141.2000" (Department of Community, Commerce, and Economic Development [DCCED], Division of Community and Regional Affairs [DCRA] 2012).

Figure 2-1 Eagle Location Map

The City covers approximately 1 square (sq.) mile of land. Seasonal temperature extremes affect the entire Eagle and Eagle Village area. Temperatures range from a winter low of -60 degrees Fahrenheit (°F) to a high of 72 °F. The area receives approximately 12.04 inches of rain and 56.2 inches of snow. (DCRA 2012, WRCC 2013).

By 1910, Fairbanks and Nome gold prospects had lured away many, and the population had declined to 178. Fort Egbert was abandoned in 1911.

The following is a brief sketch of the City's history:

	The area had been historically occupied by the Han Kutchin Indians.
1874	*Known as "Belle Isle" trading post for Upper Yukon area miners*
1897	*Eagle City funded – name derived from nearby nesting eagles*
1898	*Population increased to 1,700*
1899	*US Army camp established*
1900	*Fort Egbert completed*
1901	*Eagle became the first incorporated interior Alaska Territory City*
1903	*Valdez to Eagle telegraph line completed*
1910	*by this time Fairbanks and Nome gold had lured many reducing the population to 178*
1911	*Fort Egbert abandon*

(DCRA 2013)

2.2 DEMOGRAPHICS

Figure 2-2 illustrates the City of Eagle's historic population.

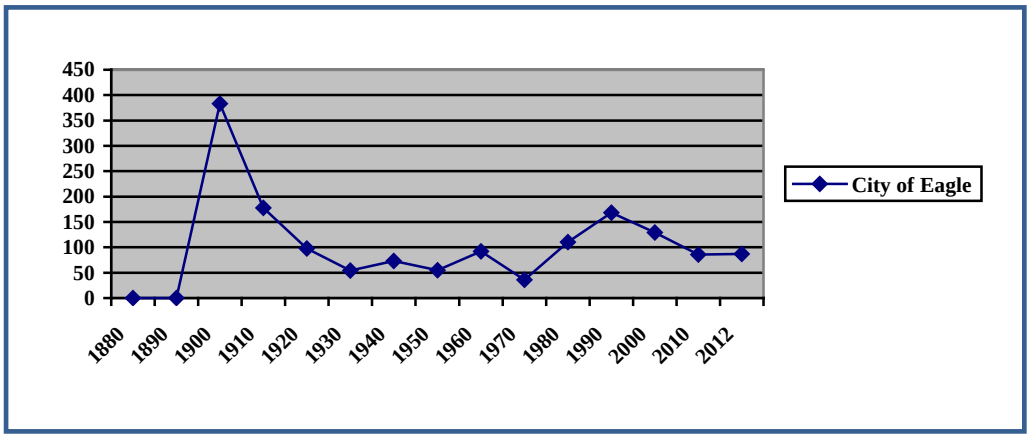

Figure 2-2 City of Eagle's Historic Population (US Census, DCRA 2013)

The 2010 census recorded 86 residents, of which the median age was 61 indicating a relatively old population. The population of Eagle is expected to remain steady because over half of the population is between 45 and 69 years of age. The City population is primarily white, 91 percent (%) with the remaining 8 % as Alaska Native and 1% identified as two or more races. The male and female composition is approximately 52 % and 48 % respectively. The 2010 census revealed that there are 41 households with the average household having approximately three individuals. The most recent 2010 DCRA certified population is 87.

Figure 2-3 illustrates the adjacent Native Village of Eagle's historic population.

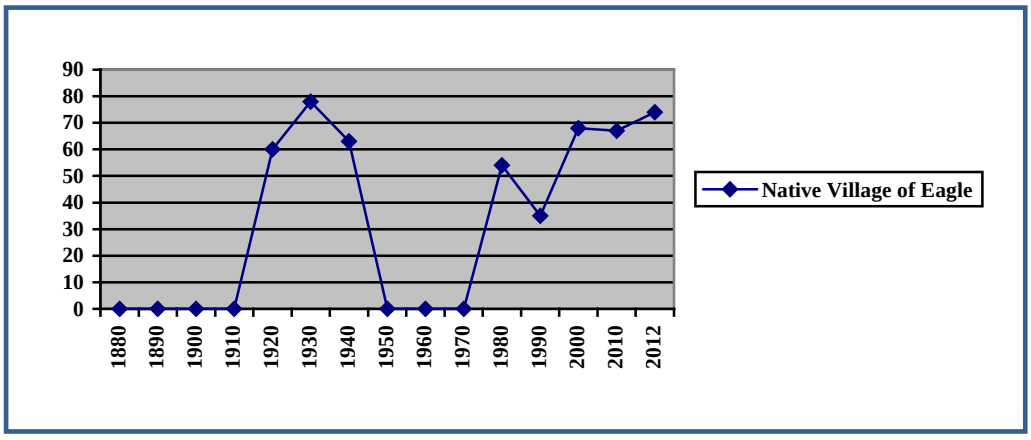

Figure 2-3 Native Village of Eagle's Historic Population (US Census, DCRA 2013)

The 2010 census recorded 67 residents, of which the median age was 46.5 indicating a relatively old population. The population of Eagle Village is expected to remain steady because over half of the population is between 44 and 69 years of age. The City population is fairly evenly split between white and Alaska Native population with white at 55.2 percent (%), Alaska Native at 38.81 %, and two or more races at nearly 6%. The male and female composition is

approximately 57 % and 43 % respectively. The 2010 census revealed that there are 31 households with the average household having approximately three individuals. The most recent 2010 DCRA certified population is 74.

2.3 ECONOMY

City of Eagle

The City's economy is based on local and state government employment and subsistence lifestyles. Residents rely on fish and wildlife resources to supplement their food resources. Tourism provides income during the summer travel season. DCRA states: "During the summer, the Holland America Tour Boat is available between Dawson City and Eagle on the Yukon River."

Table 3-4 provides worker characteristics for the City of Eagle.

Table 3-4 City of Eagle Employment Categories

Worker Classifications	2012
Residents age 16 and over	107
Residents employed	39
Female workers	15
Male workers	24
Workers age 45 and over	28
Workers age 50 and over	22
Sector employed in	
Private	17
Local government	19
State government	3
Peak quarterly employment	36
Workers employed all 4 quarters	20
New hires	17
Worked in an AGIA occupation	49

According to the 2010 census, the median household income in Eagle was $33,393 with a per capita income of $19,079. Approximately 16.9 % were reported to be living below the poverty level. The potential work force (those aged 16 years or older) in the City was estimated to be 107, of which 39 were actively employed. In 2010 the unemployment rate was 63.2 percent; however, this rate included part-time and seasonal jobs, and practical unemployment or underemployment is likely to be significantly higher.

Native Village of Eagle

DCRA states, *"Eagle Village is a Han Kutchin Indian village. Subsistence is an important part of the local culture."* The Village is situated 17 miles east of the City of Eagle.

Table 3-5 provides worker characteristics for Eagle Village.

Table 3-5 Eagle Village Employment Categories

Worker Classifications	2012
Residents age 16 and over	35
Residents employed	18
Female workers	7
Male workers	11
Workers age 45 and over	12
Workers age 50 and over	10
Sector employed in	
Private	7
Local government	8
State government	3
Peak quarterly employment	16
Workers employed all 4 quarters	6
New hires	8
Worked in an AGIA occupation	21

According to the 2010 census, the median household income in Eagle Village was $20,417 with a per capita income of $13,515. Approximately 39.02 % were reported to be living below the poverty level. The potential work force (those aged 16 years or older) in the City was estimated to be 34, of which 21 were actively employed. In 2010 the unemployment rate was 62 percent; however, this rate included part-time and seasonal jobs, and practical unemployment or underemployment is likely to be significantly higher.

Figure 2-4 depicts an aerial photograph of the Eagle area provided by Google.

Figure 2-4 Aerial Photograph of the City and Native Village of Eagle Area (GooglePro 2013)

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3

PLANNING PROCESS

Section Three 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. Outreach support documents and meeting information regarding the Planning Team and public outreach efforts are provided in Appendix D.

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

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? (Not applicable until 2013 update).
Source: FEMA, October 2011.

3.1 PLANNING PROCESS OVERVIEW

The State of Alaska, Division of Homeland Security and Emergency Management (DHS&EM) provided funding and project oversight to URS Corporation to facilitate and guide Planning Team development and HMP development.

The planning process began on July 15, 2013 with an initial teleconference with Mayor Woodruff to discuss the HMP planning project.

The Planning Team identified applicable City resources and capabilities during the meeting. URS explained how the HMP differed from current emergency plans. The Planning Team then discussed the City's rolls such as: acting as an advocate for the planning process, assisting with gathering information, and supporting public participation opportunities. There was also a brief discussion about hazards that affect the community such as erosion, sediment deposition, and permafrost impacts, which are increasing in intensity.

The Planning Team further discussed the hazard mitigation planning process, asking participants to help identify hazards that affect the City, to identify impacts to residential and critical facilities, and for assisting the Planning Team with identifying and prioritizing mitigation actions for potential future mitigation project funding

In summary, the following five-step process took place from July 2013 through September 2014.

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

3.2 HAZARD MITIGATION PLANNING TEAM

The local Planning Team members are Mayor Woodruff (Planning Team Leader), Darrell Christenson, Steve Hamilton, City Council members, Tribal Administrator Joyce Roberts and the Eagle Village Tribal Council.

Table 3-1 identifies the hazard complete mitigation Planning Team.

Table 3-1 Hazard Mitigation Planning Team

Name	Title	Organization	Key Input
Donald Woodruff	Mayor	City of Eagle	Planning Team Lead, HMP review.
Darrell Christenson	Acting Fire Chief	City of Eagle	Planning Team Member, data input and HMP review.
Steve Hamilton	Director, Public Works	City of Eagle	Planning Team Member, data input and HMP review.
Members	City Council	City of Eagle	Planning Team Member, Tribal data input and HMP review.
Joyce Roberts	Tribal Administrator	Native Village of Eagle	Planning Team Member, Tribal data input and HMP review.
Members	Tribal Council	Native Village of Eagle	Planning Team Member, Tribal data input and HMP review.
Scott Simmons	Emergency Management, Hazard Mitigation, and Climate Change Planner	URS Corporation, Alaska	Temporary Team Member, Responsible for HMP development, lead writer, project coordination.

3.3 PUBLIC INVOLVEMENT & OPPORTUNITY FOR INTERESTED PARTIES TO PARTICIPATE

URS extended an invitation to all individuals and entities identified on the project mailing list described the planning process and announced the upcoming communities' planning activities. The announcement was emailed to relevant academia, nonprofits, and local, state, and federal agencies on August 6, 2013. The following agencies were invited to participate and review the HMP:

- University of Alaska Fairbanks, Geophysical Institute, Alaska Earthquake Information Center (UAF/GI/AEIC)
- Alaska Native Tribal Health Consortium-Community Development (ANTHC)
- Alaska Volcano Observatory (AVO)
- Association of Village Council Presidents (AVCP)
- Denali Commission
- Alaska Department of Environmental Conservation (DEC)
- DEC Division of Spill Prevention and Response (DSPR)
- DEC Village Safe Water (VSW)
- Alaska Department of Transportation and Public Facilities (DOT/PF)
- Alaska Department of Community, Commerce, and Economic Development (DCCED)
- DCCED, Division of Community Advocacy (DCRA)
- Alaska Department of Military and Veterans Affairs (DMVA)
- DMVA, Division of Homeland Security and Emergency Management (DHS&EM)
- US Environmental Protection Agency (EPA)

- National Weather Service (NWS) Northern Region
- NWS Southeast Region
- NWS Southcentral Region
- Natural Resources Conservation Service (NRCS)
- US Department of Agriculture (USDA)
- USDA Division of Rural Development (RD)
- US Army Corps Of Engineers (USACE)
- US Bureau of Indian Affairs (BIA)
- US Bureau of Land Management (BLM)
- US Department of Housing and Urban Development (HUD)
- US Fish & Wildlife Service (USFWS)

Table 3-2 lists the community's public involvement initiatives focused to encourage participation and insight for the HMP effort.

Table 3-2 Public Involvement Mechanisms

Mechanism	Description
Newsletter #1 Distribution (August 2013)	In August 2013, the jurisdiction distributed a newsletter introducing the upcoming planning activity. The newsletter encouraged the whole community to provide hazard and critical facility information. It was posted at City Offices, bulletin boards, stores, and DHS&EM's websites to enable the widest dissemination.
Agency Involvement eMail (August 6, 2013)	Invited agencies to participate in mitigation planning effort and to review applicable newsletters located on the DHS&EM Local/Tribal All Hazard Mitigation Plan Development website at: http://ready.alaska.gov/plans/localhazmitplans.htm
Newsletter #2 Distribution (February, 2014)	In February, 2014, the jurisdiction distributed a newsletter describing the HMPs availability and present potential HMP projects for review. The newsletter encouraged the whole community to provide comments or input. It was posted at the City and Tribal Offices and community bulletin boards to ensure everyone was aware of the HMP review process.

Initial contact was made with Mayor Woodruff on July 15, 2013; he was enthusiastic that the City of Eagle was included within DHS&EM's Pre-Disaster Mitigation grant and the prospects of completing the hazard mitigation plan. URS introduced the hazard mitigation planning project and introductory newsletter during the August, 2013 describing the planning process.

The newsletter was placed on the DSH&EM website and posted throughout the community (the City and Tribal office, US Post Office, and public bulletin boards) announcing the HMP Planning initiative.

The Planning Team identified six natural hazards: earthquake, erosion, flood, ground failure, severe weather, and wildland fire which periodically impact the City.

URS described the specific information needed from the Planning Team to assess critical facility vulnerability and population risk by the location, value, and population within residential properties and critical facilities.

The risk assessment was completed after the community asset data was collected by the Planning Team during 2013, which identified the assets that are exposed and vulnerable to specific hazards.

The Planning Team evaluated these facilities and their associated risks to facilitate creating a viable or realistic risk analysis and subsequent vulnerability assessment for Eagle and the neighboring Eagle Village.

The City held a project review and selection meeting in January, 2014; the Tribal Administrator held a project review and selection meeting in February 2014 to select and prioritize the mitigation actions identified based on the results of the risk assessment. A second newsletter was prepared and delivered in February, 2014 describing the process to date, presenting the prioritized mitigation actions, and announcing the availability of the draft HMP for public review and comment.

The City and Village held a special meeting in February, 2014 to review the draft HMP for accuracy – ensuring it meets the City and Village's needs. The meeting was productive with the Team highlighting several minor corrections or refinements. Changes were specifically targeted to plan development information, hazard impacts, community vulnerability analysis, and the mitigation strategy.

3.4 INCORPORATION OF EXISTING PLANS AND OTHER RELEVANT INFORMATION

During the planning process, the Planning Team reviewed and incorporated information from existing plans, studies, reports, and technical reports into the HMP. The following documents were available and were reviewed with references sited for the City and Village's hazard profiles in the HMP's risk assessment (Table 3-3).

Table 3-3 Documents Reviewed

Existing plans, studies, reports, ordinances, etc.	Contents Summary (How will this information improve mitigation planning?)
US Army Corps of Engineers, Alaska Baseline Erosion Assessment, 2009	Provided statewide erosion data and categorical definitions.
US Army Corps of Engineers, Erosion Information Paper – Eagle City and Eagle Village	Defined the City of Eagle and Eagle Village's erosion threats
US Army Corps of Engineers, Floodplain Manager's Reports, Community Specific 2011	Defined the area's historical flood impacts
State of Alaska, Department of Commerce, Community and Economic Development Community Profile	Provided historical and demographic information
State of Alaska Hazard Mitigation Plan (SHMP), 2010	Defined statewide hazards and their potential locational impacts

A complete list of references list is provided in Section 8.

3.5 PLAN MAINTENANCE

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:

1. Implementation into existing planning mechanisms
2. Continued public involvement
3. Monitoring, reviewing, evaluating, and updating the HMP

3.5.1 Implementation Into Existing Planning Mechanisms

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

DMA 2000 Requirements
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.

Once the HMP is community adopted and receives FEMA's final approval, Each Planning Team Member ensures that the HMP, in particular each Mitigation Action Project, is incorporated into existing planning mechanisms whenever possible. Each member of the Planning Team has 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

3.5.2 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

DMA 2000 Requirements
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 is dedicated to involving the public directly in the continual reshaping and updating 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 whom people can direct their comments or concerns will also be available at the City Office.

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

3.5.3 Monitoring, Reviewing, Evaluating, and Updating the HMP

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

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.

This section provides an explanation of how the City of Eagle'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:

1. Review and revise the HMP to reflect development changes, project implementation progress, project priority changes, and resubmit
2. HMP resubmittal at the end of the plan's five year life cycle for State and FEMA review and approval

3. Continued mitigation initiative implementation

3.5.3.1 Monitoring the HMP

The HMP was prepared as a collaborative effort. To maintain momentum and build upon previous hazard mitigation planning efforts and successes, the City will continue to use the Planning Team to monitor, review, evaluate, and update the HMP. Each authority identified in the Mitigation Action Plan (MAP) matrix (Table 7-8) will be responsible for implementing the Mitigation Action Plan and determining whether their respective actions were effectively implemented. The Director of Public Safety, the hazard mitigation Planning Team Leader, (or designee), will serve as the primary point of contact and will coordinate local efforts to monitor, evaluate, revise, and tabulate HMP actions' status.

3.5.3.2 Reviewing the HMP

The City will review their success for achieving the HMP's mitigation goals and implementing the Mitigation Action Plan's activities and projects during the annual review process.

During each annual review, each agency or authority administering a mitigation project will submit a Progress Report (Appendix F) to the Planning Team. The report will include the current status of the mitigation project, including any project changes, a list of identified implementation problems (with an appropriate strategies to overcome them), and a statement of whether or not the project has helped achieve the appropriate goals identified in the plan.

3.5.3.3 Evaluating the HMP

The Annual Review Questionnaire (Appendix F) provides the basis for future HMP evaluations by guiding the Planning Team with identifying new or more threatening hazards, adjusting to changes to, or increases in, resource allocations, and garnering additional support for HMP implementation.

The Planning Team Leader will initiate the annual review two months prior to the scheduled planning meeting date to ensure that all data is assembled for discussion with the Planning Team. The findings from these reviews will be presented at the annual Planning Team Meeting. Each review, as shown on the Annual Review Worksheet, will include an evaluation of the following:

- Determine City authorities, outside agency, stakeholders, and resident's participation in HMP implementation success
- Identify notable risk changes for each identified and newly considered natural or human-caused hazards
- Consider land development activities and related programs' impacts on hazard mitigation
- Mitigation Action Plan implementation progress (identify problems and suggest improvements as necessary)
- Evaluate HMP local resource implementation for HMP identified activities

3.5.3.4 *Updating the HMP*

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.

The City of Eagle will annually review the HMP as described in Section 3.5.3.2 and update the HMP every five years (or when significant changes are made) by having the identified Planning Team review all Annual Review Questionnaires (Appendix F) to determine the success of implementing the HMP's Mitigation Action Plan.

The Annual Review Questionnaire will enable the Team to identify possible changes in the HMP Mitigation Action Plan by refocusing on new or more threatening hazards, resource availability, and acquiring stakeholder support for the HMP project implementation.

No later than the beginning of the fourth year following HMP adoption, the Planning Team will undertake the following activities:

- Request grant assistance from DHS&EM to update the HMP (this can take up to one year to obtain and one year to update the plan)
- Ensure that each authority administering a mitigation project will submit a Progress Report to the Planning Team
- Develop a chart to identify those HMP sections that need improvement, the section and page number of their location within the HMP, and describing the proposed changes
- Thoroughly analyze and update the natural hazard risks
    - Determine the current status of the mitigation projects
    - Identify the proposed Mitigation Plan Actions (projects) that were completed, deleted, or delayed. Each action should include a description of whether the project should remain on the list, be deleted because the action is no longer feasible, or reasons for the delay
    - Describe how each action's priority status has changed since the HMP was originally developed and subsequently approved by FEMA

- Determine whether or not the project has helped achieve the appropriate goals identified in the plan
- Describe whether the community has experienced any barriers preventing them from implementing their mitigation actions (projects) such as financial, legal, and/or political restrictions and stating appropriate strategies to overcome them
- Update ongoing processes, and to change the proposed implementation date/duration timeline for delayed actions the City of Eagle still desires to implement
- Prepare a "new" MAP matrix for the City of Eagle

- Prepare a new Draft Updated HMP
- Submit the updated draft HMP to the Division of Emergency Management (DHS&EM) and FEMA for review and approval

3.5.3.5 Formal State and FEMA HMP Review

Completed Hazard Mitigation Plans do not qualify the City of Eagle for mitigation grant program eligibility until they have been reviewed and adopted by the City Council, and received State and FEMA final approval.

The Native Village of Eagle, as a participant, provided signatory evidence it intends to follow and implement applicable tribal activities to qualify them for applicable tribal grant opportunities.

The City of Eagle will submit the draft HMP to the Division of Emergency Management (DHS&EM) for initial review and preliminary approval. Once any corrections are made, DHS&EM will forward the HMP to FEMA for their review and conditional approval.

Once the plan has fulfilled all FEMA criteria, the City will pass an HMP Adoption Resolution. A copy will be sent to FEMA for final HMP approval.

FEMA's final approval assures the City is eligible for applying for appropriate mitigation grant program funding. URS will send a final copy of the FEMA approved HMP to the City of Eagle.

4

PLAN ADOPTION

Section Four describes the community's HMP adoption process

4.1 ADOPTION BY LOCAL GOVERNING BODIES AND SUPPORTING DOCUMENTATION

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

DMA 2000 Requirements
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 Eagle is represented in this HMP and meets the requirements of Section 409 of the Stafford Act and Section 322 of DMA 2000, and 44 CFR §201.6(c)(5).

The Eagle City Council adopted the HMP on September 16, 2014 and submitted the final draft HMP to FEMA for formal approval.

A scanned copy of the City's formal adoption is included in Appendix C.

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Section Five identifies and profiles the hazards that could affect the City of Eagle and the Native Village of Eagle.

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 historical and anecdotal information collection, existing plans, studies, and map reviews, and study area hazard map preparations when appropriate. Hazard maps are used to define a hazard's geographic extent as well as define the approximate risk area boundaries.

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

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

For the first step of the hazard analysis, on July 15, 2013 the City and Village reviewed eight possible hazards that could affect the Alaska Gateway REAA. 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

(Table 5-1). The Planning Team determined that seven hazards pose a great threat to the City: earthquake, erosion, flood, ground failure, severe weather, and wildland fire.

Table 5-1 Identification and Screening of Hazards

Hazard Type	Should It Be Profiled?	Explanation
Natural Hazards		
Earthquake	Yes	Periodic, unpredictable occurrences. The City of Eagle (City) and the Native Village of Eagle (Village) experienced no damage from the 11/2003 Denali EQ, but experienced minor shaking from the earthquake and its aftershocks, from the 1964 Good Friday Earthquake.
Erosion	Yes	The City experiences riverine erosion along the Yukon River embankment from high water flow, riverine ice flows, wind, surface runoff, and boat traffic wakes. The Villages states there are many facilities ranging from 50 to 150 feet from the embankment. However, they are beginning to develop land 5 miles from the river.
Flood	Yes	Snowmelt run-off and rainfall flooding occurs during spring thaw and the fall rainy season. Events are exacerbated from soil saturation, ice jam flooding. Several minor flood events cause damage. Severe damages occur from major floods such as the 2009 Spring Ice Jam Flood which damage and destroyed several homes along the river.
Ground Failure (Avalanche, Landslide/Debris Flow, Permafrost, Subsidence)	Yes	Ground Failure occurs throughout Alaska from avalanches, landslides, and melting permafrost. However subsidence and permafrost are the primary hazards causing houses to shift due to ground sinking and upheaval.
Severe Weather (Cold, Drought, Rain, Snow, Wind, etc.)	Yes	Annual weather patterns, severe cold, heavy rain, freezing rain, snow accumulations, storm surge, and wind, 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 and moved houses off their foundations.
Tsunami (Seiche)	No	This hazard does not exist for this location.
Volcano (Ashfall)	No	This hazard does not exist for this location.
Wildland Fire	Yes	The City and the surrounding area become very dry in summer months with weather (such as lightening) and human caused incidents igniting dry vegetation in the adjacent area (burning trash outside their landfill's burn box).

5.3 HAZARD PROFILE

The requirements for hazard profiles, as stipulated in DMA 2000 and its implementing regulations 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 for profiling have been examined in a methodical manner based on the following factors:

- Nature (Type)
- History (Previous Occurrences)
- Location
- Extent (to include magnitude and severity)
- Impact (Section 5 provides general impacts associated with each hazard. Section 6 provides detailed impacts to Eagle and Eagle Village's residents and critical facilities)
- Probability of future events

NFIP insured Repetitive Loss Structures (RL) are addressed in Section 6.0, Vulnerability Analysis.

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

Estimating magnitude and severity are determined based on historic events using the criteria identified in the introductory narrative description of Section 5.3.

Table 5-2 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.

Similar to estimating magnitude and severity, Probability is determined based on historic events, using the criteria identified above, to provide the likelihood of a future event (Table 5-3).

Table 5-3 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 20 percent 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 to occur.

The hazards profiled for the City of Eagle are presented throughout the remainder of Section 5.3. The presentation order does not signify their importance or risk level.

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 extensive casualties. The most common effect of earthquakes is ground motion, or the vibration or shaking of the ground during an earthquake.

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

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

Surface Faulting is the differential movement of two sides of a fault at the earth's surface. Displacement along faults, both in terms of length and width, varies but can be significant (e.g., up to 20 feet [ft]), as can the length of the surface rupture (e.g., up to 200 miles). Surface faulting can cause severe damage to linear structures, including railways, highways, pipelines, and tunnels.

Liquefaction occurs when seismic waves pass through saturated granular soil, distorting its granular structure, and causing some of the empty spaces between granules to collapse. Pore water pressure may also increase sufficiently to cause the soil to behave like a fluid for a brief period and cause deformations. Liquefaction causes lateral spreads (horizontal movements of commonly 10 to 15 ft, but up to 100 ft), flow failures (massive flows of soil, typically hundreds of 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 shallow, disrupted landslides such as rock falls, rockslides, and soil slides. Debris flows are created when surface soil on steep slopes becomes totally saturated with water. Once the soil liquefies, it loses the ability to hold together and can flow downhill at very high speeds, taking vegetation and/or structures with it. Slide risks increase after an earthquake during a wet winter.

The severity of an earthquake can be expressed in terms of intensity and magnitude. Intensity is based on the damage and observed effects on people and the natural and built environment. It varies from place to place depending on the location with respect to the earthquake epicenter, which is the point on the earth's surface that is directly above where the earthquake occurred. The severity of intensity generally increases with the amount of energy released and decreases

with distance from the fault or epicenter of the earthquake. The scale most often used in the U.S. to measure intensity is the Modified Mercalli 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. 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) (MMI 2006).

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

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

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

(MMI 2006)

5.3.1.2 History

The Project Team determined that the City of Eagle has a minor concern for earthquake damages as they have not experienced damaging impacts from their historical earthquake events and stated they only need to be concerned with earthquakes with a magnitude > M5.0. This is substantiated in Table 5-5 which lists historical earthquakes. Research included searching the US Geological Survey (USGS) earthquake database for events spanning from 1973 to present. Of the 89 recorded earthquake events, none of them exceeded M5.0 located within 100 miles of the City.

Table 5-5 Historical Earthquakes Within 100 Miles of Eagle

DATE	TIME	LAT	LON	DEP	MAG
3/11/2013	9:58:09 PM	60.368	-162.184	22.6	3.4
2/23/2013	2:35:34 AM	60.357	-162.454	0.5	4.7
6/1/2010	5:31:32 PM	61.037	-160.863	27.8	3.5
8/3/2008	10:39:18 PM	62.599	-162.732	10	2.9
4/13/2008	5:44:36 PM	63.043	-163.001	19.4	2.7

(USGS 2012)

North America's strongest recorded earthquake occurred on March 27, 1964 in Prince William Sound measuring M9.2 and was felt by many residents throughout Alaska. Eagle experienced minor ground motion from this historic event.

Planning Team members stated that Eagle and Eagle Village experienced moderate ground shaking from the November 3, 2002 M7.9 Denali EQ but experienced no damaging impacts.

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

Location

The entire geographic area of Alaska is prone to earthquake effects such as the City and Native Village of Eagle. Figure 5-1 shows the locations of USGS identified active and potentially active faults in Alaska.

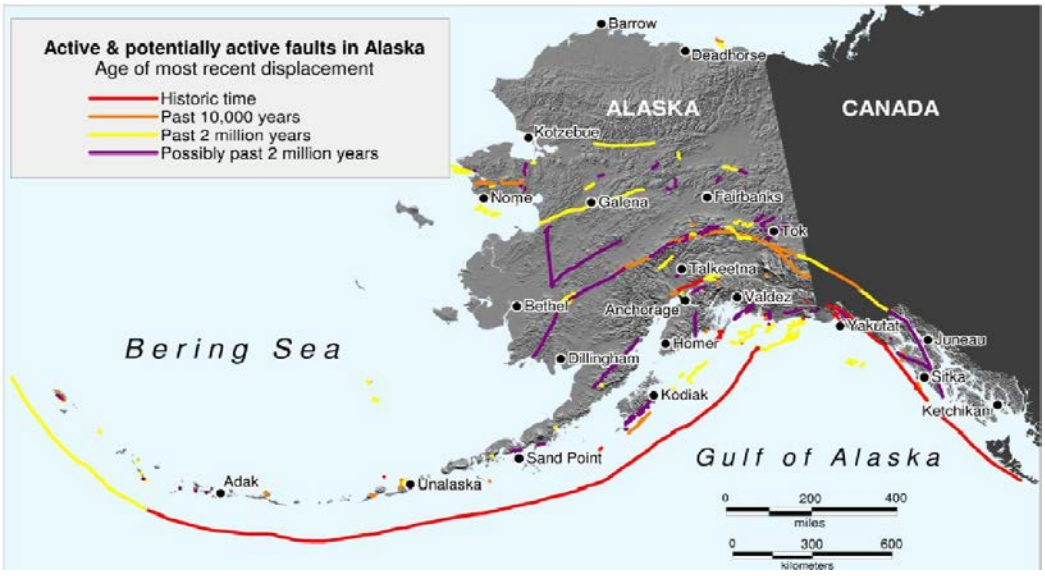

Figure 5-1 Active and Potentially Active Faults in Alaska

Figure 5-2 depicts the known faults within 150 miles of the City and Village of Eagle

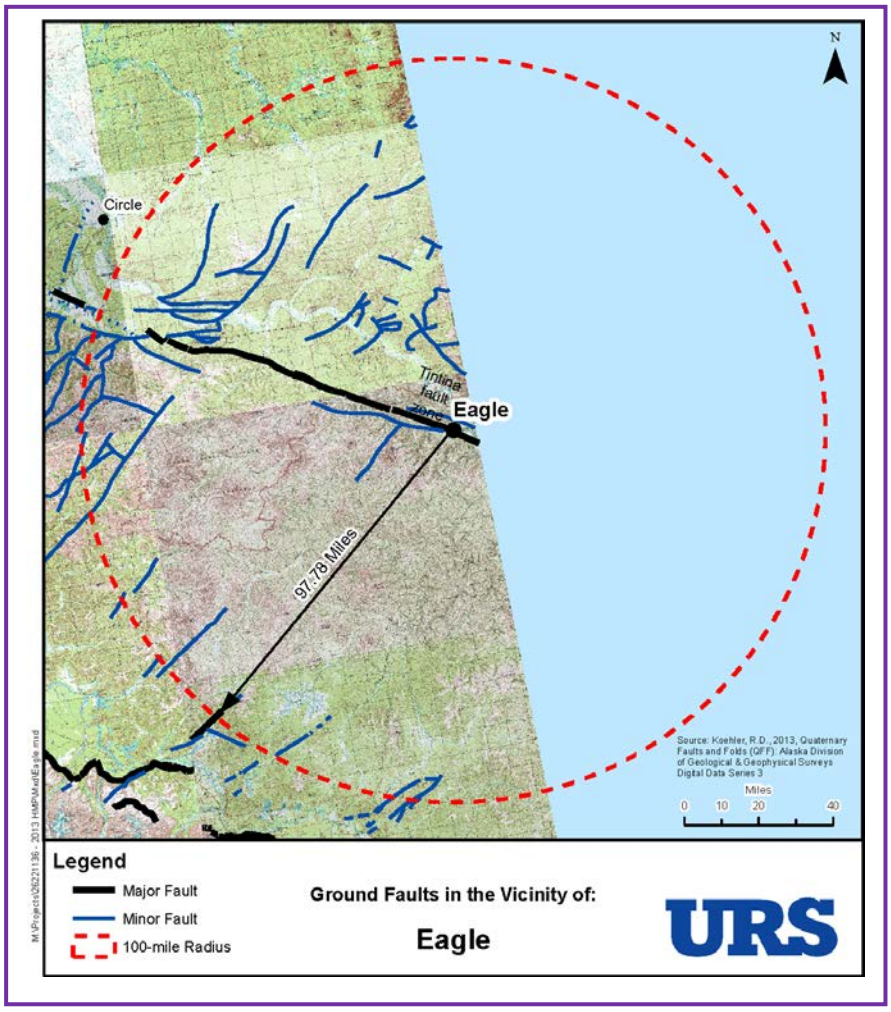

Figure 5-2 Eagle Vicinity EQ Faults (URS 2013)

Extent

The Tintina Fault traverses directly through the City and Native Village of Eagle. The nearest distance to the next largest (but unnamed) fault is 97.78 miles.

Based on historic earthquake events and the criteria identified in Table 5-2, the magnitude and severity of earthquake impacts in the City and Village are considered "Negligible" where injuries and/or illnesses are treatable with first-aid; critical facilities could expect to be shut-down for 24 hours or less; and less than 10 percent of property is severely damaged. There is very little potential for long-term damage to transportation, infrastructure, or the economy.

Impact

Alaska is located adjacent to the "Ring of Fire" which is more seismically active than the majority of the State. Impacts to the community such as significant ground movement that may result in infrastructure damage are not. Minor shaking may be seen or felt based on past events. Impacts to future populations, residences, critical facilities, and infrastructure are anticipated to remain the same.

Probability of Future Events

The Eagle area has received 89 very small earthquakes since 1937; none of which exceeded M5.0. The City and Native Village have determined earthquakes are a minor threat where infrastructure is unlikely to receive significant damages that would result in city isolation from emergency response and critically needed assistance.

This 2009 Shake Map incorporates current seismicity in its development and is the most current map available for this area. Peter Haeussler, USGS, Alaska Region states, it is a viable representation to support probability inquiries.

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

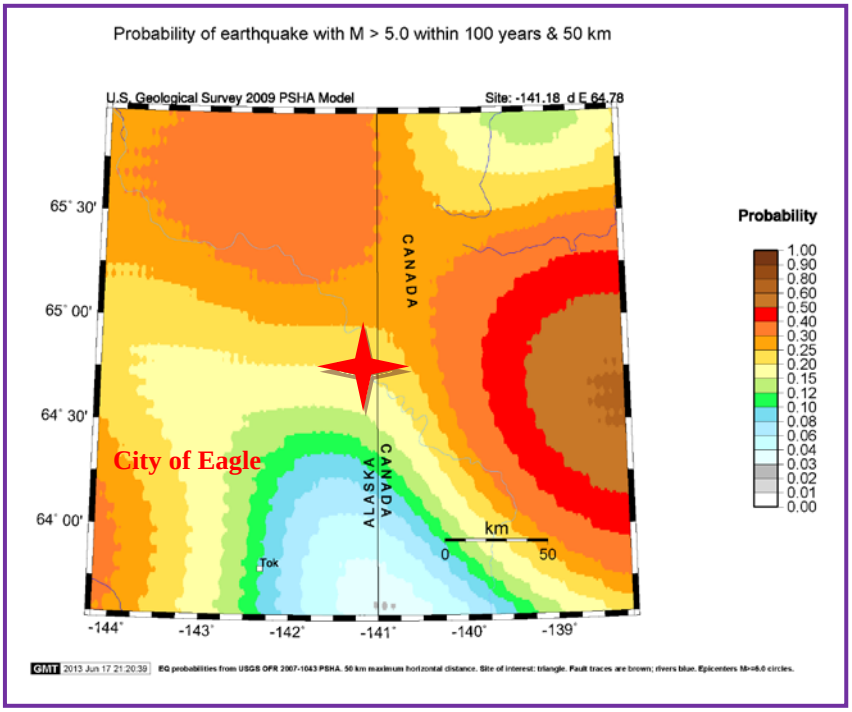

Figure 5-3 City of Eagle Earthquake Probability (USGS 2013)

As indicated in Figure 5-3, earthquake recurrence probability is rated "Likely." An event which exceeds M 5.0 is probable within a 1 in 3 year chance of occurring (1/3=33 percent) as the earthquake event history is greater than 20 percent but less than 33 percent likely per year.

5.3.2 Erosion

5.3.2.1 Nature

Erosion rarely causes death or injury. However, erosion causes property destruction, prohibits development, and impacts community infrastructure. Erosion is typically gradual land loss through wind or water scour. However, erosion can occur rapidly as the result of floods, storms or other event or slowly as the result of long-term environmental changes such as melting permafrost. Erosion is a natural process, but its effects can be easily exacerbated by human activity.

Riverine erosion is a major threat to the City as it threatens the embankment, structures, and utilities of the City's and adjacent Village's residents.

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

Attempts to control erosion using shoreline protective measures such as groins, jetties, levees, or revetments can lead to increased erosion.

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

The Army Corp of Engineers (USACE) completed an erosion survey concurrently for the City and Native Village of Eagle during their 2009 Baseline Erosion Assessment. The report listed the communities as having a "Monitor Conditions" erosion threat. The Erosion Information Paper – Eagle City and Eagle Village, Alaska, Current as of January 21, 2008 stated

> *"City of Eagle. Ice formation and melting, ice jams in the spring, river flow, wind, gully runoff during swift spring thaws over the bluff, and high river stages all contribute to bank erosion on the Yukon River. Notable erosion was reported by the city for 1927, 1934, 1972 and 1992. Prior to 1994, an estimated 75 feet had been lost off the end of the runway and the old U.S. Army parade grounds for Fort Egbert over a 40 year period.*
>
> *Village of Eagle. Ice jams from spring break up are the primary cause of bank erosion. The eroding area is estimated to be 1,690 feet in length with the height of the eroding bank estimated at 25 to 40 feet. The old village area was in the 40-year floodplain where slow erosion continues to occur, however a new community development has begun to take place 5 miles back from the river. The risk from river bank erosion is reportedly low and the bank has not eroded much in recent years" (USACE 2008).*

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

Location

The USACE 2008 report described the communities' erosion locations:

"Village of Eagle. Several residences, some outbuilding and sheds, the community well house, Charlie's Hall community building, Front Road, the clinic, the tribal work force office, the church, and the remains of the historic school house are all estimated at 1ess than 100 feet from the top of the bank. Items identified farther back from the river include fuel storage tanks, and a junk yard behind the clinic. A site of archeological importance along Mission Creek and Eagle Bluff is an estimated 50 feet from the river bank. No protection measures have been implemented to reduce potential erosion damage, however several old buildings have reportedly been moved in past years.

Photo 1: In Eagle village some homes are located close to the Yukon River shoreline; photo courtesy of the Division of Homeland Security and Emergency Management, 2001.

City of Eagle. An approximately 950-foot-long sheet pile retaining wall was installed in 1994, which reduced the erosion rate in the area. Six hundred feet of riverbank downstream from the end of the sheet pile is currently eroding, however the upstream end of the sheet pile appears to be controlling the erosion. … Structures and facilities presently threatened by the approximately 600-foot eroding area along the river bank downstream from the sheet pile structure include the Episcopal Church, the airstrip, and the National Park Service Yukon-Charley Rivers National Preserve headquarters buildings.

[Photo 2 depicts the City's protective sheet pile.]

Photo 2: Sheet pile retaining wall along the city of Eagle shoreline protects the bank from erosion. The unprotected high bluff area is in the background, beyond the end of the sheet pile wall; photo courtesy of the Division of Homeland Security and Emergency Management, 2001"(USACE 2008).

Extent

A variety of natural and human-induced factors influence the erosion process within the community. Coastal orientation and proximity to ocean waves, currents, and storm surges can influence erosion rates. Embankment composition also influences erosion rates, as sand and silt will erode easily, whereas boulders or large rocks are more erosion resistant. Other factors that may influence coastal erosion include:

- Embankment type
- Geomorphology
- Structure types along the embankment
- Amount of encroachment within the high hazard zone
- Proximity to erosion inducing riverine structures
- Nature of the topography
- Development density
- Elevation of coastal dunes and bluffs/ shoreline
- Shoreline exposure to wind and waves

The USACE Erosion Information Paper-Eagle City and Eagle Village, Alaska, January 21, 2008 provided a diagram for both the City and the Village to depict the “linear extent in the [C]ity [Figure 5-4] and [V]illage [Figure 5-5]…”

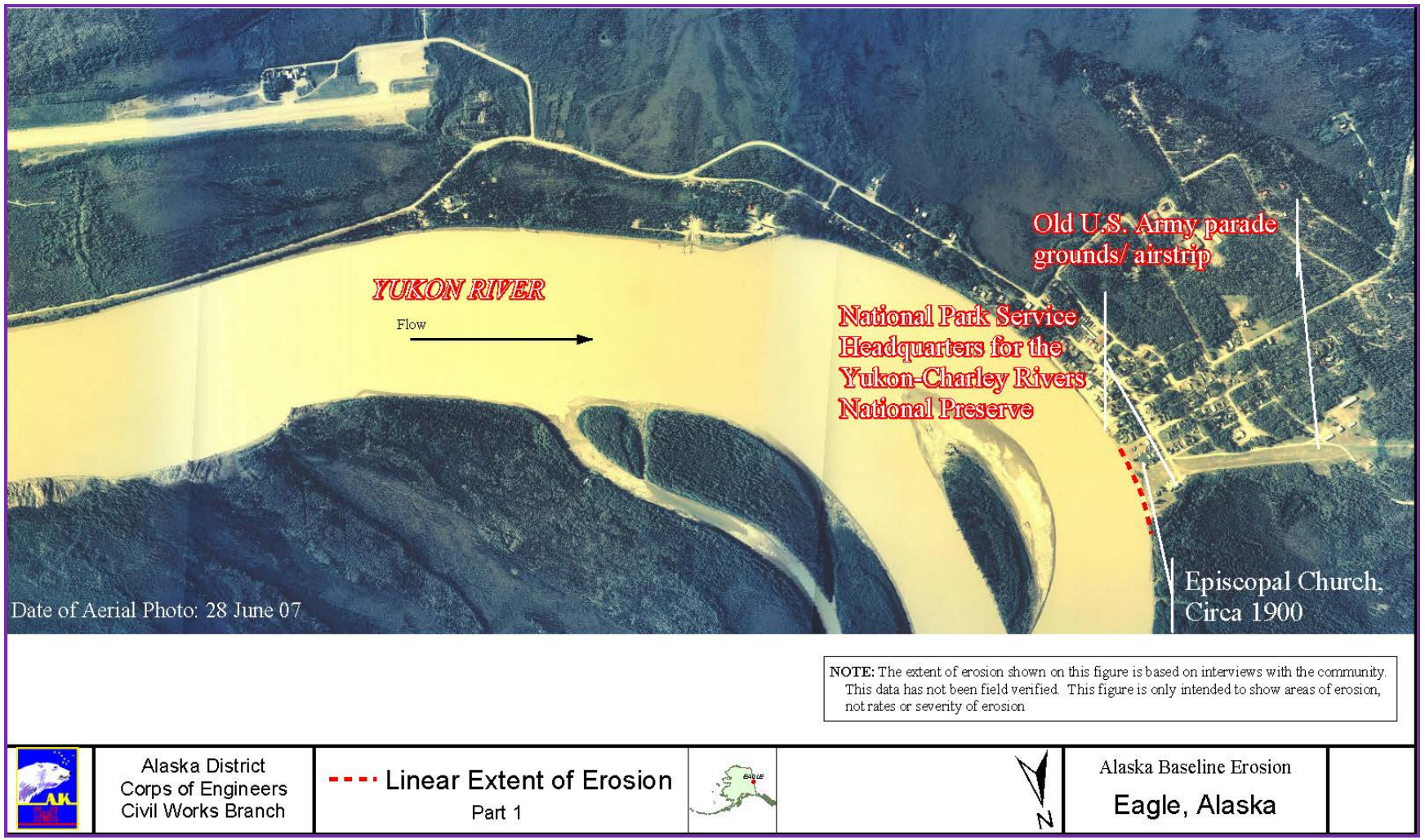

Figure 5-4 USACE Linear Extent of Erosion for the City of Eagle (USACE 2008)

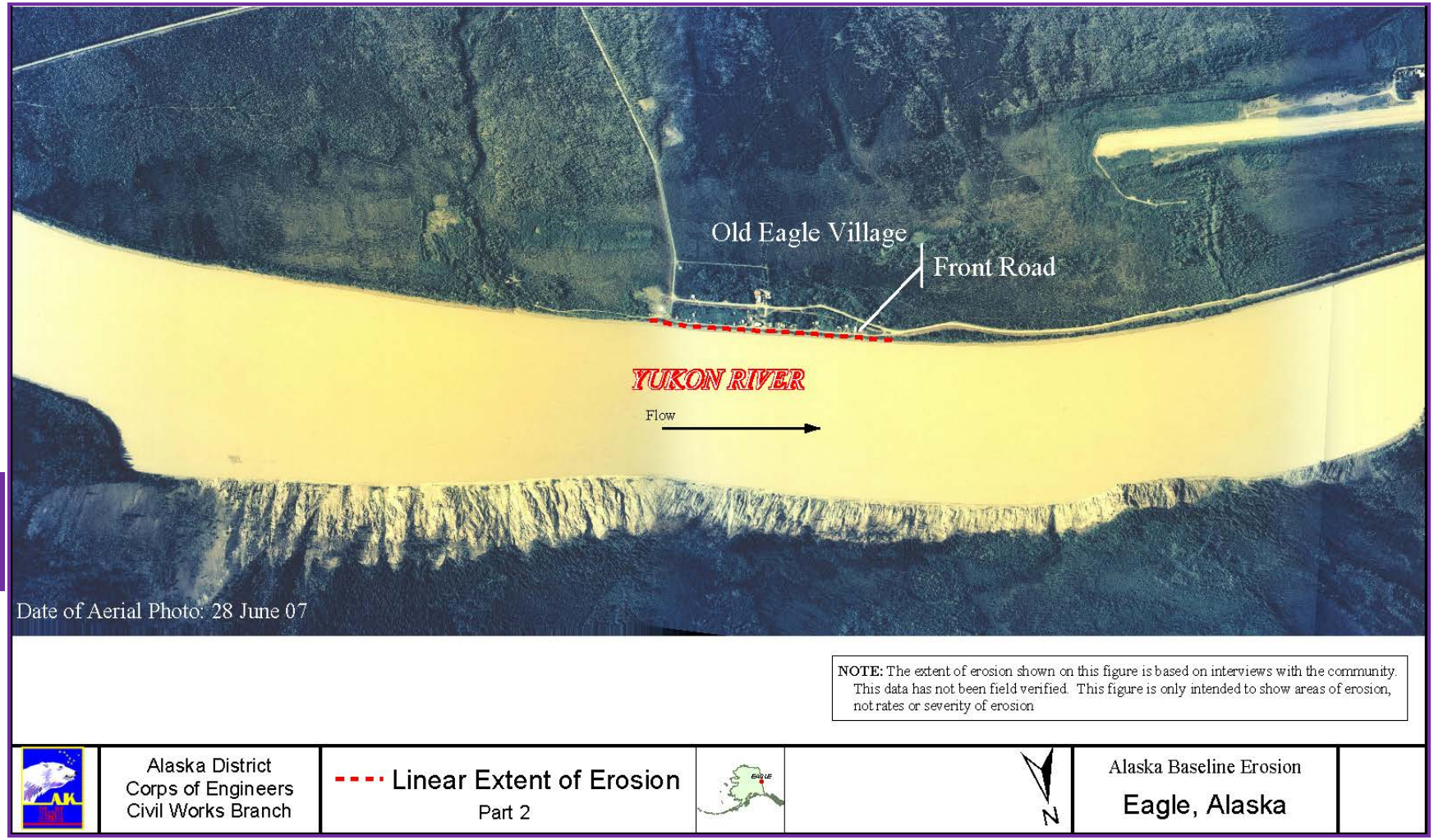

Figure 5-5 USACE Linear Extent of Erosion for the Native Village of Eagle (USACE 2008)

Based on the USACE Erosion Information Paper-Eagle City and Eagle Village, Alaska, January 21, 2008's, past erosion events, and the criteria identified in Table 5-2, the magnitude and severity of erosion impacts in the City are considered "Limited" due to their protective sheet piling. However, with potential for critical facilities to be shut down for less than a week with less than 10 percent of property or critical infrastructure being severely damaged.

However, the Native Village of Eagle's erosion impact potential is considered "Critical" with potential for critical facilities to shut down for at least two weeks, with more than 25 percent of property is severely damages.

Impact

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

Probability of Future Events

Based on historical impacts and the criteria identified in Table 5-3, it is likely that erosion will impact both the City of Eagle and the Village in the next three years as an event has up to 1 in 3 years (1/3=33 %) chance of occurring as the history of events is greater than 20 percent but less than or equal to 33 percent likely per year.

5.3.3 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. 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.

Flood events not only impact communities with high water levels, or fast flowing waters, but sediment transport also impacts infrastructure and barge and other river vessel access limitations. Dredging may be the only option to maintain an infrastructure's viability and longevity.

Four primary types of flooding occur in the City: rainfall-runoff, snowmelt, storm surge, and ice override floods.

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-Jam floods occur when warming temperatures and rising water flows causes the ice to break-up and disconnect from the embankment. The large ice chunks begin to flow and move down river. The ice does not flow easily, often impacting with adjacent blocks resulting in occasional ice jams. Some ice jams quickly break apart, however, larger jams occur which create small dams causing the water to exert increasing pressure on the jam creating a damming effect. Water subsequently begins to build depth and often overtops adjacent embankments which flood upstream communities.

When the ice-jam breaks the built-up water rushes downstream with great force. Ice blocks scour the embankment, destroying infrastructure such as fuel headers, barge landings, and boat mooring structures. Large house sized ice blocks may even be driven above the embankment destroying any structure in its path. Communities are virtually helpless against such devastation.

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 and breaks up winter ice cover, which causes localized ice-jam floods.

5.3.3.2 History

The City experiences severe ice jam impact damages and erosion from heavy rainfall, snowmelt, spring run-off, and ice jam flooding. Ice-jam impacts and subsequent flooding causes the most damages to the community's infrastructure.

The DHS&EM Disaster Cost Index delineates historical flood events affecting the City. The index lists the following events:

> ***153. Eagle City, May 19, 1992.*** *On May 13, 1992, the ice jam precipitating the Eagle Village flood moved down to the City of Eagle flooding some private property and destroying an erosion control structure along the river front street. Both the public assistance and individual assistance programs were implemented as well as the SBA disaster loan program.*
>
> ***154. Eagle Village, May 19, 1992.*** *On May 12 through 13, the Native Village of Eagle was inundated by ice jam flooding causing the entire town to be evacuated to local high ground. Flood waters caused damage to a majority of the homes, eroded the river front street and caused damage to the clinic, washeteria and tank farm. Both the public assistance and individual assistance programs were implemented as well as the SBA disaster loan program.*
>
> ***09-227 2009 Spring Flood declared by Governor Palin on May 6, 2009 then FEMA declared under DR-1843 on June 11, 2009.*** *Extensive widespread flooding due to snow melt and destructive river ice jams caused by rapid spring warming combined with excessive snow pack and river ice thickness beginning April 28, 2009 and continuing. The ice jams and resultant water backup along with flood waters from snow melt left a path of destruction along 3,000 miles of interior rivers, destroying the Native Village of Eagle and forcing the evacuation of multiple communities. The following jurisdictions and communities in Alaska have been impacted: Alaska Gateway Rural Regional Educational Attendance Area (REAA) including the City of Eagle and Village of Eagle; the Copper River REAA including the Village Community of Chisotchina; the*

Matanuska-Susitna Borough; the Yukon Flats REAA including the City Community of Circle, and City of Fort Yukon, the Villages Communities of Chalkyistik, Beaver, Stevens Village, and Rampart; the Yukon-Koyukuk REAA including the Cities of Tanana, Ruby, Galena, Koyukuk, Nulato, and Kaltag; the Iditarod Area REAA including the Cities of McGrath, Grayling, Anvik, and Holy Cross; the Northwest Arctic Borough including the Cities of Kobuk, and Buckland; the Lower Yukon REAA including the Cities of Russian Mission, Marshall, Saint Mary's, Mountain Village, Emmonak, Alakanuk and Pilot Station and the Community of Ohogamiut; the Lower Kuskokwim REAA including the Cities of Bethel, Kwethluk, Napakiak, Napaskiak, and the Village Community of Oscarville; the Yupiit REAA including the City of Akiak, and the Villages of Akiachak, and Tuluksak; the Kuspuk REAA including the Cities of Aniak, Upper Kalskag, Lower Kalskag, and the Villages Communities of Stony River, Sleetmute, Red Devil, Crooked Creek, and Napaimute; the Fairbanks North Star Borough including the City of North Pole and Community of Salcha; the Bering Strait REAA including the City of Nome area.

10-231 2010 July Interior Flooding declared by Governor Parnell on July 26, 2010. *Beginning on July 10, 2010 and continuing through at least July 13, 2010, heavy rainfall through the Upper Tanana and Yukon River Basins caused severe flooding along several creeks along the Taylor Highway, Nabesna Road and the Alaska Highway. The damages are located within the Alaska Gateway Rural Education Attendance Area (REAA 3) and the Copper River Rural Education Attendance Area (REAA 11). There are no official jurisdictions in the areas.*

Heavily damaged areas are primarily between MP 64 near Chicken MP 160 in Eagle. Damages include: landslides, washouts, erosion and bridge abutment and culvert damage. Minor damages are flood related on the Tok Cutoff at MP 123 and the Alaska Highway at MP 164.

12-242 2013 Spring Floods declared by Governor Parnell on May 30, 2013 then FEMA declared on June 25, 2013 (DR-4122). *Beginning on May 17, through June 10 2013, excessive snow pack and ice thickness, combined with rapid spring warming caused ice jams and severe flooding. The following jurisdictions and communities in Alaska have been impacted: Alaska Gateway Rural Regional Educational Attendance Area (REAA) including the City and Village of Eagle; the Copper River REAA including the Village Communities of Chisotchina and Gulkana; the Yukon Flats REAA including the Community of Circle, and City of Fort Yukon; the Yukon-Koyukuk REAA including the Cities of Galena; the Lower Yukon REAA including the Cities of Emmonak and Alakanuk. The impact of the flooding resulted in severe damage to approximately 194 homes (requiring evacuations and sheltering) to include loss and damage to personal property, multiple businesses (including loss of revenue), and public infrastructure to include: hazardous and non-hazardous debris removal, emergency protective measures (leading to ongoing mass care operations), damage to city and state roads, bridges, water and sewer systems, electrical generation and distribution systems, recreation areas and fuel storage facilities.*

The US Army Corp of Engineers Floodplain Manager's October 2011 report stated:

"*Most of the town is on a bluff. The airstrip is on high ground. In May 1962, an ice jam caused flooding to an elevation of 35.94 ft, with 70 percent of the town damaged. On June 12, 1964, an open water flood reached an elevation of 33.85 ft, with 60 percent damages. The 1937 flood was reported to have caused water depths of up to 5 ft. In May*

2009, a high water mark was located 7.5 feet above the concrete slab of the fire station building" (USACE 2011).

The USACE and the National Weather Service (NWS) provided flood impact data both the City of Eagle and Native Village of Eagle contained in Table 5-6.

The May 2009 ice jam flood is the worst flood event for both the City of Eagle and Eagle Village. Eagle Village was totally destroyed by this event.

Table 5-6 Historic Flood Events (NWS)

Location	Date	Event Type	Magnitude
Eagle and Eagle Village	5/4/2009	Flood	Damage: $6.3M A flood of historic proportions began in **Eagle** along the Yukon River around 2 am on the morning of the 4th. In the week leading up to the flood, temperatures were unseasonably warm as a strong ridge of high pressure developed along the Alaska-Yukon border on April 27th and persisted until May 3rd. In fact, record high temperatures were either tied or broken on the 4 days preceding the flood. The record warmth caused side streams to fill the river channel before the ice on the river broke apart. When it finally broke, it created large chunks of ice, some the size of small houses that jammed together and created dams of water as the ice jam shifted and broke apart during the next two days. The ice was unusually thick in the Eagle area, and up to 7 feet in some locations along the river. ***By noon on the 4th, the old village of Eagle was flooded with water halfway up most houses, and some houses had water up to their roofs***. Parts of Eagle were flooded with water over Front Street. By the evening of the 4th, the water rose an additional 4 to 5 feet and pushed ice over the retaining wall into Front Street and buildings. ***By the afternoon on the 5th, homes in the old village of Eagle were completely destroyed by ice, and in other areas in Eagle the water and ice was to the second story of homes.*** A business that was constructed to be more than 10 feet above the previous high water mark of 1937 was less than one foot above the water. At around midnight, the water came up further and ice smashed all structures along Front Street, and some buildings were lifted off their foundations and either moved or floated down river and were destroyed. On the night of the 6th, the water levels dropped about 30 feet and the worst of the flooding was over. ***In total, 26 homes were destroyed, and there were 7 homes with major damage.*** There were no serious injuries or deaths reported as a result of the flooding, but by the time the flooding was over it caused ***the worst flooding on record to the community of Eagle.*** The damage estimates for this event include the costs to repair and replace homes that were damaged and destroyed as well as costs to repair and replace public infrastructure and equipment.

Table 5-6 Historic Flood Events (NWS)

Location	Date	Event Type	Magnitude
Central Portion	6/22/2006	Flood	Heavy rains over the Richardson Highway on the night of the 22nd and the 23rd created flood conditions on various rivers and streams. The heavy rains resulted from a number of thunderstorms forming over time and moving south over the same region of this zone. Rainfall amounts ranged from 2.73 inches at Delta Junction to around 5.0 inches at Trimms Camp (Alaska Department of Transportation Maintenance Station) Zone 222 - Water form the Tanana River flowed into Piledriver Slough in Salcha but the slough did not flood. Zone 223 and 224 - Flooding of the Salcha River occurred with the gage at the Richardson Highway bridge reaching 1.01 ft above the flood stage of 14.0 feet. Impacts on cabins along the Salcha River are unknown. Zone 226 - Ruby Creek flooded and washed out the Richardson Highway at mile 234.7. The road was closed to traffic for approximately 24 hours. Monetary amount of damage unknown.
Upper Tanana Valley Fortymile (Zone)	7/24/2001	Flood	Damage $90K Flood: Rainfall of 2.00 to 5.25 inches over the Upper Tanana Valley and Fortymile Area from July 23-25 resulted in flooding stages on the Tanana River and streams of the Fortymile Country. At the village of Northway, flooding began at approximately 11pm AST July 28. At the village of Tanacross, flooding began at approximately 3pm AST July 30. The first report of flood damage to the Taylor Highway was received at 8am AST July 24; at one point there were 4 mudslides and at least one washout reported. The Taylor Highway, the only land link to the **Village of Eagle, was cut by mudslides and washouts in several locations.** Extensive work by the State of Alaska Department of Transportation was required to reopen the highway.
Upper Tanana Valley Fortymile (Zone)	8/1/2001	Flood	Flood: The Taylor Highway, the only land link to the **Village of Eagle**, was cut by mudslides and washouts in several locations. Extensive work by the State of Alaska Department of Transportation was required to reopen the highway.
Eagle	June 12, 1964		Flood: An open water flood reached an elevation of 33.85 ft, with 60 percent damages.
Eagle	1962	Ice Jam Flood	Flood: Eagle: To an elevation of 35.94 ft, with 70 percent of the town damaged. Eagle Village: Flood water remained within the river bank.
Eagle Village	1946	Flood	Flood: Water height was almost up to the old church, but

Table 5-6 Historic Flood Events (NWS)

Location	Date	Event Type	Magnitude
			remained within the river bank.
Eagle	1937	Flood	Flood: Reported to have caused water depths of up to 5 ft.

(USACE 2011, NWS 2013, DHS&EM 2013)

5.3.3.3 Location, Extent, Impact, and Future Events Probability

Location

The Planning Team indicated that Eagle has major flooding impacts; most of which occur from snowmelt run-off and ice jams flooding. Water and ice blocks (in excess of 7' high) assail the community, eroding the embankment and many times overtopping the protective sheet pile and colliding with and flooding adjacent buildings causing massive water and ice destruction.

Figure 5-6, 5-7, and 5-8 depict the Alaska Pacific River Forecast Center's (APRFC) 2009 Ice Jam Flood impacts to City infrastructure.

Figure 5-6 City of Eagle Yukon Flood Impact (APRFC 2009)

Figure 5-7 City of Eagle Yukon Flood Impact (APRFC 2009)

Figure 5-8 City of Eagle Yukon Flood River Ice Block (APRFC 2009)

The USACE Floodplain Manager's 2011 report for the Native Village of Eagle describes the Village's relocation to higher ground:

> *"The village was relocated in the late 1990's. The new Eagle Village is located approximately seven miles upstream from the old village site. The estimated flood of record at the new site is 875.5 feet, based on water rise at Eagle. The elevation of the new site is approximately 890 feet" (USACE 2011).*

However, this location did not provide sufficient protection from unpredictable ice jam flooding and destruction because the May 2009 event totally obliterated the small village and residential buildings and infrastructure.

Extent

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

The following factors contribute to riverine flooding frequency and severity:

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

The City experience severe riverine flooding. Based on past flood history and the criteria identified in Table 5-2, the extent of flooding in the City and the Village is considered "Catastrophic" where critical facilities could be shut-down for 30 days or more with more than 50 percent of property being severely damaged.

Impact

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

- Structure flood inundation, causing water damage to structural elements and contents
- Erosion or scouring of stream banks, roadway embankments, foundations, footings for bridge piers, and other features

- Damage to structures, roads, bridges, culverts, and other features from high-velocity flow and debris carried by floodwaters. Such debris may also accumulate on bridge piers and in culverts, increasing loads on these features or causing overtopping or backwater damages
- Sewage and hazardous or toxic materials release as wastewater treatment plants or sewage lagoons are inundated, storage tanks are damaged, and pipelines are severed

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

Impacts and problems also related to flooding are deposition and stream bank erosion (erosion is discussed in detail in Section 5.3.2). 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 historical boat and barge landing areas. Deposition also reduces channel capacity, resulting in increased flooding or bank erosion. Stream bank erosion involves the removal of material from the stream bank. When bank erosion is excessive, it becomes a concern because it results in loss of streamside vegetation, loss of fish habitat, and loss of land and property (BKP 1988).

Probability of Future Events

Based on previous occurrences, USACE Floodplain Manager's report, and criteria in Table 5-3, it is "Highly Likely" a flood event will occur within the next year as there is a 1 in 1 year (1/1=100 percent) chance of occurring. History of events is greater than 33 percent likely per year.

5.3.4 Ground Failure

5.3.4.1 Nature

Ground failure describes avalanches, landslide, subsidence, unstable soils and other gravitational soil movement. Soil movement influences can include rain, snow, and/or water saturation induced avalanches or landslides; as well as be influenced by seismic activity, melting permafrost, river or coastal embankment undercutting, or a combination of steep slope conditions.

Landslides are a dislodgment and fall of a mass of soil or rocks along a sloped surface, or for the dislodged mass itself. The term is used for varying phenomena, including mudflows, mudslides, debris flows, rock falls, rockslides, debris avalanches, debris slides, and slump-earth flows. The susceptibility of hillside and mountainous areas to landslides depends on variations in geology, topography, vegetation, and weather. Landslides may also be triggered or exacerbated by indiscriminate development of sloping ground, or the creation of cut-and-fill slopes in areas of unstable or inadequately stable geologic conditions.

Additionally, landslides often occur with other natural hazards, thereby exacerbating conditions, such as:

- Earthquake ground movement can trigger events ranging from rock falls and topples to massive slides
- Intense or prolonged precipitation that causes flooding can also saturate slopes and cause failures leading to landslides
- Wildfires can remove vegetation from hillsides significantly increasing runoff and landslide potential

Development, construction, and other human activities can also provoke ground failure events. Increased runoff, excavation in hillsides, shocks and vibrations from construction, non-engineered fill places excess load to the top of slopes, and changes in vegetation from fire, timber harvesting and land clearing have all led to landslide events. Broken underground water mains can also saturate soil and destabilize slopes, initiating slides. Something as simple as a blocked culvert can increase and alter water flow, thereby increasing the potential for a landslide event in an area with high natural risk. Weathering and decomposition of geologic material, and alterations in flow of surface or ground water can further increase the potential for landslides.

The USGS identifies six landslide types, distinguished by material type and movement mechanism including:

Slides, the more accurate and restrictive use of the term landslide, refers to a mass movement of material, originating from a discrete weakness area that slides from stable underlying material. A *rotational slide* occurs when there is movement along a concave surface; a *translational slide* originates from movement along a flat surface.

Debris Flows arise from saturated material that generally moves rapidly down a slope. A debris flow usually mobilizes from other types of landslide on a steep slope, then flows through confined channels, liquefying and gaining speed. Debris flows can travel at speeds of more than 35 miles per hour (mph) for several miles. Other types of flows include debris avalanches, mudflows, creeps, earth flows, debris flows, and lahars.

Lateral Spreads are a type of landslide generally occurs on gentle slope or flat terrain. Lateral spreads are characterized by liquefaction of fine-grained soils. The event is typically triggered by an earthquake or human-caused rapid ground motion.

Falls are the free-fall movement of rocks and boulders detached from steep slopes or cliffs.

Topples are rocks and boulders that rotate forward and may become falls.

Complex is any combination of landslide types.

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

Seasonal freezing can cause frost heaves and frost jacking. Frost heaves occur when ice forms in the ground and separates sediment pores, causing ground displacement. Frost jacking causes

unheated structures to move upwards. Permafrost is frozen ground in which a naturally occurring temperature below 32ºF has existed for two or more years. (DHS&EM 2010).

Indicators of a possible ground failure include:

- Springs, seeps, or wet ground that is not typically wet
- New cracks or bulges in the ground or pavement
- Soil subsiding from a foundation
- Secondary structures (decks, patios) tilting or moving away from main structures
- Broken water line or other underground utility
- Leaning structures that were previously straight
- Offset fence lines
- Sunken or dropped-down road beds
- Rapid increase in stream levels, sometimes with increased turbidity
- Rapid decrease in stream levels even though it is raining or has recently stopped and
- Sticking doors and windows, visible spaces indicating frames out of plumb

The State of Alaska 2010 State Hazard Mitigation Plan provides additional ground failure information defining mass movement types, topographic and geologic factors which influence ground failure which may pertain to the City and the Village.

5.3.4.2 History

There are few written records defining ground failure impacts. However, the DHS&EM Disaster Cost Index lists one historical ground failure event affecting the City:

> ***10-231 2010 July Interior Flooding declared by Governor Parnell on July 26, 2010.*** *Beginning on July 10, 2010 and continuing through at least July 13, 2010, heavy rainfall through the Upper Tanana and Yukon River Basins caused severe flooding along several creeks along the Taylor Highway, Nabesna Road and the Alaska Highway. The damages are located within the Alaska Gateway Rural Education Attendance Area (REAA 3) and the Copper River Rural Education Attendance Area (REAA 11). There are no official jurisdictions in the areas.*
>
> *Heavily damaged areas are primarily between MP 64 near Chicken MP 160 in Eagle.* ***Damages include: landslides, washouts, erosion and bridge abutment and culvert damage.*** *Minor damages are flood related on the Tok Cutoff at MP 123 and the Alaska Highway at MP 164.*

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

Location

There are various ground failure locations within the Eagle area. Sources include the Department of Transportation/Public Facilities (DOT/PF), Natural Resources Conservation Service (NRCS), USACE, and other agencies. Steep, nearly vertical terrain is the most common landslide or snow avalanche location type and permafrost is present throughout most of Northern Alaska. These locations are generally located throughout the community as either continuous or discontinuous permafrost locations.

Tom Osterkamp studied permafrost activity along the Alaska pipeline as it was being built in the 1970s. He referred to Eagle's permafrost as stable:

> *"Though most of the permafrost in Alaska has gotten warmer during the past quarter century, some have bucked the trend, and Osterkamp is not sure why. Since he drilled boreholes at the Yukon River Bridge and Livengood in the 1980s, permafrost there has gotten colder. Since 1994, permafrost at an Eagle, Alaska borehole has remained stable" (Rozell 2008).*

The National Climate Data Center (NDCD) provides historical weather event data the Eagle area's ground failure incidents from creeping and sliding soil, mud flows, or melting permafrost. These events impact community access roads (Taylor Highway), as well as city and village streets and roads. Many of these periodic ground failure events were a secondary result of soil saturation either from rainfall or snowmelt as indicated. (Table 5-7).

Table 5-7 Weather Induced Ground Failure Events

Location	Date	Event Type	Magnitude
Upr Tanana Vly Fortymile (Zone)	8/1/2001	Mudslides, Washouts	Ground Failure: The Taylor Highway, the only land link to the **village of Eagle**, was cut by mudslides and washouts in several locations. Extensive work by the State of Alaska Department of Transportation was required to reopen the highway.
Upr Tanana Vly Fortymile (Zone)	7/24/2001	Heavy Rain, Flood, Mudslides, Washouts	Damage $90K Ground Failure: Rainfall of 2.00 to 5.25 inches over the Upper Tanana Valley and Fortymile Area from July 23-25 resulted in flooding stages on the Tanana River and streams of the Fortymile Country. At the village of Northway, flooding began at approximately 11pm AST July 28. At the village of Tanacross, flooding began at approximately 3pm AST July 30. The first report of flood damage to the Taylor Highway was received at 8am AST July 24; at one point there were 4 mudslides and at least one washout reported. The Taylor Highway, the only land link to the **village of Eagle**, was cut by mudslides and washouts in several locations. Extensive work by the State of Alaska Department of Transportation was required to reopen the highway.

(NCDC 2013)

According to the permafrost and ice conditions map (Figure 5-9) developed for the National Snow and Ice Data Center/World Data Center for Glaciology located in the State Hazard Mitigation Plan (SHMP) (DHS&EM 2010), discontinuous permafrost is present in the Eagle and Eagle Village area.

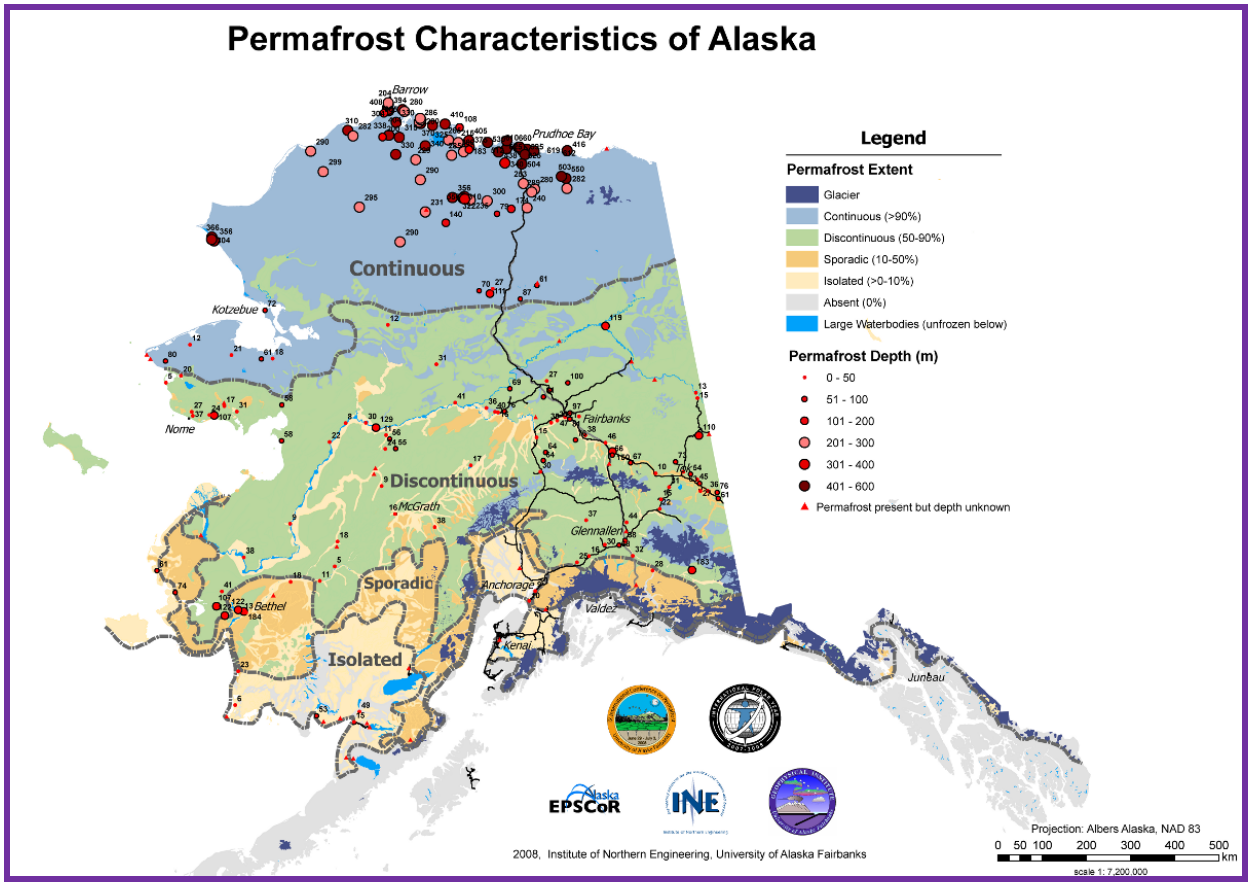

Figure 5-9 Permafrost and Ground Ice Map of Alaska (Jorgenson et al 2008)

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 research and the Planning Team's knowledge of past ground failure and various degradation events and the criteria identified in Table 5-2, the extent of ground failure impacts in the City are considered limited. Permafrost impacts would not occur quickly but over time with warning signs. However, mudslides and land subsidence could occur quickly and are usually triggered from rain or snowmelt saturated soils. The damage extent from this hazard is considered "Limited." Injuries would not likely result in permanent disability or death, neither would it shutdown critical facilities and services for more than one week. However, 10 percent of property could be severely damaged.

Impact

Impacts associated with ground failure include surface subsidence, infrastructure, building, and/or road damage. Ground failure events (such as melting permafrost) do not typically pose a sudden and catastrophic hazard; however mudslides or flows and landslides may. Typical structural damages from ground failure events occur from improperly designed and constructed buildings that settle as the ground subsides, resulting in structure loss or expensive repairs. It may also impact buildings, communities, pipelines, airfields, as well as road and bridges. Careful planning and location and facility construction design is warranted to avoid costly damage to these facilities.

The Planning Team stated "the City and Village annually deal with their permafrost issues as they impact structures by re-leveling the structures as needed."

Probability of Future Events

Even though there are few written records defining ground failure impacts for the City, the Planning Team has stated the City of Eagle and Native Villages experience annually recurring ground failure damages impact to structures, roads, buildings, and the airport. The Planning Team stated the probability for ground failure follows the criteria in Table 5-3, the future damage probability resulting from ground failure is "Likely" in the next three years, event has up to 1 in 3 years (1/3=33%) chance of occurring as the history of events is greater than 20 percent but less than 33 percent likely per year.

5.3.5 Severe Weather

5.3.5.1 Nature

Severe weather occur throughout Alaska with extremes experienced by the City of Eagle and the Native Village of Eagle that includes thunderstorms, lightning, hail, heavy and drifting snow, freezing rain/ice storm, extreme cold, and high winds.

Heavy Rain occurs rather frequently over the coastal areas along the Bering Sea and the Gulf of Alaska. Heavy rain is a severe threat to the entire Eagle area**.**

Heavy Snow generally means snowfall accumulating to four inches or more in depth in 12 hours or less or six inches or more in depth in 24 hours or less.

Drifting Snow is the uneven distribution of snowfall and snow depth caused by strong surface winds. Drifting snow may occur during or after a snowfall.

Freezing Rain 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 is the definition of extreme cold varies according to the normal climate of a region. In areas unaccustomed to winter weather, near freezing temperatures are considered "extreme". In Alaska, extreme cold usually involves temperatures between -20 to -58°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.

High Winds occur in Alaska when there are winter low-pressure systems in the North Pacific Ocean and the Gulf of Alaska. Alaska's high wind can equal hurricane force but fall under a different classification because they are not cyclonic nor possess other hurricane characteristics. In Alaska, high winds (winds in excess of 60 mph) occur rather frequently and pose a severe threat to the Eagle area.

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.

Winter Storms include a variety of phenomena described above and as previously stated may include several components; wind, snow, and ice storms. Ice storms, which include freezing rain, sleet, and hail, can be the most devastating of winter weather phenomena and are often the cause of automobile accidents, power outages, and personal injury. Ice storms result in the accumulation of ice from freezing rain, which coats every surface it falls on with a glaze of ice. Freezing rain is most commonly found in a narrow band on the cold side of a warm front, where surface temperatures are at or just below freezing temperatures. Typically, ice crystals high in the atmosphere grow by collecting water vapor molecules, which are sometimes supplied by evaporating cloud droplets. As the crystals fall, they encounter a layer of warm air where they particles melt and collapse into raindrops. As the raindrops approach the ground, they encounter a layer of cold air and cool to temperatures below freezing. However, since the cold layer is so shallow, the drops themselves do not freeze, but rather, are supercooled, that is, in liquid state at below-freezing temperature. These supercooled raindrops freeze on contact when they strike the ground or other cold surfaces.

Snowstorms happen when a mass of very cold air moves away from the polar region. As the mass collides with a warm air mass, the warm air rises quickly and the cold air cuts underneath it. This causes a huge cloud bank to form and as the ice crystals within the cloud collide, snow is formed. Snow will only fall from the cloud if the temperature of the air between the bottom of the cloud and the ground is below 40 degrees Fahrenheit. A higher temperature will cause the snowflakes to melt as they fall through the air, turning them into rain or sleet. Similar to ice storms, the effects from a snowstorm can disturb a community for weeks or even months. The combination of heavy snowfall, high winds and cold temperatures pose potential danger by causing prolonged power outages, automobile accidents and transportation delays, creating dangerous walkways, and through direct damage to buildings, pipes, livestock, crops and other vegetation. Buildings and trees can also collapse under the weight of heavy snow.

Winter storm floods are discussed in Section 5.3.3.

Figure 5-8 displays Alaska's annual rainfall map based on Parameter-elevation Regressions on Independent Slopes Model (PRISM) that combines climate data from NOAA and the US Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) climate stations with a digital elevation model to generate annual, monthly, and event-based climatic element estimates such as precipitation and temperature.

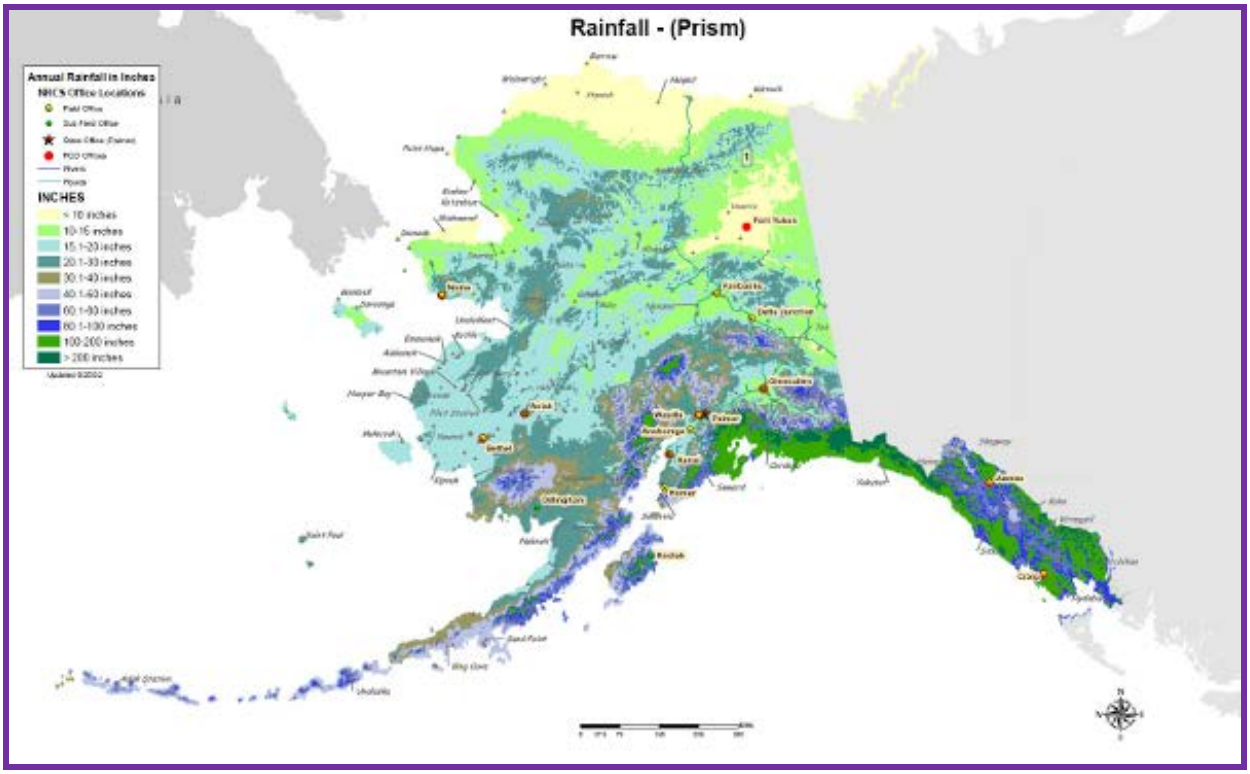

Figure 5-8 Statewide Rainfall Map (USDA 2013)

5.3.5.2 History

The Eagle and Eagle Village area is continually impacted by severe weather events. Hurricane force wind, winter storms and blizzards, heavy snow, and cold typically have severe results.

The Western Regional Climate Center (WRCC) provides weather data throughout the Pacific Northwest. The WRCC's daily comparative average temperature, precipitation, and snow depth data are portrayed in Figure 5-8 for the Eagle area.

EAGLE, ALASKA (502607)

Period of Record Monthly Climate Summary

Period of Record : 9/ 1/1949 to 9/30/2012

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	-3.9	5.6	21.8	42.3	59.2	71.0	72.9	66.9	53.9	32.3	11.4	1.4	36.2
Average Min. Temperature (F)	-21.5	-16.6	-8.2	14.4	31.9	43.9	47.1	41.1	30.7	15.1	-5.0	-15.6	13.1
Average Total Precipitation (in.)	0.53	0.43	0.34	0.31	0.96	1.67	2.29	1.96	1.22	0.94	0.69	0.70	12.04
Average Total SnowFall (in.)	7.8	6.9	5.1	3.1	0.9	0.0	0.0	0.0	0.8	9.4	10.9	11.3	56.2
Average Snow Depth (in.)	17	20	20	13	0	0	0	0	0	2	8	13	8

Percent of possible observations for period of record.
Max. Temp.: 88.1% Min. Temp.: 88.1% Precipitation: 88.2% Snowfall: 76.3% Snow Depth: 77.3%
Check Station Metadata or Metadata graphics for more detail about data completeness.

Western Regional Climate Center, wrcc@dri.edu

Figure 5-10 Eagle Area Temperature Extremes (WRCC 2012)

Figure 5-11 and 5-12 display the University of Alaska Fairbanks, Scenarios Network for Alaska and Arctic Planning (SNAP) historic and future potential temperature and precipitation charts.

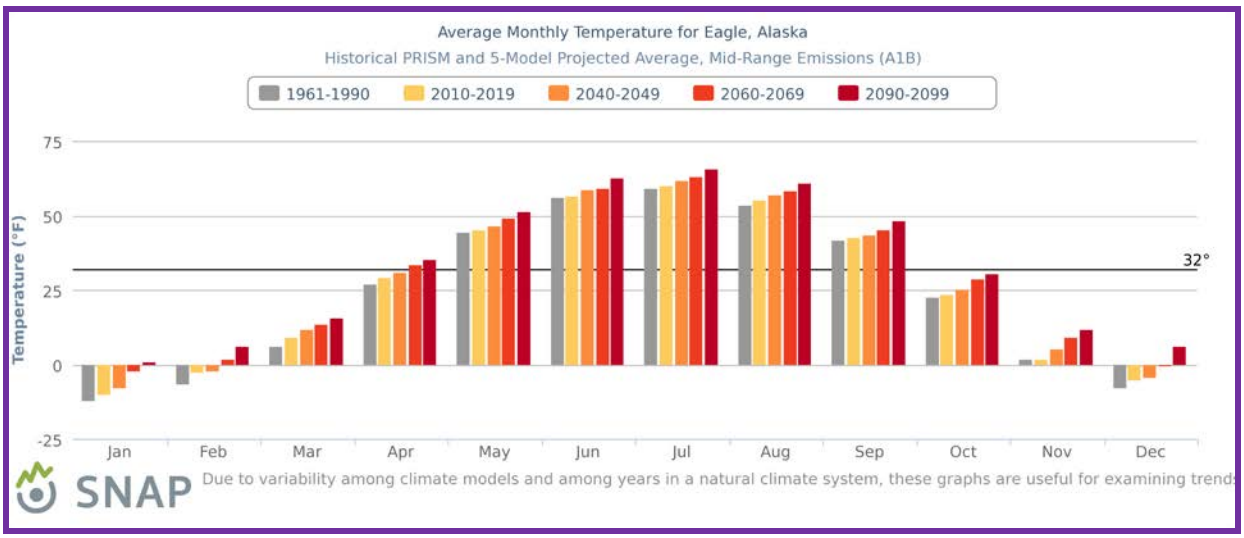

Figure 5-11 Eagle Area Historic and Predicted Temperature (SNAP 2013)

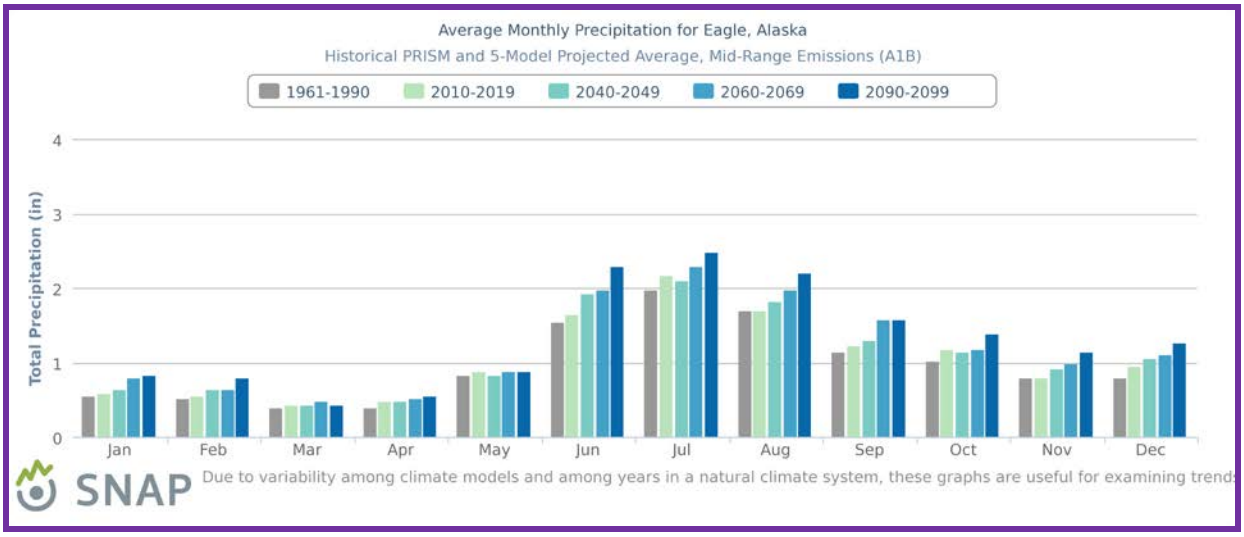

Figure 5-12 Eagle's Historic and Predicted Precipitation (SNAP 2013)

The entire Eagle area is continually impacted by severe weather as depicted in Table 5-8 which provides a representative sample of major storm events the National Weather Service identified for the Eagle area (Upper Tanana/Forty Mile and the Yukon Flats Weather Zones).

Each weather event may not have specifically impacted the area around Eagle. These storm events are listed due to their close proximity to both Eagle and Eagle Village or by location within the identified zone.

Table 5-8 Severe Weather Events

Location	Date	Event Type	Magnitude
Eagle	September 2013	Heavy Snow	Record snowfall for the City since 1992
Upper Tanana Valley Fortymile (Zone) And Deltana And Tanana (Zone)	1/24/2013	Heavy Snow	Heavy Snow: Over one foot of snow fell along the Richardson Highway from the 24th through the 25th. At **Eagle** in zone 224, near the Canada border, the Cooperative Observer reported 10 inches of snow.
Upper Tanana Valley Fortymile (Zone)	9/5/2012	High Wind	High Wind: 65 mph (56 Kts) strong chinook flow over the Alaska Range produced high winds in and near the Alaska Range. Zone 224: It was estimated that the wind gusted as high as 56 kt (65 mph) at the Robertson River Bridge at 1100AKST on the 5th. Some trees were knocked over by the high wind.
Upper Tanana Valley Fortymile (Zone)	12/22/2011	Heavy Snow	Heavy Snow: Heavy snowfall at the Robertson River Bridge with a total of 10.2 inches of snow. The heaviest snow fell during the afternoon and early evening of the 22nd during which there was 5.7 inches of snow observed in 7 hours.
Upper Tanana	12/4/2011	Winter	Winter Storm: heavy snow and blizzard conditions along much of the west

Table 5-8 Severe Weather Events

Location	Date	Event Type	Magnitude
Valley Fortymile (Zone)		Storm	coast and arctic coast. A strong Chinook produced high winds, freezing rain and snow in parts of the interior. Zone 224: Freezing rain was observed along the Alaska Highway from the Robertson River Bridge to Northway. The highway was reported to be an ice skating rink, and it is likely that there was up to one half of an inch of ice in spots. The freezing rain changed to snow with accumulations of up to 6 inches. There was a report of 5 inches of snow in a two hour period at Tanacross.
Upper Tanana Valley Fortymile (Zone)	6/22/2011	Heavy Rain	Heavy rainfall in excess of an inch on the 22nd into the 23rd caused the Taylor Highway to be closed in two spots. The first road closure lasted approximately 11 hours and occurred in the Jack Wade area between mile posts 83 and 86, and was caused by a washout. The road closure blocked access to the Canada border via the Top of the World Highway, which connects with the Taylor highway. The second road closure, occurred between mile posts 114 and 116 as mudslides blocked the road.
Upper Tanana Valley Fortymile (Zone)	11/23/2010	Ice Storm	Heavy Snow: An extremely warm and moist air mass moving around a large ridge of high pressure in the north Pacific produced a prolonged period of freezing rain across much of interior Alaska on November 22-24, 2010. Zone 224: Freezing rain fell on the night of the 23rd through early morning on the 24th. One-tenth of an inch of rain was reported by a Co-op observer and also by a Storm Spotter.
Upper Tanana Valley Fortymile (Zone)	10/28/2009	Heavy Snow	Heavy Snow: Snow developed south of the Robertson River Bridge off the Alaska Highway (zone 224). A total of 13.2 inches of snow had fallen by 4 pm on the 29th, with a storm total of 20 inches. Based on the observations from the NWS Storm Spotter south of the Robertson River Bridge, about 12 miles west of Tanacross, it is very likely that similar or greater amounts of snow fell along parts of the north facing slopes in the Eastern Alaska Range. A cooperative observer at Dry Creek reported a storm total of 11.3 inches from this event.
Eagle	5/4/2009	Flood	Damage: $6.3M A flood of historic proportions began in **Eagle** along the Yukon River around 2 am on the morning of the 4th. In the week leading up to the flood, temperatures were unseasonably warm as a strong ridge of high pressure developed along the Alaska-Yukon border on April 27th and persisted until May 3rd. In fact, record high temperatures were either tied or broken on the 4 days preceding the flood. There were no serious injuries or deaths reported as a result of the flooding, but by the time the flooding was over it caused the worst flooding on record to the community of Eagle. The damage estimates for this event include the costs to repair and replace homes that were damaged and destroyed as well as costs to repair and replace public

Table 5-8 Severe Weather Events

Location	Date	Event Type	Magnitude
			infrastructure and equipment.
Upper Tanana Valley Fortymile (Zone)	1/1/2009	Extreme Cold/Wind Chill	Extreme Cold, Wind Chill: The significant cold snap that developed across interior Alaska on December 27th continued through January 12th. Although the cold snap did not produce any record low temperatures, it was the most prolonged cold snap across interior Alaska since 1999. Zone 224:|Chicken: -68°F, on the 8th. O'Brien Creek:-65°F, on the 8th. Northway: -61°F, on the 8th.Tok: -60°F, on the 8th and 9th. **Eagle: -58°F**, on the 8th. The cold snap ended with a strong Chinook on January 15th through the 17th, and established many all-time record warm temperatures for the month of January across interior Alaska.
Yukon Flats Nearby Uplands (Zone) And Deltana And Tanana (Zone)	12/27/2008	Extreme Cold/Wind Chill	Extreme Cold, Wind Chill: A significant cold snap developed across interior Alaska on December 27th and continued into January. Zone 224: O'Brien Creek: -57°F, Tok: -52°F, Chicken: -52°F, **Eagle:.-** 50°F, Northway: -49°F
Upper Tanana Valley Fortymile (Zone)	2/9/2008	Winter Weather	Winter Weather: High pressure across the Arctic Ocean and low pressure in the Gulf of Alaska combined to produce locally strong east to northeast winds across portions of interior Alaska. Winds of 15 to 30 mph produced areas of blowing snow, and with temperatures between -20 and -30°F the wind chills were as low as -55°F. The 25th running of the Yukon Quest was delayed on its second day because the Steese Highway was closed by high winds and drifting snow at about mile 81.
Upper Tanana Valley Fortymile (Zone)	3/17/2005	Heavy Snow	Heavy Snow: **Eagle** Co-operative Observer reported 6.0 inches of snow.
Yukon Flats Nearby Uplands (Zone)	1/6/2005	Blizzard	Blizzard, Snow, Wind: A warm front, locally heavy snowfall over parts of the interior, as well as likley blizzard conditions over the summits of the Steese Highway, where the Alaska Department of Transportation closed the highway at Eagle Summit and Twelvemile Summit. Zone 224: Heavy Snow, **Eagle 7.0 inches** in the 24 hours.
Upper Tanana Valley Fortymile (Zone)	1/6/2005	Heavy Snow	Heavy Snow: Locally heavy snowfall over parts of the interior, as well as likley blizzard conditions over the summits of the Steese Highway, where the Alaska Department of Transportation closed the highway at Eagle Summit and Twelvemile Summit. Heavy Snow was reported at: Zone 224: **Eagle**: 7.0 inches in the 24 hours beginning 0800 AST the 6th.
Upper Tanana Valley Fortymile (Zone)	6/13/2004	Wildfire	Wildfire: Wildfires began over the eastern Interior of Alaska around June 13 and continued through the summer, setting a record year for acres burned since records began in 1950. By the end

Table 5-8 Severe Weather Events

Location	Date	Event Type	Magnitude
			of June, 1.15 million acres had burned. Through the entire summer, nearly 6.5 million acres burned across northern Alaska. Villages/Settlements Threatened from these fires: **Zone 224: Eagle/Eagle Village**. June 23: The Taylor Highway from **Tok to Eagle** and Dawson was closed.
Upper Tanana Valley Fortymile (Zone)	11/26/2002	Ice Storm	Ice Storm: High winds near the Alaska Range, brief freezing rain and then rain to the Middle Tanana Valley and Yukon Flats. High Winds were reported with peak gusts to 50 mph. In zone 224 at Northway, 0.11 of an inch of Freezing Rain occurred the evening of the 26th. **Eagle** received 0.62 inches of rain, as temperatures remained above freezing.
Upper Tanana Valley Fortymile (Zone)	10/15/2002	Heavy Snow	Heavy Snow: A warm front moving slowly north over eastern Alaska produced up to eight inches of snow as reported by the Co-operative observer at **Eagle**.
Upper Tanana Valley Fortymile (Zone)	5/1/2002	Heavy Snow	Heavy Snow: Heavy snow occurred at **Eagle Alaska,** where eleven inches of new snow was reported by the Co-op observer there.
Upper Tanana Valley Fortymile (Zone)	8/1/2001	Flood	Flood: The Taylor Highway, the only land link to the **Village of Eagle**, was cut by mudslides and washouts in several locations. Extensive work by the State of Alaska Department of Transportation was required to reopen the highway.

(NCDC 2012)

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

Location

The entire area, which includes the City and Village of Eagle, experiences periodic severe weather impacts. The most common to the area are high winds and severe winter storms. Table 5-8 depicts weather events that have impacted the area since 2001 and are provided as a representative sample.

Extent

The entire City is equally vulnerable to the severe weather effects. The City experiences severe storm conditions with moderate snow depths; wind speeds exceeding 90 mph; and extreme low temperatures that reach -58ºF.

Based on past severe weather events and the criteria identified in Table 5-2, 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 could be severely damaged.

Impact

The intensity, location, and the land's topography influence severe weather event impacts within a community. Hurricane force winds, rain, and snow can be expected to impact the entire Eagle area.

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

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

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

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

Probability of Future Events

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

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

Fuel is 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 is the most variable factor affecting wildland fire behavior is weather. Temperature, humidity, wind, and lightning can affect chances for ignition and spread of fire. Extreme weather, such as high temperatures and low humidity, can lead to extreme wildland fire activity. By contrast, cooling and higher humidity often signal reduced wildland fire occurrence and easier containment.

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

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

5.3.6.2 History

The Alaska Interagency Coordination Center (AICC) identified 151 wildland fires (Figure 5-11) that occurred within 50 miles of the City and the Native Village. Table 5-9 lists 85 of those fires that exceeded 100 acres with the largest one burning 525,000 acres in 1969, and another burning 116,371, acres in 2005.

Table 5-9 Wildfire Locations Since 1939 within 50 Miles of Eagle

Fire Name	Fire Year	Estimated Acres	Latitude	Longitude	Cause
Tindir Creek	2012	173	65.4	-141.2166667	Lightning
Marie Creek	2012	9,668	65.175	-142.6516666	Lightning
Ettrain Creek	2012	296	65.4425	-141.0369444	Lightning
Waterfall	2010	1,252	65.3233337	-141.3169403	Lightning
Witch Mountain	2010	1,459	65.3416672	-141.9711151	Lightning
Yukon Slough	2010	2,666	65.2811127	-141.9205627	Lightning
Judge Creek	2010	1,450	65.5272217	-142.2913818	Lightning
Mardow Creek	2009	8,754	65.5666656	-142.6666718	Lightning
Nation	2009	272	65.2597198	-141.8516693	Lightning
Glenn Creek	2008	622	65.3230591	-142.1363831	Lightning
Tindir Creek	2008	426	65.3819427	-141.2486115	Lightning
Charley River	2007	3,280	65.316391	-142.6125031	Lightning
Nation River	2007	1,658	65.3211136	-141.5724945	Lightning
Tinder Creek	2007	512	65.398056	-141.2299957	Lightning
Biederman Bluff	2007	172	65.4116669	-142.5294495	Lightning
Trout Creek	2005	5,069	65.11833	-141.6844	Lightning
Boundary Creek	2005	116,371	64.65639	-141.0222	Lightning
Smith Creek	2005	16,976	64.18333	-141	Lightning
Mission Creek	2005	33,655	64.78917	-141.5342	Lightning
Lucky Creek	2004	48,231	64.3	-141.7167	Lightning
American Summit	2004	11,728	64.56667	-141.345	Lightning
Bullion Creek	2004	15,563	64.41666	-142.4667	Lightning
King Creek	2004	40,599	64.4	-141.3833	Lightning
Champion Creek	2004	15,591	64.54	-141.7	Lightning
Deer Creek	2004	103,092	64.89833	-141.9817	Lightning
Dawson 31	2004	7,414	64.805	-141.0061	Lightning
Nation River	2004	66,832	65.19334	-141.5217	Lightning
Mardow Creek	2003	337	65.57139	-142.5614	Lightning
Hard Luck Creek	2000	436	65.28333	-141.6167	Lightning
N. Fork 40 Mile River	1999	645	64.33334	-142.0167	Lightning
Witch	1999	46,956	65.28333	-141.9333	Lightning
Kink	1999	92,010	64.36667	-142.0667	Lightning
Jessica	1999	48,759	65.15	-141.2	Lightning
Forty Mile	1998	420	64.25	-141.1167	Lightning
Hard Luck Creek	1996	2,230	65.1166687	-141.0833282	Lightning
532274	1995	300	64.5333328	-141.8999939	Lightning
Eaa Sw 20	1994	2,400	64.4666672	-141.5333405	Lightning
Eaa Sw 37	1994	1,140	64.4333344	-142.4166718	Lightning
Mt.Sheba	1994	500	64.3166656	-143.1333313	Lightning
Eaa N 31	1994	300	65.2833328	-141.2166595	Lightning
Eaa Sw 42	1994	1,000	64.1500015	-141.6499939	Lightning
Eaa Nw 50	1993	2,250	65.5	-141.7666626	Lightning
331585	1993	5,530	64.1999969	-141.0833282	Lightning
Eaanw36	1993	479	65.3166656	-141.9499969	Lightning
132416	1991	100	64.4000015	-141.2333374	Lightning

Table 5-9 Wildfire Locations Since 1939 within 50 Miles of Eagle

Fire Name	Fire Year	Estimated Acres	Latitude	Longitude	Cause
Eaa E 10	1991	205	64.9000015	-140.8833313	Lightning
Eaa N 20	1991	140	65.0666656	-140.8833313	Lightning
Eaa Nw 20	1990	105	65.0833359	-141.7333374	Lightning
932011	1989	240	64.9666672	-141.2333374	Lightning
832014	1988	400	64.6666641	-140.9833374	Lightning
Fbk E 155	1987	3,660	64.3000031	-141.9333344	Lightning
Cabin	1971	10,000	65.25	-141.6666718	Lightning
Kan	1971	20,000	65.5	-141.7833405	Lightning
Butte Creek	1969	525,000	65.3333359	-142.1999969	Recreation
Calico Bluff	1969	28,800	64.9333344	-141.1000061	Lightning
King Creek	1969	3,650	64.4000015	-141.4166718	Recreation
Montauk Bluff	1969	46,080	65.1333313	-141.4499969	Lightning
Nation	1968	1,200	65.3000031	-141.8166656	Recreation
Funnel Creek	1967	9,410	65.0333328	-141.0333405	Lightning
Ridgeway	1967	7,200	64.9666672	-140.7166595	Lightning
Butte Creek	1967	2,460	65.2166672	-142.1666718	Lightning
Miller`S Camp	1967	2,300	64.9666672	-141.4499969	Lightning
Nation River	1967	10,000	65.2833328	-141.4833374	Lightning
Nation Ne-16	1959	2,240	65.3166656	-142.3000031	Lightning
70 Mile River	1959	100	64.9166641	-142.4166718	Lightning
Hardluck Creek	1958	800	65.0833359	-142.4166718	Lightning
Kandik	1958	15,000	65.4499969	-141.7333374	Lightning
Hutchinson Creek	1957	320	64.4166641	-142	Lightning
Boundary Creek	1957	2,600	64.6666641	-141.0333405	Lightning
Nation River	1957	5,600	65.2833328	-141.4499969	Lightning
Hardluck Creek	1957	800	65.0833359	-142.4166718	Lightning
Upper Nation River	1957	300	65.2166672	-141.1000061	Lightning
Eagle Summit E-5	1957	700	64.6333313	-141.2166595	Lightning
Smith Creek Fire	1953	300	64.2833328	-141.0500031	Smoking
Nation River #2	1950	1,900	65.3833313	-141.4166718	Lightning
Nation River #1	1950	27,650	65.5	-142.5	Lightning
Columbia Creek	1950	3,100	64.4499969	-141.3333282	Smokers
Boundary 40 Mile #2	1950	1,216	64.5824966	-141	Lightning
Eagle #1	1950	8,350	64.8333359	-141.0833282	Lightning
Charley River N	1950	9,730	65.5	-142.5	Lightning
Charley River S. #2	1950	27,300	65.25	-142.8833313	Campfire
Jack Wade Fire	1950	747	64.1833344	-141.3999939	Smoking
70 Mile Falls	1947	1,200	64.9333344	-141.8666687	Prospector
Washington Creek	1946	7,000	64.9666672	-141.8333282	Lightning

(AICC 2012)

Figure 5-13 identifies the Eagle area fire's locations to depict their relative threat potential to the City and Village.

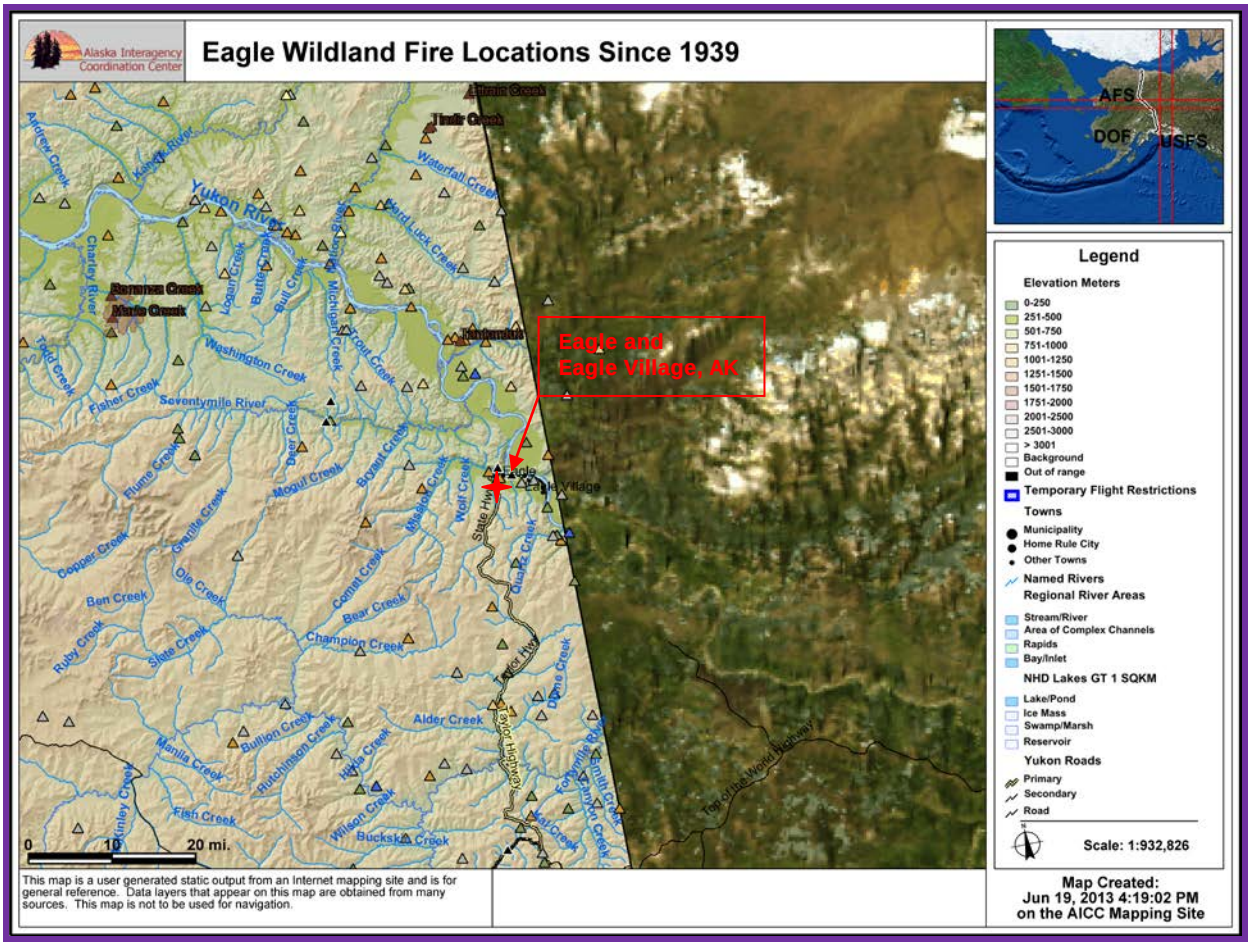

Figure 5-13 Eagle Alaska Area Historical Wildfires (AICC 2013)

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

Location

Under certain conditions wildland fires may occur near the City when weather, fuel availability, topography, and ignition sources combine. Since fuels data is not readily available, for the purposes of this plan, all areas outside City limits are considered to be vulnerable to wildland fire impacts. Since 1938, only four wildland fire events have occurred within 50 miles of the City (Figure 5-10).

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.

22 of the 151 (14.6%) historical fire events have burned in excess of 10,000 acres. The vast majority of the fires were caused by lightning. However, 25 fires (16.5%) were caused by human activity. It is difficult to determine the average number of acres burned as the fires were vastly different. An average based on such diverse data would easily be overstated.

Based on the large number of past wildland fire events and the criteria identified in Table 5-3, the magnitude and severity of impacts to the City of Eagle and the Native Village of Eagle could be considered “catastrophic with multiple deaths, potential for critical facilities to be shut down for 30 days or more, with more than 50 percent of property or critical infrastructure being severely damaged, and permanent damage to the economy.

Impact

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

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

Probability of Future Events

Fire is recognized as a critical feature of the natural history of many ecosystems. It is essential to maintain the biodiversity and long-term ecological health of the land. The role of wildland fire as an essential ecological process and natural change agent has been incorporated into the fire management planning process and the full range of fire management activities is exercised in Alaska, to help achieve ecosystem sustainability, including its interrelated ecological, economic, and social consequences on firefighters, public safety and welfare; natural and cultural resources threatened; and the other values to be protected dictate the appropriate management response to the fire. In Alaska, and within 50 miles of the City of Eagle, the natural fire regime is characterized by a return interval of approximately 150 years due to their vegetation type and gently rolling topography.

Based on the history of wildland fires in the Eagle area and applying the criteria identified in Table 5-3, it is “Possible” that a wildland fire event could occur within in the next five years. The event has up to 1 in 5 years (1/5=20 %) chance of occurring and the history of events is greater than or equal to 10 percent but less than or equal to 20 percent likely each year.

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Section Six outlines the vulnerability process for determining potential losses for the community from various hazard impacts.

6.1 VULNERABILITY ANALYSIS OVERVIEW

A vulnerability analysis predicts the extent of exposure that may result from a hazard event of a given intensity in a given area. The analysis provides quantitative data that may be used to identify and prioritize potential mitigation measures by allowing communities to focus attention on areas with the greatest risk of damage. A vulnerability analysis is divided into eight steps:

1. Asset Inventory
2. Exposure Analysis For Current Assets
3. Repetitive Loss Properties
4. Land Use and Development Trends
5. Vulnerability Analysis Methodology
6. Data Limitations
7. Vulnerability Exposure Analysis
8. 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 area.
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.

Table 6-1 lists the City of Eagle's infrastructure hazard vulnerability.

Table 6-1 City of Eagle's Vulnerability Overview

Hazard	Area's Hazard Vulnerability			
	Percent of Jurisdiction's Geographic Area	Percent of Population	Percent of Building Stock	Percent of Critical Facilities and Utilities
Earthquake	100	100	100	100
Erosion	< 10	30	< 30	< 10
Flood	75	75	75	75
Ground Failure	100	100	100	100
Weather	100	100	100	100

Table 6-2 lists the Native Village of Eagle's infrastructure hazard vulnerability.

Table 6-1 Native Village of Eagle's Vulnerability Overview

Hazard	Area's Hazard Vulnerability			
	Percent of Jurisdiction's Geographic Area	Percent of Population	Percent of Building Stock	Percent of Critical Facilities and Utilities
Earthquake	100	100	100	100
Erosion	50	50	50	50
Flood	100	100	100	100
Ground Failure	100	100	100	100
Weather	100	100	100	100

6.2 LAND USE AND DEVELOPMENT TRENDS

6.2.1 Land Use

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.

6.3 EXPOSURE ANALYSIS FOR CURRENT ASSETS

6.3.1 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.

6.3.1.1 Population and Building Stock

The City of Eagle:

Population data for the City of Eagle were obtained from the 2010 U.S. Census and the DCRA. The US Census reports the City's total population for 2010 as 86 and 2012 DCRA data reported a population of 87 (Table 6-3).

Table 6-2 City of Eagle's Estimated Population and Building Inventory

Population		Residential Buildings	
2010 Census	DCCED 2012 Data	Total Building Count	Total Value of Buildings[1]
86	87	146	US Census: $9,490,000 City: $12,410,000

Sources: U.S. Census 2010, and 2012 DCRA population data.
[1] US Census listed housing value at $65,000
The Project Team determined that the average structural replacement value of all single-family residential buildings is $85,000 per structure due to rural construction expense adjustment.

The Native Village of Eagle:

Population data for the Native Village of Eagle were obtained from the 2010 U.S. Census and the DCRA. The US Census reports the City's total population for 2010 as 68 and 2012 DCRA data reported a population of 74 (Table 6-3).

Table 6-3 Village of Eagle's Estimated Population and Building Inventory

Population		Residential Buildings	
2010 Census	DCCED 2012 Data	Total Building Count	Total Value of Buildings[1]
67	74	49	US Census: $3,635,800 Village: $4,165,000

Sources: U.S. Census 2010, and 2012 DCRA population data.
[1] US Census listed housing value at $74,200
The Project Team determined that the average structural replacement value of all single-family residential buildings is $85,000 per structure due to rural construction expense adjustment.

Estimated replacement values for those structures, as shown in Table 6-2 and 6-3, were obtained from the 2010 U.S. Census, and 2012 DCCED/DCRA certified estimates.

The Planning Team stated that residential replacement values are generally understated because replacement costs exceed Census structure estimates due to material purchasing, barge or airplane delivery, and construction in rural Alaska. The Planning Team estimates an average 30ft by 40 ft (1,200 sq ft) residential structure costs $85,000. A total of 49 single-family residential buildings were considered in this analysis.

6.3.1.2 Existing Infrastructure

DCRA describes the City's existing infrastructure as including:

> *"**Municipal Facilities & Utilities**:*
>
> - *Watering Point, Volunteer Fire/EMS/Ambulance, Roads, Recreation*
>
> ***Transportation:***
>
> - *Eagle has access to the state road system and Canada only during summer months via the Taylor and Top of the World Highways.*
> - *A state-owned 3,600' long by 75' wide gravel airstrip is available; flights originate from Fairbanks and Tok.*
> - *Float planes land on the Yukon River.*
> - *There is no dock, but a public boat landing is available. During the summer, the Holland America Tour Boat is available between Dawson City and Eagle on the Yukon River.*
>
> *(DCRA 2013)*

City of Eagle's Completed Projects

Table 6-4 lists the City of Eagle's identified "completed" infrastructure improvement projects. They provide a depiction of the community's ongoing development trends and focus toward improving aging infrastructure.

Table 6-4 Completed Projects – City of Eagle

Lead Agency	Fiscal Year	Status	Project Description/Comments	Project Stage	Total Cost
Department of Transportation (DOT)/Public Facilities (PF)	2010	Funded	Purchase Insurance Coverage, American Recovery and Reinvestment Act (ARRA)	Closed	$3,877
Division of Community and Regional Affairs (DCRA)	2003	Funded	State Revenue Sharing (SRS)	Closed	$158
DCRA	2007	Funded	School Water System Upgrade - Legislative Grant	Completed	$25,000
DCRA	2007	Funded	Education Books and Materials - Legislative Grant	Completed	$10,000
Alaska Native Tribal Health Consortium (ANTHC)	2006	Funded	Design and construction planning for a new clinic in Eagle, Alaska.	Preliminary	$226,566
Denali Commission (Denali)	2006	Funded	Design Management	Project Close-out Complete	$226,566
Denali	2006	Funded	Eagle, Eagle Village, Dust Control Design & Construction. The project consists of design and construction of improvements of up to 2.0 miles of the Taylor Highway in the city, approximately 0.5 miles of the Taylor Highway in the old village and approximately 0.5 miles of the Taylor Highway in the new village.	Construction	
Federal Aviation Administration (FAA)	2006	Funded	Rehabilitate Runway - OTHER FUNDING: DOT/PF	Contract	$19,930
DCRA	2003	Funded	Customs House Renovation & Fire Hall Addition - Capital Matching	Completed	$26,316
DCRA	2003	Funded	Renovation of Old School - Capital Matching	Completed	$15,790
Department of Transportation (DOT)/ Public Facilities (PF)	2003	Funded	Restore Customs House, Ph 2 (Restore historic U.S. Customs House in Eagle.)	Completed	$40,000
US Department of Agriculture (USDA)/ Rural Development (RD)	2003	Funded	Fire Response Equipment & Training	Completed	$66,025
DOT/PF	2003	Funded	Eagle Road Improvements. Rebuild and surface 2 miles of the Taylor Highway within the City Limits of Eagle.	Completed	$35,000
DCRA	2002	Funded	City Building Repairs & Improvements - Capital Matching	Completed	$10,526
ANTHC	2002	Funded	Water service lines and septic systems to 3 homes. 1st Quarter FY2006: No activity this quarter.	Complete	$165,000
DCRA	2001	Funded	Building Repairs and Improvements - Capital Matching	Completed	$10,526
ANTHC	2001	Funded	Watering point construction. Construction is complete. No work was completed this quarter. Project closeout activities should commence next quarter.	Complete	$22,000
Bureau of Indian Affairs (BIA)	2001	Funded	Grade & Drain Streets	Completed	$450,000
DCRA	2001	Funded	Surface Main Roads, Dust Control - Capital Matching	Completed	$15,789
DCRA	2000	Funded	Dust Control - Capital Matching	Completed	$15,789
DCRA	2000	Funded	Emergency Road Repair - Capital Matching	Completed	$10,000

Table 6-4 Completed Projects – City of Eagle

Lead Agency	Fiscal Year	Status	Project Description/Comments	Project Stage	Total Cost
Alaska Energy Authority (AEA)/ Bulk Fuel (BF)	1999	Funded	Bulk Fuel Construction. OTHER FUNDING: Denali Commission $14.0	Completed	$28,000
DCRA	1999	Funded	Dust Control - Capital Matching	Completed	$26,316
DCRA	1998	Funded	Wellhouse Stabilization - Capital Matching	Completed	$15,789
DCRA	1998	Funded	Emergency Road Repair - Capital Matching	Completed	$10,526
DCRA	1997	Funded	Well Repairs - Legislative Grant	Completed	$11,558
DCRA	1997	Funded	Landfill Site Development. RDA Grant	Completed	$21,700
DCRA	1997	Funded	Road Preparation/Dust Control - Capital Matching	Completed	$26,316
DCRA	1996	Funded	Road Preparation/Dust Control - Capital Matching	Completed	$26,316
DCRA	1995	Funded	Riverbank Stabilization - Capital Matching	Completed	$26,316
DCRA	1994	Funded	Road Preparation/Dust Control - Capital Matching	Completed	$26,316
DOT/PF	1993	Funded	Road Preparation/Dust Control	Completed	$25,000
DCRA	1992	Funded	Well Site - Legislative Grant	Completed	$25,000
DOT/PF	1990	Funded	Airport Runway Improvements	Completed	$1,429,660

(DCRA 2013)

Native Village of Eagle Completed Projects

Table 6-5 lists the Native Village of Eagle's identified "completed" infrastructure improvement projects. They provide a depiction of the community's ongoing development trends and focus toward improving aging infrastructure.

Table 6-5 Completed Projects – Native Village of Eagle

Lead Agency	Fiscal Year	Recipient	Project Description/Comments	Project Stage	Total Cost
Division of Community and Regional Affairs (DCRA)	2010	Eagle Village Council	American Recovery and Reinvestment Act (ARRA)	Declined	$0
Housing and Urban Development (HUD)	2007	Funded	Indian Housing Block Grant (IHBG)/ Native American Housing Assistance And Self Determination Act (NAHASDA) administration, operating & construction funds	Construction	$58,892
HUD	2006	Funded	IHBG/NAHASDA administration, operating & construction funds	Completed	$58,568
DCRA	2006	Funded	Eagle Village Community Hall and Office Complex Renovation - Legislative Grant	Completed	$50,000
HUD	2005	Funded	IHBG/NAHASDA administration, operating & construction funds	Completed	$57,179
HUD	2004	Funded	IHBG/NAHASDA administration, operating & construction funds	Completed	$62,060
HUD	2003	Funded	IHBG/NAHASDA administration, operating & construction funds	Completed	$81,124
DCRA	2003	Funded	CP&I/Multi-purpose Facility - Capital Matching	Completed	$27,950

Table 6-5 Completed Projects – Native Village of Eagle

Lead Agency	Fiscal Year	Recipient	Project Description/Comments	Project Stage	Total Cost
HUD	2002	Funded	IHBG/NAHASDA administration, operating & construction funds	Completed	$72,181
DCRA	2002	Funded	Community Center and Office Site Telephone System Purchase - Capital Matching	Completed	$26,544
HUD	2001	Funded	IHBG/NAHASDA administration, operating & construction funds	Completed	$73,133
DCRA	2001	Funded	New Community Center Construction - Capital Matching	Completed	$58,721
HUD	2000	Funded	IHBG/NAHASDA administration, operating & construction funds	Completed	$67,576
DCRA	2000	Funded	CF&E/Community Center - Capital Matching	Completed	$84,143
DCRA	2000	Funded	Community Facilities and Equipment - Capital Matching	Completed	$14,895
Department of Environmental Conservation (DEC)/ Village Safe Water (VSW)	2000	Funded	Planning/Feasibility Study for Sanitation Facilities OTHER FUNDING: EPA $50,000.	Completed	$75,000
DCRA	2000	Funded	Community Facilities & Equipment/Community Center - Legislative Grant	Completed	$26,300
HUD	1999	Funded	IHBG/NAHASDA administration, operating & construction funds	Completed	$69,424
HUD	1998	Funded	IHBG/NAHASDA administration, operating & construction funds	Completed	$78,570
DCRA	1997	Funded	Refuse Collection Vehicle Purchase - Capital Matching	Completed	$10,523
DCRA	1997	Funded	Community Hall Renovation - Capital Matching	Completed	$15,790
DCRA	1995	Funded	Water & Sewer Project - Capital Matching	Completed	$27,685
HUD/ Alaska Housing Authority Corporation (AHFC)	1994	Funded	Construct 7 Mutual Help Housing Units Construction begun Summer 95	Completed	$1,253,842
DCRA	1994	Funded	Housing Relocation, Access Road - Legislative Grant. ED 36	Completed	$35,000
DCRA	1993	Funded	Generator Building - Legislative Grant	Completed	$35,000
Alaska Energy Authority (AEA)	1992	Funded	Electric Distribution System Rebuild Replace overhead distribution system; poles, transformers, lines. Village contributing new building for standby generator	Completed	$136,250

(DCRA 2013)

6.3.1.3 Existing Critical Facilities

A critical facility is defined as a facility that provides essential products and services to the general public, such as preserving the quality of life in the City 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 department 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 City's critical facilities and infrastructure are listed in Table 6-6.

Table 6-6 Critical Facilities and Infrastructure

Facilities	Number of Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Cultural	Earthquake	Erosion	Flood	Ground Failure	Weather (Severe)	Wildland Fire
Government	1	City office	1st Street	Unknown	Unknown	$75,000	W1	*Unidentified*	X			X	X	X
	6	Tribal and Workforce Offices	19 New Village Road	Unknown	Unknown	$300,000	W1		X	X		X	X	X
	4	National Park Service Headquarters	Outside City Limits	64.78989	-141.19997	125,000	W1		X	X	X	X	X	X
	1	US Post Office	Jefferson Street	Unknown	Unknown	$200,000	Log 1		X			X	X	X
Emergency Response	0	Eagle Volunteer Fire Dept. & Emergency Medical Services	1st Street	Unknown	Unknown	$175,000	W1		X		X	X	X	X
	1	VPSO Building	New Village Road	Unknown	Unknown	50,000	W1		X			X	X	X
Educational	21	Eagle Community School (P-12)	168 3rd Street	64.78668	-141.19949	$1,500,000	W1		X			X	X	X

Table 6-6 Critical Facilities and Infrastructure

Facilities	Number of Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Cultural	Earthquake	Erosion	Flood	Ground Failure	Weather (Severe)	Wildland Fire
Medical	3	Eagle Village Medical Clinic	Main Street	Unknown	Unknown	$2,610,012	W1		X			X	X	X
Community	0	St. Paul's Episcopal Log Church	Water Street	Unknown	Unknown	$150,000	W1		X	X	X	X	X	X
	1	Eagle Bible Chapel	4th Street	Unknown	Unknown	$75,000	W1		X			X	X	X
	0	Eagle Village Church	*Future Construction*	Unknown	Unknown	$85,000	W2		X			X	X	X
	1	Church Services f/ residence	Berry Street	Unknown	Unknown	$75,000	Log 1		X			X	X	X
	10	Charlie's Hall	New Village Road	Unknown	Unknown	$85,000	W2		X	X		X	X	X
	10	O'Brien Creek Lodge & Tavern	Outside City Limits	64.4425	-141.3402	$2,000,000	W2		X	X		X	X	X
	0	Historic School House	4th Street	Unknown	Unknown	$75,000	W1		X	X		X	X	X
	2	Eagle Trading Store	1st Street	Unknown	Unknown	$2,000,000	W3		X	X	X	X	X	X
	1	Eagle Public Library	2nd Street	Unknown	Unknown	$75,000	Log 1		X			X	X	X
	1	Judge James Wickersham's Historic Courthouse & Fish Brothers Cabin	1st Street	Unknown	Unknown	$200,000	W2		X			X	X	X
	1	Redmen Hall	3rd Street	Unknown	Unknown	$100,000	Log 1		X			X	X	X
	0	Fort Egbert Officer's Quarters	Parade Ground(BLM)	Unknown	Unknown	$75,000	W2		X			X	X	X
	0	Granary houses, Fort Egbert				$75,000	W1		X			X	X	X
	0	Mule Barn, Fort Egbert				$200,000	W1		X			X	X	X
	0	Quarter Master's Station, Fort Egbert				$75,000	W1		X			X	X	X
	0	Waterwagon Shed, Fort Egbert				$50,000	W1		X			X	X	X
	0	Historic City Hall	Chamberlain Street	Unknown	Unknown	$100,000	Log 1		X			X	X	X

Table 6-6 Critical Facilities and Infrastructure

Facilities	Number of Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Cultural	Earthquake	Erosion	Flood	Ground Failure	Weather (Severe)	Wildland Fire
Roads	0	Approximate Gravel Road Miles at $200,000 per mile:	6 Total Miles	N/A	N/A	$1,200,000	HRD2		X			X	X	X
		1st Street							X			X	X	X
		2nd Street							X			X	X	X
		3rd Street							X			X	X	X
		4th Street							X			X	X	X
		7th Street							X			X	X	X
		8th Street							X			X	X	X
		9th Street							X			X	X	X
		A Street							X			X	X	X
		Airport Road							X			X	X	X
		Alberts Avenue							X			X	X	X
		Amundsen Street							X			X	X	X
		Berry Street							X			X	X	X
		Chamberlain Street							X			X	X	X
		Eagle Road							X			X	X	X
		Front Street							X	X	X	X	X	X
		Golden Avenue							X			X	X	X
		Jeanie Lane							X			X	X	X
		Jefferson Street							X			X	X	X
		Judy E Lane							X			X	X	X
		Lincoln Avenue							X			X	X	X
		Mission Road							X			X	X	X
		New Village Road							X			X	X	X
		Old Boat Landing Road							X			X	X	X
		Old Camp Road							X			X	X	X

Table 6-6 Critical Facilities and Infrastructure

Facilities	Number of Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Cultural	Earthquake	Erosion	Flood	Ground Failure	Weather (Severe)	Wildland Fire
		Tractor Trail							X			X	X	X
		Taylor Highway							X			X	X	X
		Washington Avenue							X			X	X	X
		Water Street							X			X	X	X
Bridge	None													
Transportation	0	Airport (Runway 6)	Eagle Road	64.778083	-141.1496111	$1,475,906	AFO		X	X		X	X	X
	0	Airport (Runway 24)	Eagle Road				AFO		X	X		X	X	X
	1	Service/Maintenance Shop 1	Parade Ground(BLM)	Unknown	Unknown	$1,000,000	S1L		X			X	X	X
Utilities	0	Eagle Community School Well	168 3rd Street	64.78653	-141.20764	$100,000	PWE		X			X	X	X
	0	BLM - West Fork Campground	1/2 mile outside City Limits	63.88842	-142.23894	$200,000	N/A		X			X	X	X
	0	Eagle City Well	2nd Street	64.78886	-141.19989	$200,000	PWE		X			X	X	X
	2	Water Treatment Plan, Washeteria & Temporary Store	2nd Street	Unknown	Unknown	$105,000			X			X	X	X
	1	Power Generation Plant	4th Street	Unknown	Unknown	$1,000,000	EPPS		X			X	X	X
	0	Fuel Storage Tanks (>500gal)	4th Street	Unknown	Unknown	$1,000,000	OTF		X			X	X	X
	0	Landfill	Main Street	Eagle Village	Unknown	$1,000,000	N/A		X			X	X	X
	0	School Radio Transmitter		64.78668	-141.19949	$20,000	CBO		X			X	X	X
	0	APT Telephone	2nd Street	Unknown	Unknown	$1,000,000	CBO		X			X	X	X
	0	Eagle Village Fuel Storage Tanks	Varied	Eagle Village	Unknown	$25,000	OTF		X			X	X	X
Total Occ	68				Total Damages	18,960,918								

(City & Village 2013, DHS&EM 2009a)

6.4 REPETITIVE LOSS PROPERTIES

This section estimates the number and type of structures at risk to repetitive flooding. (Properties which have experienced RL, the extent of flood depth, and damage potential.)

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. NFIP 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.

6.4.1.1 NFIP Participation

The City of Eagle does not participate in the NFIP neither do they have a repetitive flood property inventory that meets NFIP criteria as the loss thresholds are substantially below FEMA values.

6.5 VULNERABILITY ANALYSIS 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 Project 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 geospatial information system (GIS) based hazard mapping information was available.

Replacement structure and contents values were determined by the community for their physical assets. The community's aggregate exposure was calculated by assuming the worst-case scenario (that is, the asset would be completely destroyed and would have to be replaced) for each physical asset located within a hazard area. 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.

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

6.7 VULNERABILITY EXPOSURE ANALYSIS

6.7.1 Vulnerability Exposure Analysis – City of Eagle

The following discussion contains hazard descriptive analysis and information obtained from the Project Team for the City of Eagle and the Native Village of Eagle. The exposure analysis results for loss estimations in the City are summarized in Tables 6-7 and 6-8.

Table 6-7 City of Eagle's Potential Hazard Exposure Analysis (HEA) – Critical Facilities

		Government and Emergency Response		Educational		Medical		Community	
Hazard Type	Methodology	* # Bldgs / # Occ	Value ($)	* # Bldgs / # Occ	Value ($)	* # Bldgs / # Occ	Value ($)	* # Bldgs / # Occ	Value ($)
Earthquake	Descriptive	4/6	575,000	1/21	1,500,000	0/0	0	18/17	5,405,000
Erosion	Within 300 ft of erosion areas	1/4	125,000	0/0	0	0/0	0	18/17	4,250,000
Flood	Descriptive	1/4	125,000	0/0	0	0/0	0	3/2	2,175,000
Ground Failure	Descriptive	4/6	575,000	1/21	1,500,000	0/0	0	18/17	5,405,000
Severe Weather	Descriptive	4/6	575,000	1/21	1,500,000	0/0	0	18/17	5,405,000
Wildland Fire	Descriptive	4/6	575,000	1/21	1,500,000	0/0	0	18/17	5,405,000

Table 6-8 City of Eagle's Potential HEA – Critical Infrastructure

		Highway		Bridges		Transportation Facilities		Utilities	
Hazard Type	Methodology	Miles	Value ($)	No.	Value ($)	# Bldgs / # Occ	Value ($)	# Bldgs / # Occ	Value ($)
Earthquake	Descriptive	6	1,200,000	0	0	3/1	2,475,906	8/3	3,625,000
Erosion	Within 300 ft of erosion areas	~1	200,000	0	0	2/0	1,475,906	0/0	0
Flood	Descriptive	~1	200,000	0	0	0/0	0	0/0	0
Ground Failure	Descriptive	6	1,200,000	0	0	3/1	4,650,000	8/3	3,625,000
Severe Weather	Descriptive	6	1,200,000	0	0	3/1	4,650,000	8/3	3,625,000
Wildland Fire	Descriptive	6	1,200,000	0	0	3/1	4,650,000	8/3	3,625,000

6.7.2 Vulnerability Exposure Analysis – Native Village of Eagle

The following discussion contains hazard descriptive analysis and information obtained from the Project Team for the Native Village of Eagle. The exposure analysis results for loss estimations in the Village are summarized in Tables 6-9 and 6-10.

Narrative hazard analysis for both communities is provided in Section 6.7.3

6.7.3 Vulnerability Exposure Analysis – Native Village of Eagle

The following discussion contains hazard descriptive analysis and information obtained from the Project Team for the Native Village of Eagle. The exposure analysis results for loss estimations in the City are summarized in Tables 6-9 and 6-10.

Table 6-9 Native Village of Eagle's Potential HEA – Critical Facilities

		Government and Emergency Response		Educational		Medical		Community	
Hazard Type	Methodology	* # Bldgs / # Occ	Value ($)	* # Bldgs / # Occ	Value ($)	* # Bldgs / # Occ	Value ($)	* # Bldgs / # Occ	Value ($)
Earthquake	Descriptive	2/7	350,000	0/0	0	1/3	2,610,012	3/10	195,000
Erosion	Within 300 ft of erosion areas	1/6	300,000	0/0	0	1/3	2,610,012	1/6	110,000
Flood	Descriptive	0/0	0	0/0	0	0/0	0	1/0	25,000
Ground Failure	Descriptive	2/7	350,000	0/0	0	1/3	2,610,012	3/10	195,000
Severe Weather	Descriptive	2/7	350,000	0/0	0	1/3	2,610,012	3/10	195,000
Wildland Fire	Descriptive	2/7	350,000	0/0	0	1/3	2,610,012	3/10	195,000

Table 6-10 Native Village of Eagle's Potential HEA – Critical Infrastructure

		Highway		Bridges		Transportation Facilities		Utilities	
Hazard Type	Methodology	Miles	Value ($)	No.	Value ($)	# Bldgs / # Occ	Value ($)	# Bldgs / # Occ	Value ($)
Earthquake	Descriptive	~1	200,000	0	0	0	0	2/0	1,025,000
Erosion	Within 300 ft of erosion areas	~1	200,000	0	0	0	0	0/0	0
Flood	Descriptive	~1	200,000	0	0	0	0	0/0	0
Ground Failure	Descriptive	~1	1,200,000	0	0	0	0	2/0	1,025,000
Severe Weather	Descriptive	~1	1,200,000	0	0	0	0	2/0	1,025,000
Wildland Fire	Descriptive	~1	1,200,000	0	0	0	0	2/0	1,025,000

6.7.4 Exposure Analysis – Hazard Narrative Summaries

Earthquake

The City and surrounding area could potentially experience moderate earthquake ground movement that may result in infrastructure damage. Future impacts may be seen or felt based on past events. Although all structures are exposed to earthquakes, buildings within the City constructed with wood have slightly less vulnerability to the effects of earthquakes than more urban structures fabricated with masonry.

Based on earthquake probability (PGA) maps produced by the USGS, the entire City area has limited risk of experiencing earthquake impacts as a result of its close proximity to known earthquake faults (Section 5.3.1.3, Figure 5-2).

It is “possible” that impacts to the community such as “moderate” ground movement may result in infrastructure damage and personal injury. The entire existing, transient, and future population; residential structures, and critical facilities are exposed to the effects of “moderate” earthquake events.

The City of Eagle’s potential damages and losses include:

- 86 people in 146 residences (approximate value $12,410,000)
- Six people in four government and emergency response facilities (approximate structure value $575,000)
- 21 people in one educational facilities (approximate value $1,500,000)
- 18 people in 14 community facilities (approximate value $5,405,000)
- Six road system miles (approximate value $1,200,000)
- Three people in one transportation facilities (approximate value $2,475,906)
- Thee people in eight utility facilities (approximate value $3,625,000)

The Native Village of Eagle’s potential damages and losses include:

- 67 people in 75 residences (approximate structure value $6,375,000)
- Seven people in two government and emergency response facilities (approximate structure value $350,000)
- Three people in one medical facility (approximate structure value $2,610,012)
- Ten people in three community facilities (approximate structure value $195,000)
- One road system miles (approximate value $200,000)
- Two utility facilities (approximate value $1,025,000)

Impacts to future populations, residential structures, critical facilities, and infrastructure are anticipated at the same historical impact level.

Erosion

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

Based on local knowledge, areas within the City affected by erosion are located adjacent to the Yukon River or experience snow and rain run-off damage (Section 5.3.2.3).

The City of Eagle's potential damages and losses include:

- 75 people in 25 residences (approximate value $2,125,000)
- Four people in one government and emergency response facilities (approximate structure value $125,000)
- 17 people in 18 community facilities (approximate structure value $4,250,000)
- Approximately one road system mile (approximate value $200,000)
- Two transportation facilities (approximate value $1,475,906)

The Native Village of Eagle's potential damages and losses include:

- 24 people in eight residences (approximate structure value $680,000)
- Six people in one government and emergency response facilities (approximate structure value $300,000)
- Three people in one medical facility (approximate structure value $2,610,012)
- Six people in one community facility (approximate structure value $110,000)
- Approximately one road system mile (approximate value $200,000)

Impacts to future populations, residential structures, critical facilities, and infrastructure are anticipated at the same impact level.

Flood

Typical flood impacts include water damage to structures and contents, roadbed erosion and damage, boat strandings, areas of standing water in roadways; and fuel tanks, power lines, or other infrastructure damages or displacements. Buildings on slab foundations, not located on raised foundations, and/or not constructed with materials designed to withstand flooding events (e.g., cross vents to allow water to pass through an open area under the main floor of a building) are more vulnerable to the impacts of flooding. Structures located within close proximity to the Yukon River are very susceptible to ice jam block ice damage or total destruction (see Section 5.3.3.3).

No detailed 100 year flood analysis has been prepared for the City neither is does the USACE Floodplain Manager provide flood information or a 100 year floodplain map for the Eagle area.

The City of Eagles threatened facility damages and losses include:

- 75 people in 25 residences (approximate value $2,125,000)
- Four people in one government and emergency response facilities (approximate value $125,000)
- Two people in three community facilities (approximate value $2,175,000)
- Approximately one road system mile (approximate value $200,000)

The Native Village of Eagle's potential damages and losses include:

- One community facility (approximate structure value $25,000)
- Approximately one road system mile (approximate value $200,000)

The City anticipates that impacts to future populations, residential structures, critical facilities, and infrastructure will be at the same historical impact level.

Ground Failure

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

The potential ground failure impacts from landslides, mudslides, melting permafrost, and subsidence can be widespread. Potential debris flows and landslides can impact transportation, utility systems, and water and waste treatment infrastructure along with public, private, and business structures located along roadways, adjacent to steep slopes, along riverine embankments, or within alluvial fans or natural drainages. Response and recovery efforts will likely vary from minor cleanup to more extensive utility system rebuilding. Utility disruptions are usually local and terrain dependent. Damages may require reestablishing electrical, communication, and other utility connections occurring from specific breakage points. Initial debris clearing from emergency routes and high traffic areas may be required. Water and wastewater utilities may need treatment to quickly improve water quality by reducing excessive water turbidity and reestablishing waste disposal capability.

Ground Failure hazards periodically cause structure and infrastructure displacement due to ground shifting, sinking, and upheaval. According to mapping completed by the DGGS, The Eagle area has discontinuous permafrost (see Section 5.3.4.3).

The City of Eagle's potential damages and losses include:

- 86 people in 146 residences (approximate structure value $12,410,000)
- Six people in four government and emergency response facilities (approximate structure value $575,000)
- 21 people in one educational facilities (approximate structure value $1,500,000)
- 18 people in 14 community facilities (approximate structure value $5,405,000)
- Six road system miles (approximate structure value $1,200,000)

- Three people in one transportation facility (approximate structure value $2,475,906)
- Thee people in eight utility facilities (approximate value $3,625,000)

The Native Village of Eagle's potential damages and losses include:

- 67 people in 75 residences (approximate structure value $6,375,000)
- Seven people in two government and emergency response facilities (approximate structure value $350,000)
- Three people in one medical facility (approximate structure value $2,610,012)
- Ten people in three community facilities (approximate structure value $195,000)
- One road system miles (approximate value $200,000)
- Two utility facilities (approximate value $1,025,000)

Impacts to future populations, residential structures, critical facilities, and infrastructure are anticipated at the same impact level.

Severe Weather

Impacts associated with severe weather events includes roof collapse, trees and power lines falling, damage to light aircraft and sinking small boats, injury and death resulting from snow machine or vehicle accidents, overexertion while shoveling heavy snow. A quick thaw after a heavy snow can also cause substantial flooding. Impacts from extreme cold include hypothermia, halting transportation from fog and ice, congealed fuel, frozen pipes, utility disruptions, frozen pipes, and carbon monoxide poisoning. Additional impacts may occur from secondary weather hazards or complex storms such as extreme high winds combined with freezing rain. Section 5.3.5.3 provides additional detail regarding severe weather impacts. Buildings that are older and/or not constructed with materials designed to withstand heavy snow and wind loads (e.g., hurricane ties on crossbeams) are more vulnerable to severe weather damage.

Based on information provided by the City, Native Village, and the National Weather Service, the entire existing, transient, and future population, residential structures, and critical facilities are exposed to future severe weather impacts.

The City of Eagle's potential damages and losses include:

- 86 people in 146 residences (approximate structure value $12,410,000)
- Six people in four government and emergency response facilities (approximate structure value $575,000)
- 21 people in one educational facilities (approximate structure value $1,500,000)
- 18 people in 14 community facilities (approximate structure value $5,405,000)
- Six road system miles (approximate structure value $1,200,000)
- Three people in one transportation facility (approximate structure value $2,475,906)
- Thee people in eight utility facilities (approximate value $3,625,000)

The Native Village of Eagle's potential damages and losses include:

- 67 people in 75 residences (approximate structure value $6,375,000)
- Seven people in two government and emergency response facilities (approximate structure value $350,000)
- Three people in one medical facility (approximate structure value $2,610,012)
- Ten people in three community facilities (approximate structure value $195,000)
- One road system miles (approximate value $200,000)
- Two utility facilities (approximate value $1,025,000)

Impacts to future populations, residential structures, critical facilities, and infrastructure are anticipated at the same impact level.

Wildland Fire

Impacts associated with a wildland fires include the potential for loss of life and property. It can also impact pets and wildlife, destroys forest resources, and contaminates water supplies. Buildings closer to the outer edge of town, with heavy vegetation surrounding the structure, and those constructed with wood are some of the buildings that are more vulnerable to wildfire damage or destruction.

According to the Alaska Fire Service, there are no wildland fire areas within City or Village boundaries. However, 151 wildland fires have occurred within a 50-mile radius of the City (see Section 5.3.6.2). There is a high potential for wildland fire to interface with City and Native Village areas.

The City of Eagle's potential damages and losses include:

- 86 people in 146 residences (approximate structure value $12,410,000)
- Six people in four government and emergency response facilities (approximate structure value $575,000)
- 21 people in one educational facilities (approximate structure value $1,500,000)
- 18 people in 14 community facilities (approximate structure value $5,405,000)
- Six road system miles (approximate structure value $1,200,000)
- Three people in one transportation facility (approximate structure value $2,475,906)
- Thee people in eight utility facilities (approximate value $3,625,000)

The Native Village of Eagle's potential damages and losses include:

- 67 people in 75 residences (approximate structure value $6,375,000)
- Seven people in two government and emergency response facilities (approximate structure value $350,000)
- Three people in one medical facility (approximate structure value $2,610,012)

- Ten people in three community facilities (approximate structure value $195,000)
- One road system miles (approximate value $200,000)
- Two utility facilities (approximate value $1,025,000)

Impacts to future populations, residential structures, critical facilities, and infrastructure are anticipated at the same impact level.

6.8 FUTURE DEVELOPMENT

The Planning Team stated the City's infrastructure is aging. For example, the existing well is a 100-year old, hand dug well which experiences ground water intrusion resulting in negative water quality tests by the State's Department of Conservation (DEC). There is a notice on the well stating residents to boil water to assure their safety.

Eagle Village is in the City's fire protection zone which enables them to use the well and receive ambulance support.

Table 6-11 delineates the City of Eagle's future, planned, and funded projects and their tentative completion status.

Table 6-11 City of Eagle's Planned and Funded Projects

Lead Agency	Fiscal Year	Project Status	Project Description/Comments	Project Stage	Total Cost
Denali	2009	Funded	Hydrokinetic Project Completion. This award provides $1,630,576 to the ACEP to complete the Eagle Hydrokinetic Project. The Denali Commission previously awarded Alaska Power Company (APC) a grant to develop a hydrokinetic project in Eagle, Alaska.	In-Progress	$1,630,576
Denali	2007	Funded	Hydrokinetic Turbine Project. The electrical generation facilities in Eagle are currently listed as #31 on the Commissions statewide energy deficiency list. Alaska Power Company (APC) has completed initial design and permitting for a hydrokinetic Turbine to be installed in the Yukon River...	3-year Operation & Evaluation Period	$2,363,319

(DCRA 2013)

Table 6-12 delineates the Native Village of Eagle's future, planned, and funded projects and their tentative completion status.

Table 6-12 Native Village of Eagle's Planned and Funded Projects

Lead Agency	Fiscal Year	Project Status	Project Description/Comments	Project Stage	Total Cost
Alaska Native Tribal Health Consortium (ANTHC)	2010	Funded	Construct a new health clinic in the Native Village of Eagle, Alaska.	Construction	$2,610,012

(DCRA 2013)

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7

MITIGATION STRATEGY

Section Seven outlines the six-step process for preparing a mitigation strategy including:

1. Identifying each jurisdiction's existing authorities for implementing mitigation action initiatives
2. NFIP Participation
3. Developing Mitigation Goals
4. Identifying Mitigation Actions
5. Evaluating Mitigation Actions
6. Implementing the Mitigation Action Plan (MAP)

DMA requirements for developing a comprehensive mitigation strategy include:

DMA 2000 Requirements
Identification and Analysis of Mitigation Actions §201.6(c)(3): [The plan shall include the following:] A *mitigation strategy* that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools. §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. §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. §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. §201.6(c)(3)(iv): [For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan. Requirement §201.6(c)(4): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvements, when appropriate.
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?
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? *(Addressed in Section 6.4)*
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards?
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?
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?
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?
Source: FEMA, October 2011.

7.1 CITY OF EAGLE AND THE NATIVE VILLAGE OF EAGLE'S CAPABILITY ASSESSMENT

The City's capability assessment reviews the technical and fiscal resources available to the community.

DMA 2000 Requirements
Incorporation into Existing Planning Mechanisms §201.6(c)(3): [The plan shall include the following:] A *mitigation strategy* that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools.
ELEMENT C. Incorporate into Other Planning Mechanisms
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?
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?
Source: FEMA, October 2011.

This section outlines the resources available to the City of Eagle and the Native Village of Eagle for mitigation and mitigation related funding and training. Tables 7-1, 7-2, and 7-3 delineate the City's regulatory tools, technical specialists, and financial resource available for project management. Additional funding resources are identified in Appendix A.

Table 7-1 Eagle and Eagle Village's Regulatory Tools

Regulatory Tools (ordinances, codes, plans)	Existing Yes/No?	Comments (Year of most recent update; problems administering it, etc.)
Comprehensive Plan	No	
City Land Use Plan	No	City: Manages these initiatives.
Tribal Land Use Plan	No	Village: Manages tribal land use initiatives
Emergency Response Plan	No	City: Can exercise this authority. Village: this authority is not available
Wildland Fire Protection Plan	No	City: Can exercise this authority. Village: this authority is not available
Building code	No	City: Can exercise this authority. Village: this authority is not available
Zoning ordinances	No	City: Can exercise this authority. Village: this authority is not available
Subdivision ordinances or regulations	No	City: Can exercise this authority. Village: this authority is not available
Special purpose ordinances	No	City: Can exercise this authority. Village: this authority is not available

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 7-2 Eagle and Eagle Village's Technical Specialists for Hazard Mitigation

Staff/Personnel Resources	Yes / No	Department/Agency and Position
Planner or engineer with knowledge of land development and land management practices	No	City and Village can work with appropriate agency specialists or contract for these services
Engineer or professional trained in construction practices related to buildings and/or infrastructure	No	City and Village can work with appropriate agency specialists or contract for these services
Planner or engineer with an understanding of natural and/or human-caused hazards	No	City and Village can work with appropriate agency specialists or contract for these services
Floodplain Manager	No	City and Village can work with appropriate agency specialists (i.e. State Floodplain Coordinator)
Surveyors	No	The City and Village can contract for these services.
Staff with education or expertise to assess the jurisdiction's vulnerability to hazards	No	The City and Village has staff with this knowledge
Personnel skilled in Geospatial Information System (GIS) and/or Hazards Us-Multi Hazard (Hazus) software	No	The City and Village can contract for these services.
Scientists familiar with the hazards of the jurisdiction	No	City can work with appropriate agency specialists such as the U.S. Fish & Wildlife Service (USFWS) and Fish & Game (ADF&G).
Emergency Manager	Yes	City or Tribal Administrators as applicable
Finance (Grant writers)	Yes	City and Tribal Finance Officers
Public Information Officer	Yes	City or Tribal Administrators as applicable

Table 7-3 City and Village's Financial Resources Available for Hazard Mitigation

Financial Resource	Accessible or Eligible to Use for Mitigation Activities
General funds	City: Can exercise this authority with voter approval Village: Village may provide funding with Tribal Council approval using tribal funding mechanisms.
Community Development Block Grants	City: Can exercise this authority with voter approval Village: Village may provide funding with Tribal Council approval using tribal funding mechanisms.
Capital Improvement Project Funding	City: Can exercise this authority with voter approval Village: Village may provide funding with Tribal Council approval.
Authority to levy taxes for specific purposes	City: Can exercise this authority with voter approval Village: this authority not available to the Village.
Incur debt through general obligation bonds	City: Can exercise this authority with voter approval Village: this authority not available to the Village.
Incur debt through special tax and revenue bonds	City: Can exercise this authority with voter approval Village: this authority not available to the Village.
Incur debt through private activity bonds	City: Can exercise this authority with voter approval Village: this authority not available to the Village.
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

Table 7-3 City and Village's Financial Resources Available for Hazard Mitigation

Financial Resource	Accessible or Eligible to Use for Mitigation Activities
	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. ***Note:*** *Neither the City nor the Village qualify for this funding source because they do not participate in the NFIP.*
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.

The Planning Team developed the mitigation goals and potential mitigation actions to address identified potential hazard impacts for the City of Eagle and the Native Village of Eagle within Section 5.3.

7.2 DEVELOPING MITIGATION GOALS

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

DMA 2000 Requirements
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 that describe what a community wants to achieve in terms of hazard and loss prevention. Goal statements are typically long-range, policy-oriented statements representing community-wide visions. As such, eleven goals were developed to reduce or avoid long-term vulnerabilities to the identified hazards (Table 7-4).

Table 7-4 City's and Village's Mitigation Goals

No.	Goal Description
Multi-Hazards (MH)	
MH 1	Promote recognition and mitigation of all natural and manmade hazards that affect the City of Eagle (City) and the Native Village of Eagle (Village).
MH 2	Promote cross-referencing mitigation goals and actions with other City and Tribal planning mechanisms and projects.
MH 3	Reduce possibility of losses from all natural and manmade hazards that affect the City and Village.
Natural Hazards	
EQ 4	Reduce structural vulnerability to earthquake (ER) damage.
ER 5	Reduce erosion (ER) damage and loss possibility.
FL 6	Reduce flood (FL) damage and loss possibility.
GF 7	Reduce ground failure (GF) damage and loss possibility.
SW 8	Reduce structural vulnerability to severe weather (SW) damage.
WF 9	Reduce structural vulnerability to Wildland Fire (WF) damage.

7.3 IDENTIFYING MITIGATION ACTIONS

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

DMA 2000 Requirements
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 developing mitigation goals, the Planning Team reviewed a comprehensive list of potential mitigation actions that were identified during this HMP development process.

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.

On January 13, 2014, the City's Planning Team selected seven ongoing and 19 new natural hazard mitigation actions for potential Mitigation Action Plan (MAP) implementation during the five-year life cycle of this HMP.

On January 11, 2014, the Village's Planning Team selected four ongoing and 11 new natural hazard mitigation actions for potential Mitigation Action Plan (MAP) implementation during the five-year life cycle of this HMP.

The Planning Teams placed particular emphasis on projects and programs that reduce the effects of hazards on both new and existing buildings and infrastructure as well as facilities located in potential flood zones to comply with NFIP requirements should the City or Village join the NFIP.

The Planning Teams considered projects from a comprehensive list for each hazard type. Tables 7-5 the City's and Village's (respectively) categorizes potential actions' status as Considered, Selected, or Ongoing. They identified numerous "ongoing" mitigation actions currently in-process or those that were listed in other City planning documents. The Planning Teams then selected "newly identified" actions identified through this plan development activity that would most benefit the community. Table 7-5 lists the City and Village of Eagle's potential mitigation action items. Village actions are preceded by a "T."

Table 7-5 Eagle City and Tribal Potential Mitigation Actions

(Ongoing and newly selected items were identified for MAP implementation)

Supports Goal No.	Hazard	Status *Considered Selected Ongoing Completed*	Action Description
Multi- Hazards (MH)			
MH 1	Promote recognition and mitigation of all natural hazards that affect the City of Eagle (City) and Native Village of Eagle (Village).	**S** **T/S**	Identify and pursue funding opportunities to implement mitigation actions.
		C **T/O**	Hold an annual or biennial "hazard meeting" to provide information to residents about recognition and mitigation of all natural hazards that affect the City of Eagle.
		S	Establish a formal role for the Hazard Mitigation Planning Team to develop a sustainable process to implement, monitor, review, and evaluate community wide mitigation actions.
		S	Develop, produce, and distribute information materials concerning mitigation, preparedness, and safety procedures for all identified natural hazards.
		C	Develop and implement strategies and educational outreach programs for debris management from natural hazard events.
		S **T/S**	Disseminate FEMA pamphlets to educate and encourage homeowners concerning structural and non-structural retrofit benefits.

Table 7-5 Eagle City and Tribal Potential Mitigation Actions

(Ongoing and newly selected items were identified for MAP implementation)

Supports Goal No.	Hazard	Status *Considered Selected Ongoing Completed*	Action Description
Multi- Hazards (MH)			
		C	Develop outreach program to educate residents concerning benefits of increased seismic resistance and modern building code compliance during rehabilitation or major repairs for residences or businesses.
		C	Develop outreach program with school district contests having students develop, display, and explain mitigation projects or initiatives.
		S	Develop outreach program to educate residents concerning flood proofed wells, sewer/septic or other non-residential facilities.
		O	Identify critical facilities and vulnerable populations based on identified (and mapped where applicable) high hazard areas.
		O T/O	Identify evacuation routes away from high hazard areas and develop outreach program to educate the public concerning warnings and evacuation procedures.
		O	Acquire emergency warning sirens to communicate critical emergency warnings and alerts.
		C	Update public emergency notification procedures and develop an outreach program for potential hazard impacts or events.
MH 2	Cross reference Mitigation goals and actions with other City and Village.	**S T/S**	The City will strive to manage their existing plans to ensure they incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, and land use plans, etc. to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.
		C	Review ordinances and develop outreach programs to assure propane tanks are properly anchored and hazardous materials are properly stored and protected from known natural hazards such as flood or seismic events.
		S	Integrate the Mitigation Plan hazard analysis findings for enhanced emergency planning.
		C	Develop, incorporate, and enforce building ordinances commensurate with building codes to reflect survivability from flood, fire, wind, seismic, and other hazards to ensure occupant safety.
		C	Develop and incorporate mitigation provisions and recommendations into all community plans and community development processes to maintain protect critical infrastructure, residences, and population from natural hazard impacts.

Table 7-5 Eagle City and Tribal Potential Mitigation Actions

(Ongoing and newly selected items were identified for MAP implementation)

Supports Goal No.	Hazard	Status *Considered Selected Ongoing Completed*	Action Description
Multi- Hazards (MH)			
		S T/O	Prohibit new construction in identified mitigatable hazard impact areas (avalanche, flood, erosion, etc.) or require building to applicable building codes for other hazard impacts (earthquake, volcanic ash, weather, etc.).
		S	Identify and list repetitively flooded structures and infrastructure, analyze the threat to these facilities, and raise mitigation action priorities to protect the threatened population.
		C	Develop prioritized list of mitigation actions for threatened critical facilities and other buildings or infrastructure.
MH 3	Reduce possibility of losses from all natural hazards that affect the City and Village.	**O**	Acquire (buy-out), demolish, or relocate structures from hazard prone area (erosion, flood, ground failure, etc.) Property deeds "must be" restricted for open space uses for perpetuity to keep people from rebuilding in known hazard areas.
		S	Encourage utility companies to evaluate and harden vulnerable infrastructure elements for sustainability.
		C	Develop, implement, and enforce floodplain management ordinances.
Natural Hazards			
EQ 4	Reduce vulnerability of structures to earthquake damage.	None	This hazard is a minimal threat to the community
ER 5	Reduce possibility of damage and losses from erosion.	**O T/S**	Develop mitigation initiatives such as: Rip-rap (large rocks), sheet pilings, gabion baskets, articulated matting, concrete, asphalt, vegetation, or other armoring or protective materials to provide river bank protection.
		O	Harden culvert entrance bottoms with asphalt, concrete, rock, or similar material to reduce erosion or scour.
FL 6	Reduce the possibility of damage and losses from flooding.	**S**	Determine and implement most cost beneficial and feasible mitigation actions for locations with repetitive flooding, significant historical damages, or road closures.
		O (DOT) T/O (DOT)	Increase culvert sizes to increase their drainage capacity or efficiency.
		S	Construct water treatment system to improve water quality over existing community well structure which continually gets contaminated from Ice Jam Flood events
		T/S	Evaluate and modify Village Watering Point to provide residents a viable community watering source.

Table 7-5 Eagle City and Tribal Potential Mitigation Actions

(Ongoing and newly selected items were identified for MAP implementation)

Supports Goal No.	Hazard	Status *Considered Selected Ongoing Completed*	Action Description
Multi- Hazards (MH)			
			Residents currently haul water from the City of Eagle's well.
GF 7	Reduce possibility of damage and losses from ground failure.	C **T/S**	Promote permafrost sensitive construction practices in permafrost areas.
SW 8	Reduce vulnerability of structures to severe weather damage.	**T/S**	Develop and implement tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events.
		C	Develop, implement, and maintain partnership program with electrical utilities to use underground utility placement methods where possible to reduce or eliminate power outages from severe winter storms. Consider developing incentive programs.
		C	Develop personal use and educational outreach training for a "safe tree harvesting" program. Implement along utility and road corridors to prevent or reduce potential winter storm damage.
WF 9	Reduce vulnerability of population and infrastructure to wildland fire impacts.	**S**	Hold FireWise workshop to educate residents and contractors concerning fire resistant landscaping.
		S	Promote FireWise building siting, design, and construction processes and materials.
		S T/S	Provide wildland fire hazard outreach information in an easily distributed format for all residents.
		S	Develop, adopt, and enforce burn ordinances that controls outdoor burning, require burn permits, and restricts open campfires during identified weather periods (windy, dry, etc.).
		S	Develop outreach program to educate and encourage fire-safe construction practices for existing and new construction in high-risk areas.
		S	Identify, develop, implement, and enforce mitigation actions such as fuel breaks and reduction zones for potential wildland fire hazard areas.
		S T/S	Construct a firebreak around the community to provide wildfire protection.

7.4 EVALUATING AND PRIORITIZING MITIGATION ACTIONS

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

DMA 2000 Requirements: Mitigation Strategy - Implementation of Mitigation Actions
Implementation of Mitigation Actions §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 City evaluated and prioritized each of their selected mitigation actions in January, 2014; the Native Village valuated and prioritized each of their selected mitigation actions in February, 2014 to determine which actions would be included in their Mitigation Action Plan (MAP). The MAP represents mitigation projects and programs to be implemented for the City andVillage. To complete this task, the Planning Team first prioritized the hazards that were regarded as the most significant within the community (erosion, flood, ground failure, severe weather, and wildland fire).

The Planning Team reviewed the simplified social, technical, administrative, political, legal, economic, and environmental (STAPLEE) evaluation criteria (Table 7-7) and the Benefit-Cost Analysis Fact Sheet (Appendix E) to consider the opportunities and constraints of implementing each particular mitigation action. For each action considered for implementation, a qualitative statement is provided regarding the benefits and costs and, where available, the technical feasibility. A detailed cost-benefit analysis is anticipated as part of the application process for those projects the City chooses to implement.

Table 7-6 Evaluation Criteria for Mitigation Actions

Evaluation Category	Discussion "It is important to consider…"	Considerations
Social	The public support for the overall mitigation strategy and specific mitigation actions.	Community acceptance Adversely affects population
Technical	If the mitigation action is technically feasible and if it is the whole or partial solution.	Technical feasibility Long-term solutions Secondary impacts
Administrative	If the community has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary.	Staffing Funding allocation Maintenance/operations
Political	What the community and its members feel about issues related to the environment, economic development, safety, and emergency management.	Political support Local champion Public support

Table 7-6 Evaluation Criteria for Mitigation Actions

Evaluation Category	Discussion "It is important to consider…"	Considerations
Legal	Whether the community has the legal authority to implement the action, or whether the community must pass new regulations.	Local, State, and Federal authority Potential legal challenge
Economic	If the action can be funded with current or future internal and external sources, if the costs seem reasonable for the size of the project, and if enough information is available to complete a Federal Emergency Management Agency (FEMA) Benefit-Cost Analysis.	Benefit/cost of action Contributes to other economic goals Outside funding required FEMA Benefit-Cost Analysis
Environmental	The impact on the environment because of public desire for a sustainable and environmentally healthy community.	Effect on local flora and fauna Consistent with community environmental goals Consistent with local, state, and Federal laws

On January and February, 2014, the City and Native Village prioritized their respectively selected natural hazard mitigation actions that were selected to carry forward into the MAP.

The hazard mitigation City and Village considered each hazard's history, extent, and probability to determine each potential actions priority. A rating system based on high, medium, or low was used.

- High priorities are associated with actions for hazards that impact the community on an annual or near annual basis and generate impacts to critical facilities and/or people.
- Medium priorities are associated with actions for hazards that impact the community less frequently, and do not typically generate impacts to critical facilities and/or people.
- Low priorities are associated with actions for hazards that rarely impact the community and have rarely generated documented impacts to critical facilities and/or people.

Prioritizing the mitigation actions within the MAP matrix (Table 7-8) was completed to provide the City with an implementation approach.

7.5 MITIGATION ACTION PLAN

Table 7-7 delineates the acronyms used in the MAP (Table 7-8). See Appendix A for summarized agency funding source descriptions.

Table 7-7 Potential Funding Source Acronym List

City of Eagle (City)

Eagle Village Tribal Council (Village)

Assistance to Native Americans (ANA)
Native American Housing Assistance and Self Determination Act (NAFSMA),

Bureau of Indian Affairs (BIA)
Housing Improvement Program (HIP)

Federal Management Agency (FEMA) /
Hazard Mitigation Assistance (HMA) Grant Programs,
Emergency Management Program Grant (EMPG)
Debris Management Grant
Flood Mitigation Assistance Grants
National Earthquake Hazards Reduction Program (NEHRP)
National Dam Safety Program (NDS)
Disaster related Pubic Assistance (PA)

US Department of Homeland Security (DHS)
Citizens Corp Program (CCP)
Emergency Operations Center (EOC)
Homeland Security Grant Program (HSGP)
Emergency Management Performance Grant (EMPG)
State Homeland Security Program (SHSP)

US Department of Commerce (DOC) /
Remote Community Alert Systems Program (RCASP)
National Oceanic and Atmospheric Administration (NOAA)

Denali Commission (Denali)
Energy Program,
Solid Waste Program

Alaska Department of Military and Veterans Affairs (DMVA),
Division of Homeland Security and Emergency Management (DHSEM)
Mitigation Section (for PDM & HMGP projects and plan development)
Preparedness Section (for community planning)
State Emergency Operations Center (SEOC for emergency response)

Alaska Department of Community, Commerce, and Economic Development (DCCED)
Division of Community and Regional Affairs (DCRA) /
Community Development Block Grant (CDBG)
Alaska Climate Change Impact Mitigation Program (ACCIMP)
Flood Mitigation Assistance Grants (FMA)

Alaska Department of Transportation
State Road Repair Funding

Alaska Energy Authority (AEA)
AEA/Bulk Fuel (ABF)
Alternative Energy and Energy Efficiency (AEEE)

Alaska Department of Environmental Conservation (DEC) /
Village Safe Water (VSW),
Alaska Drinking Water Fund (ADWF),
Alaska Clean Water Fund [ACWF],
Clean Water State Revolving Fund (CWSRF)

Table 7-7 Potential Funding Source Acronym List

US Army Corp of Engineers (USACE) /
Planning Assistance
Capital Projects: Erosion, Flood, Ports & Harbors

Alaska Division of Forestry (DOF) /
Volunteer Fire Assistance and Rural Fire Assistance Grant (VFAG/RFAG),
Assistance to Firefighters Grant (AFG),
Fire Prevention and Safety (FP&S),
Staffing for Adequate Fire and Emergency Response Grants (SAFER)
Emergency Food and Shelter (EF&S)

US Department of Agriculture (USDA) /
Emergency Watershed Protection Program (EWP])
Emergency Conservation Fund (ECF),
Rural Development (RD)

US Geological Survey (USGS)
Alaska Volcano Observatory (AVO)

Natural Resources Conservation Service (NRCS) /
Emergency Watershed Protection Program (EWP)
Wildlife Habitat Incentives Program (WHIP)
Watershed Planning

US Army Corps of Engineers (USACE) /
Planning Assistance Program
Capital Projects: Erosion, Flood, Ports & Harbors

Bering Straits Regional Housing Authority (BSRHA)

University of Alaska Fairbanks
Cold Climate Housing and Research Center (CCHRC)
Sustainable Northern Communities (SNC)

Lindbergh Foundation Grant Programs (LFGP)

Rasmuson Foundation Grants (LFG)

The MAP, Table 7-8, depicts how each mitigation action will be implemented and administered by the City and the Native Village respectively. The MAP delineates each selected mitigation action, its priorities, responsible entity, potential funding resources, anticipated implementation timeline, and provides a brief explanation as to how the overall benefit/costs and technical feasibility were taken into consideration.

Table 7-8 Combined City and Native Village of Eagle's Mitigation Action Plan (MAP)

(See acronym and abbreviations list for complete titles)

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Entity	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
MH 1.1	Identify and pursue funding opportunities to implement mitigation actions.	High	City of Eagle (City), Native Village of Eagle (Tribe) The Native Council is included as a viable responsible entity in order to obtain Administration for Native Americans (ANA) funding, the Tribe would need to be the applicant for those projects	City, Tribe	Ongoing	B/C: This ongoing activity is essential for the City as there are limited funds available to accomplish effective mitigation actions. T/F: This activity is ongoing demonstrating its feasibility.
MH 1.2	Hold an annual or biennial "hazard meeting" to provide information to residents about recognition and mitigation of all natural hazards that affect the Eagle area.	Medium	Tribe	Tribe, FEMA HMA, AFG, FP&S, SAFER, ANA, EEFSP, Lindbergh, Rasmuson, Denali Commission	Ongoing	B/C: Sustained mitigation outreach program has minimal cost and will help build and support area-wide capacity. This type activity enables the public to prepare for, respond to, and recover from disasters. T/F: This low cost activity can be combined with recurring community meetings where hazard specific information can be presented in small increments. This activity is ongoing demonstrating its feasibility.
MH 1.3	Establish a formal role for the Hazard Mitigation Planning	Medium	City	City	1-3 years	B/C: The existing team has gained

Table 7-8 Combined City and Native Village of Eagle's Mitigation Action Plan (MAP)

(See acronym and abbreviations list for complete titles)

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Entity	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
	Team to develop a sustainable process to implement, monitor, review, and evaluate community wide mitigation actions.					experienced throughout this process which can provide invaluable insight for ensuring a sustained effort toward mitigating natural hazard damages. T/F: This is feasible to accomplish as no cost is associated with the action and only relies on member availability and willingness to serve their community.
MH 1.4	Develop, produce, and distribute information materials concerning mitigation, preparedness, and safety procedures for all identified natural hazards.	Medium	City	City, HMA programs, DOF	1-3 years	B/C: FEMA provides free publications for community education purposes. T/F: Low to no cost makes this a very feasible project to successfully educate large populations.
MH 1.5	Disseminate FEMA pamphlets to educate and encourage homeowners concerning structural and non-structural retrofit benefits.	Low	City, Tribe	City, Tribe, FEMA HMA programs, AFG, FP&S, and SAFER	1-3 years	B/C: Sustained mitigation outreach programs have minimal cost and will help build and support area-wide capacity. This type activity enables the public to prepare for, respond to, and recover from disasters. T/F: This low cost activity can be combined with recurring community meetings where hazard specific information can be presented in small increments. This activity is ongoing demonstrating its feasibility.
MH 1.6	Develop outreach program to educate residents concerning	Medium	City	City, Denali Commission, DCRA	2-4 years	B/C: Sustained mitigation outreach

Table 7-8 Combined City and Native Village of Eagle's Mitigation Action Plan (MAP)

(See acronym and abbreviations list for complete titles)

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Entity	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
	flood proofed wells, sewer/septic or other non-residential facilities.			HMA programs,		programs have minimal cost and will help build and support area-wide capacity. This type activity enables the public to prepare for, respond to, and recover from disasters. T/F: This low cost activity can be combined with recurring community meetings where hazard specific information can be presented in small increments. This activity is ongoing demonstrating its feasibility.
MH 1.7	Identify critical facilities and vulnerable populations based on identified (and mapped where applicable) high hazard areas.	Medium	City	City, Denali Commission, DCRA, DHS	Ongoing	B/C: This project will ensure the community looks closely at their hazard areas to ensure they can take strides to protect their residents and visitors from natural hazard event impacts. T/F: This is technically feasible using existing city and tribal resources.
MH 1.8	Identify evacuation routes away from high hazard areas and develop outreach program to educate the public concerning warnings and evacuation procedures.	Low	City, Tribe	City, Tribe, Denali Commission, DCRA, DOF	City: Ongoing Tribe: Ongoing	B/C: This project will ensure the community looks closely at their hazard areas to ensure they can safely evacuate their residents and visitors to safety during a natural hazard event. T/F: This is technically feasible using existing city and tribal resources.
MH 1.9		Medium	City	City, Tribe, DOF, DHS, DOC/RCASP,	Ongoing	B/C: Sustained emergency response

Table 7-8 Combined City and Native Village of Eagle's Mitigation Action Plan (MAP)

(See acronym and abbreviations list for complete titles)

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Entity	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
				Denali Commission		planning and response capability programs will provide community capacity. This activity will enable the public to prepare for and respond to local disasters. T/F: This project is technically feasible using existing City staff with funding assistance from outside agency programs.
MH 2.1	The City and Village will strive to manage their existing plans to ensure they incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, and land use plans, etc. to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.	Medium	City, Tribe	City, Tribe, Denali Commission, DCRA	1-3 years	B/C: Coordinated planning ensures effective damage abatement and ensures proper attention is assigned to reduce losses and damage to structures and residents. T/F: This is feasible to accomplish as cost can be associated with plan reviews and updates. The action relies on staff and review committee availability and willingness to serve their community.
MH 2.2	Integrate the Mitigation Plan hazard analysis findings for enhanced emergency planning.	Medium	City	City, Denali Commission, DCCED/CDBG	1-3 years	B/C: Coordinated planning ensures effective damage abatement and ensures proper attention is assigned to reduce losses and damage to structures and City residents. T/F: This is feasible to accomplish as no cost is associated with the action and only relies on member

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						availability and willingness to serve their community.
MH 2.3	Prohibit new construction in identified mitigatable hazard impact areas (avalanche, flood, erosion, etc.) or require building to applicable building codes for other hazard impacts (earthquake, volcanic ash, weather, etc.).	High	City, Tribe	City, Tribe, HMA, ANA, DEC/ CWSRF	City: 1-4 years Tribe: Ongoing	B/C: Stormwater Management plans are an essential disaster management tool. Focused and coordinated planning enables effective damage abatement and ensures proper attention is assigned to reduce losses, damage, and materials management. T/F: This action is feasible with limited fund expenditures.
MH 2.4	Identify and list repetitively damaged structures and infrastructure, analyze the threat to these facilities, and raise mitigation action priorities to protect the threatened population.	Medium	City	City, Denali Commission, DCRA	1-3 years	B/C: Repetitive damage reduction is a high priority for FEMA and will therefore benefit the community greatly. Identifying RL and SRL properties is the first step to reducing losses. Coordinated planning ensures effective damage abatement and ensures proper attention is assigned to reduce losses and damage to structures and City residents. T/F: This is feasible to accomplish as no cost is associated with the action until appropriate mitigation actions are identified. This activity relies on community member availability and

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(See acronym and abbreviations list for complete titles)

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Entity	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
						willingness to serve their community.
MH 3.1	Acquire (buy-out), demolish, or relocate structures from hazard prone area (erosion, flood, ground failure, etc.) Property deeds "must be" restricted for open space uses for perpetuity to keep people from rebuilding in known hazard areas.	High	City Tribe	City, Tribe, HMA, NRCS, ANA, USACE, USDA, Lindbergh	City: Ongoing Tribe: 1-5 years	B/C: This project would remove threatened structures from hazard areas, eliminating future damage while keeping land clear for perpetuity. F: This project is feasible using existing staff skills, equipment, and materials. Acquiring contractor expertise may be required for large facilities.
MH 3.2	Encourage utility companies to evaluate and harden vulnerable infrastructure elements for sustainability.	Medium	City	City, HMA, AFG, FP&S, SAFER, ANA, EFSP	3-5 years	B/C: This project would ensure threatened infrastructures are available for use – their loss would exacerbate potential damages and further threaten survivability. F: This project is feasible using existing staff skills, equipment, and materials.
ER 5.1	Pursue opportunities to protect the City's eroding embankment by identifying and implementing more viable mitigation initiatives such as better designed: Rip-rap (large rocks), sheet pilings, gabion baskets, articulated matting, concrete, asphalt, vegetation, or other armoring or	High	City, Tribe	City, Tribe, HMA programs, ANA, NRCS, USACE	City: Ongoing Tribe: 3-5 years	B/C: Improving embankment and slope stability will greatly reduce potential infrastructure and residential losses. Project costs would outweigh replacement costs of lost facilities. T/F: The community has the skill to implement this action. Specialized skills may need to be contracted-out

Table 7-8 Combined City and Native Village of Eagle's Mitigation Action Plan (MAP)

(See acronym and abbreviations list for complete titles)

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Entity	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
	protective materials to provide Kinia River bank protection.					with materials and equipment barged in depending on the method selected.
ER 5.2	Harden culvert entrance bottoms with asphalt, concrete, rock, or similar material to reduce erosion or scour.	High	City	City, HMA programs, NRCS, Denali Commission, DCRA	Ongoing	B/C: This retrofit project can be a very cost effective method for bush communities as materials and shipping costs are very high. This project is technically feasible as the community need only demonstrate cost savings by demonstrating losses from history utility impacts and down time.
FL 6.1	Determine and implement most cost beneficial and feasible mitigation actions for locations with repetitive flooding, significant historical damages, or road closures.	High	City	City, HMA, NRCS, USACE, USDA, DCRA	1-3 years	B/C: Flood hazard mitigation is among FEMA's highest national priorities. FEMA desires communities focus on repetitive flood loss properties. This activity will ensure the City and Tribal Councils focus on priority flood locations and projects. T/F: Low to no cost makes this outreach activity very feasible.
FL 6.2	Increase culvert sizes to increase their drainage capacity or efficiency.	High	City: DOT Tribe: BIA	City, Tribe, HMA, ANA, Denali Commission, NRCS, USACE, USDA, DCRA, DOT, BIA	Ongoing	B/C: Improving water flow capability will greatly reduce potential infrastructure and residential losses. Project costs would outweigh replacement costs of lost facilities. T/F: The community has the skill to implement this action. Specialized

Table 7-8 Combined City and Native Village of Eagle's Mitigation Action Plan (MAP)

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Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Entity	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
						skills may need to be contracted-out with materials and equipment barged in depending on the method selected.
FL 6.3	Construct water treatment system to improve water quality over existing community well structure which continually gets contaminated from Ice Jam Flood events	High	City	City, DEC, ANTHC, ANA, Denali Commission, NRCS, USACE, USDA, DCRA	2-4 years	B/C: Improving water quality and flow capability will greatly reduce potential infrastructure and residential losses. Project costs would outweigh replacement costs of lost facilities. T/F: The community has the skill to implement this action. Specialized skills may need to be contracted-out with materials and equipment barged in depending on the method selected.
FL 6.4	Evaluate and modify Village Watering Point to provide residents a viable community watering source. Residents currently haul water from the City of Eagle's well.	High	Tribe	Tribe, DEC, ANTHC, ANA, Denali Commission, NRCS, USACE, USDA/EWP, USDA/ECP, DCRA/ ACCIMP	2-4 years	B/C: Improving water, availability, quality, and flow capability will greatly reduce potential infrastructure and residential losses. Project costs would outweigh replacement costs of lost facilities. T/F: The community has the skill to implement this action. Specialized skills may need to be contracted-out with materials and equipment barged in depending on the method selected.

Table 7-8 Combined City and Native Village of Eagle's Mitigation Action Plan (MAP)

(See acronym and abbreviations list for complete titles)

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Entity	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
GF 7.1	Promote ground failure (such as permafrost) sensitive construction practices in hazard impact areas.	Medium	Tribe	Tribe, HMA, ANA	2-4 years	B/C: This outreach project would decrease damage to facilities if they were sited and used the most appropriate construction practices. T/F: Technically feasible as the community is currently working with UAF and other entities to determine most viable permafrost construction practices.
SW 8.1	Develop and implement tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events.	Low	Tribe	Tribe, DOF	3-5 years	B/C: Implementing this mitigation activity will potentially reduce ancillary damage from severe winter storms caused by heavy snow loads, icy rain, and wind. T/F: This type activity is technically feasible within the community typically using existing labor, equipment, and materials.
WF 9.1	Hold FireWise workshop to educate residents and contractors concerning fire resistant landscaping.	Medium	City	City, AFG, FP&S	1-3 Years	B/C: Sustained mitigation outreach programs have minimal cost and will help build and support community capacity enabling the public to appropriately prepare for, respond to, and recover from disasters. T/F: This project is technically feasible using existing City and Tribal staff.

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Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Entity	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
WF 9.2	Promote FireWise building siting, design, and construction processes and materials.	Medium	City	City, Tribe, AFG, FP&S	1-3 Years	B/C: Sustained mitigation outreach programs have minimal cost and will help build and support community capacity enabling the public to appropriately prepare for, respond to, and recover from disasters. T/F: This project is technically feasible using existing City and Tribal staff.
WF 9.3	Provide wildland fire hazard outreach information in an easily distributed format for all residents.	Medium	City, Tribe	City, Tribe, DOF FireWise Program	1-3 years	B/C: Sustained mitigation outreach program has minimal cost and will help build and support area-wide capacity. This type activity enables the public to prepare for, respond to, and recover from disasters. T/F: This low cost activity can be combined with recurring community meetings where hazard specific information can be presented in small increments. This activity is ongoing demonstrating its feasibility.
WF 9.4	Develop, adopt, and enforce burn ordinances that controls outdoor burning, require burn permits, and restricts open campfires during identified weather periods (windy, dry, etc.).	Medium	City	City, DOF, DCRA	1-5 years	B/C: Ordinance development, implementation, and enforcement can effectively reduce future losses to hazardous events. T/F: This project is technically feasible and enforceable.

Table 7-8 Combined City and Native Village of Eagle's Mitigation Action Plan (MAP)

(See acronym and abbreviations list for complete titles)

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Entity	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
WF 9.5	Develop outreach program to educate and encourage fire-safe construction practices for existing and new construction in high-risk areas.	Medium	City	City, Tribe, DOF FireWise Program	1-3 years	B/C: Sustained mitigation outreach program has minimal cost and will help build and support area-wide capacity. This type activity enables the public to prepare for, respond to, and recover from disasters. T/F: This low cost activity can be combined with recurring community meetings where hazard specific information can be presented in small increments. This activity is ongoing demonstrating its feasibility.
WF 9.7	Identify, develop, implement, and enforce mitigation actions and protective measures for fuel breaks and wildland fire fuels reduction zones to assure sustainability.	Medium	City, Tribe	City, Tribe, AFG, FP&S, SAFER	1-3 years	B/C: This sustainable mitigation activity will greatly reduce the wildland/urban interface, have minimal cost, and will help build and support community capacity to respond to wildland fire disasters. T/F: This project is technically feasible using existing Tribal Council staff.

7.6 IMPLEMENTING MITIGATION STRATEGY INTO EXISTING PLANNING MECHANISMS

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

DMA 2000 Requirements
Incorporation into Existing Planning Mechanisms §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.
ELEMENT C. Incorporate into Other Planning Mechanisms
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?
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.

- Review the community-specific regulatory tools to determine where to integrate the mitigation philosophy and implementable initiatives. These regulatory tools are identified in Section 7.1 capability assessment.
- Work with pertinent community departments to increase awareness for implementing HMP philosophies and identified initiatives. Provide assistance with integrating the mitigation strategy (including the Mitigation Action Plan) into relevant planning mechanisms (i.e. Comprehensive Plan, Capital Improvement Project List, Transportation Improvement Plan, etc.).
- Implementing this philosophy and activities may require updating or amending specific planning mechanisms.

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REFERENCES

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Appendix A
Funding Resources

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Federal Funding 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).
    - Post-Disaster Hazard Mitigation Planning Guidance for State and Local Governments. FEMA DAP-12, September 1990. This handbook explains the basic concepts of hazard mitigation and shows state and local governments how they can develop and achieve mitigation goals within the context of FEMA's post-disaster hazard mitigation planning requirements. The handbook focuses on approaches to mitigation, with an emphasis on multi-objective planning.
    - 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.
    - Hazard Mitigation Assistance (HMA Unified Guidance, June 1, 2010. 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).

- Public Assistance Guide, FEMA 322, July 2007. The mission of the FEMA Public Assistance (PA) Grant Program is to provide assistance to State, Tribal and local governments, and certain types of Private Nonprofit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President.

  The PA Program provides supplemental Federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain Private Non-Profit (PNP) organizations. The PA Program also encourages protection of these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process. (http://www.fema.gov/public-assistance-policy-and-guidance/public-assistance-guide)
- Debris Management Guide FEMA 325, July 2007. FEMA encourages State and local governments, tribal authorities, and private non-profit organizations to take a proactive approach to coordinating and managing debris removal operations as part of their overall emergency management plan. Communities with a debris management plan are better prepared to restore public services and ensure the public health and safety in the aftermath of a disaster, and they are better positioned to receive the full level of assistance available to them from FEMA and other participating entities.

  The core components of a comprehensive debris management plan incorporate best practices in debris removal, reflect FEMA eligibility criteria, and are tailored to the specific needs and unique circumstances of each applicant. FEMA developed this guide to provide applicants with a programmatic and operational framework for structuring their own debris management plan or ensuring that their existing plan is consistent with FEMA's eligibility criteria. (http://www.fema.gov/pdf/government/grant/pa/demagde.pdf)

- FEMA also administers emergency management grants (http://www.fema.gov/help/site.shtm) and various firefighter grant programs (http://www.firegrantsupport.com/) such as
  - 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 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 (DHS) provides the following grants:
  - Homeland Security Grant Program (HSGP), State Homeland Security Program (SHSP) are 80% pass through grants. SHSP supports implementing the State Homeland Security Strategies to address identified planning, organization, equipment, training, and exercise needs for acts of terrorism and other catastrophic events. In addition, SHSP supports implementing the National Preparedness Guidelines, the NIMS, and the National Response Framework (NRF). Must ensure at least 25% of funds are dedicated towards law enforcement terrorism prevention-oriented activities.
  - Citizen Corps Program (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 Emergency Operations Centers (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 provided includes: 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) 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 (IHLGP). 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 (DOT), Hazardous Materials Emergency Preparedness Grant. DOT increases State, Territorial, Tribal and local effectiveness in safely and efficiently handling hazardous materials accidents and incidents, enhances implementation of the Emergency Planning and Community Right-to-Know Act of 1986, and encourages 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. Further information is located at: 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 provides information concerning disaster assistance, preparedness, planning, cleanup, and recovery planning. (http://www.sba.gov/category/navigation-structure/starting-managing-business/managing-business/running-business/emergency-preparedness-and-disaster-)
    - 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.
- United States Army Corps of Engineers (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.
- Grants.gov. was established as a governmental resource named the E-Grants Initiative, part of the President's 2002 Fiscal Year Management Agenda to improve government services to the public. The concept has its origins in the Federal Financial Assistance

Management Improvement Act of 1999, also known as Public Law 106-107. The Grants Policy Committee (GPC), a committee of the U.S. Chief Financial Officers (CFO) Council consisting of grants policy experts from across the federal government assumed responsibility for implementing P.L. 106-107, working to enhance federal financial assistance even after P.L. 106-107 expired in November 2007. The Council on Financial Assistance Reform (COFAR), created in October 2011, continues to assist the Federal financial assistance community with delivery, management, coordination, and accountability of Federal grants and cooperative agreements.

Today, www.Grants.gov is a central storehouse for information on over 1,000 grant programs and provides access to approximately $500 billion in annual awards.

State Funding Resources

- 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)
    - DHS&EM within DMVA 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://ready.alaska.gov/plans/mitigation.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/)
- DCRA within the DCCED 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 division also administers programs for State's" distressed" and "targeted" communities. (http://www.commerce.state.ak.us/dca/)
    - DCRA Planning and Land Management staff provide Alaska Climate Change Impact Mitigation Program (ACCIMP) funding to Alaskan communities that meet one or more of the following criteria related to flooding, erosion, melting permafrost, or other climate change-related phenomena: Life/safety risk during storm/flood events; loss of critical infrastructure; public health threats; and loss of 10% of residential dwellings.

      The Hazard Impact Assessment is the first step in the ACCIMP process. The HIA identifies and defines the climate change-related hazards in the community,

establishes current and predicted impacts, and provides recommendations to the community on alternatives to mitigate the impact. The community may then pursue these recommendations through an ACCIMP Community Planning Grant. (http://commerce.alaska.gov/dca/planning/accimp/hazard_impact.html)

- Department of Environmental Conservation (DEC). DEC's primary roles and responsibilities concerning hazards mitigation are ensuring safe food and safe water, and pollution prevention and pollution response. DEC ensures water treatment plants, landfills, and bulk fuel storage tank farms are safely constructed and operated in communities. Agency and facility response plans include hazards identification and pollution prevention and response strategies. (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 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.

- Rural Alaska Community Action Program Inc. (RurAL CAP) In the nearly 50 years since it began, it is difficult to imagine any aspect of rural Alaskan lives which has not been touched in some way by the people and programs of RurAL CAP. From Head Start, parent education, adult basic education, and elder-youth programs, to Native land claims and subsistence rights, energy and weatherization programs, and alcohol and substance abuse prevention, RurAL CAP has left a lasting mark on the history and development of Alaska and its rural Peoples. (http://ruralcap.com/?page_id=334)

  From its earliest days to the present, RurAL CAP's success can be attributed to the direct involvement of rural Alaskans in its programs and in the decision making processes which affect their lives, and to the belief in and respect for those Peoples by the board and staff of RurAL CAP.

  - Weatherization Assistance Program assists low to moderate income households in weatherization needs. The program is available to homeowners as well as renters and includes; single family homes, cabins, mobile homes, condominiums and multifamily dwellings.

    Services *may* include improvements such as; air sealing, caulking and insulation, doors and windows, exterior paint, heating system test and tune, ventilation and moisture control. Major home repairs are not classified under weatherization and thus are not eligible under the program. (http://www.weatherizeme.org/Applications/RUR/Wx%20app%20Rural%2004-13.pdf)

  - Energy Programs. VISTA Energy Program (VEP) Members work on projects like energy efficiency education, planning and capacity building for renewable energy options, and home energy efficiency education. VEP helps rural Alaskan communities reduce their energy bills.

    VEP Members build partnerships, developed funding proposals, and worked with their sponsoring council to raise money and in-kind resources for energy projects in their communities.

  - Environment. RurAL CAP has several interwoven projects under the Environmental Program. All of these projects were created to respond to the needs rural Alaskans reported in community assessments conducted by AmeriCorps members. All of these interconnected projects address local environmental issues with local solutions, connect rural Alaskans to each other to share resources, and are connected to the RAVEN AmeriCorps program.

    RurAL CAP's environmental programs surround issues of solid waste, backhaul efforts, the RAVEN AmeriCorps program, subsistence and indoor air quality. The programs include the Denali Solid Waste Grants, EPA Community Environmental Demonstration Projects, Solid Waste Management Technical Assistance, RAVEN AmeriCorps Members, Subsistence in Alaska, and Alaska Village Indoor Air Quality.

  - Solid Waste Management. RurAL CAP continues to host an expert solid waste liaison, Ted Jacobson, through funding provided by the Environmental Protection Agency (EPA) and Senior Services America, Inc. The liaison provides solid waste management technical assistance to rural communities through training, site visits,

hands-on demonstrations, and remote contact. Resources are provided for dump management activities, collaborating with funders for funding and technical assistance on solid waste management, recycling, and backhaul.

- American Planning Association (APA), http://www.planning.org - a non-profit professional association that serves as a resource for planners, elected officials, and citizens concerned with planning and growth initiatives.
- Institute for Business and Home Safety (IBHS), http://ibhs.org - an initiative of the insurance industry to reduce deaths, injuries, property damage, economic losses, and human suffering caused by natural disasters.
- American Red Cross (ARC). Provides for the critical needs of individuals such as food, clothing, shelter, and supplemental medical needs. Provides recovery needs such as furniture, home repair, home purchasing, essential tools, and some bill payment may be provided.
- Crisis Counseling Program. Provides grants to State and Borough Mental Health Departments, which in turn provide training for screening, diagnosing and counseling techniques. Also provides funds for counseling, outreach, and consultation for those affected by disaster. (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.
- University of Alaska Fairbanks, Cold Climate Housing and Research Center (CCHRC). The Sustainable Northern Shelter program was initiated in 2008 to address the need for sustainable rural housing in northern climates. CCHRC designers work with local residents and housing authorities to develop homes that reflect the culture, environment, and local resources of individual communities. The designs emphasize energy efficiency, affordability, and durability.

- CCHRC has developed several prototype homes that can be easily and affordably reproduced throughout communities to provide much-needed housing. The program, which started with an experimental house made out of spray foam in Anaktuvuk Pass, has grown to encompass more than a dozen villages throughout Alaska. (http://www.cchrc.org/sustainable-northern-communities).

- 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 Lindberghs' 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.

  Rasmuson Foundation awards grants both to organizations serving Alaskans through a base of operations in Alaska, and to individuals for projects, fellowships and sabbaticals. To be considered for a grant award, grant seekers must meet specific criteria and complete and submit the required application according to the specific guidelines of each program. (http://www.rasmuson.org/index.php?switch=viewpage&pageid=5)

  - Tier 1 Awards: Grants of up to $25,000 for capital projects, technology updates, capacity building, program expansion, and creative works.
  - Tier 2 Awards: Grants over $25,000 for projects of demonstrable strategic importance or innovative nature.
  - Pre-Development Program: Guidance and technical resources for planning new, sustainable capital projects.

  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)

Appendix B

FEMA Hazard Mitigation Plan (HMP) Review Tool

To be FEMA provided and inserted after Final Review and Approval.

APPENDIX A:
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 Eagle	**Title of Plan:** City of Eagle Hazard Mitigation Plan	**Date of Plan:** February 2014
Local Point of Contact: Donald Woodruff	**Address:** P.O. Box 1901 Eagle, AK 99736	
Title: Mayor		
Agency: City of Eagle		
Phone Number: 907.547.2282	**E-Mail:** eaglety@aptalaska.net	

State Reviewer: Scott Nelsen	**Title:** Mitigation Planner	**Date:** 9 May 2014

FEMA Reviewer: Brett Holt	**Title:** Mitigation Planner	**Date:** June 24, 2014
Date Received in FEMA Region 10	May 12, 2014	
Plan Not Approved		
Plan Approvable Pending Adoption	June 25, 2014	
Plan Approved	October 14, 2014	

SECTION 1:
REGULATION CHECKLIST

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been 'Met' or 'Not Met.' The 'Required Revisions' summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is 'Not Met.' Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, 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 3.1, Page 3-1 Section 3.2, Page 3-2	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 3.3, Page 3-3	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 3.3, Page 3-3	X	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Section 3.4, Page 3-5 Section 3.5.1 Page 3-6, p. 8-1	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 3.5.2, Page 3-6	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 3.5.3,Page 3-7	X	
ELEMENT A: 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 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, Page 5-1 Table 5-1, Page 5-2 ***Earthquake*** Section 5.3.1., Page 5-5 ***Erosion***, Section 5.3.2, Page 5-10 ***Flood***, Section 5.3.3, Page 5-15 ***Ground Failure***, Section 5.3.4, Page 5-23 ***Weather (Severe)*** Section 5.3.5, Page 5-28 ***Wildland Fire***, Section 5.3.6, Page 5-36	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))	***Earthquake***, Section 5.3.1.2 History, Page 5-6 Section 5.3.1.3 Probability, Page 5-9 ***Erosion***, Sec. 5.3.2.2, History, Page 5-10 Section 5.3.2.3 Probability, Page. 5-15 ***Flood***, Section 5.3.3.2 History, Page 5-16 Section 5.3.3.3 Probability, Page 5-23 ***Ground Failure***, Section 5.3.4.2 History, Page 5-25 Section 5.3.4.3 Probability, Page 5-28 ***Weather (Severe)*** Section 5.3.5.2 History, Page 5-30 Section 5.3.5.3 Probability, Page 5-36 ***Wildland Fire***, Section 5.3.6.2 History Page 5-37 Section 5.3.6.3 Probability, Page 5-41	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))	***Earthquake***, Section 5.3.1.3 Extent, Page 5-8 Impact, Page 5-8 ***Erosion***, Section 5.3.2.3 Extent, Page 5-12 Impact, Page 5-15 ***Flood***, Section 5.3.3.3 Extent, Page 5-22 Impact, Page 5-22 ***Ground Failure***, Section 5.3.4.3 Extent, Page 5-27 Impact, Page 5-28 ***Weather (Severe)*** Section 5.3.5.3 Extent, Page 5-35 Impact, Page 5-36 ***Wildland Fire***, Section 5.3.6.3 Extent Page 5-40 Impact, Page 5-41 **Vulnerability Analysis Overview** Chapter 6, Page 6-1 through Page 6-22	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 1.2.1 Page 1-3 Section 6.4.1.1, Page 6-12	X	
ELEMENT B: REQUIRED REVISIONS			
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 7.1, Page 7-2 Tables 7-1, 7-2, 7-3, Pages 7-2 through Page 7-4	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 1.2.1 Page 1-2 Section 6.4.1.1, Page 6-12	X	
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section 7.2, Page 7-4 Table 7-4, Page 7-5	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 7.3, Page 7-5 Table 7-5, Page 7-6 through Page 7-11	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))	Table 7-5, Page 7-6 Section 7.4, Page 7-9 Section 7.5, Mitigation Action Plan, Page 7-12 Tables 7-7, 7-8, Page 7-13 through Page 7-24	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 7.6 Page 7-25 Table 7-8	X	
ELEMENT C: 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 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))	N/A		
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	N/A		
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	N/A		
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 4.1, Page 4-1	X	
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 **E1: Eagle will adopt their plan after FEMA pre-approval (APA).**			
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 includes a summary of the five steps taken during the planning process as well as a memo summarizing the project kickoff meeting that was held.
- The public involvement initiatives included faxing and emailing two newsletters to a diverse group of relevant academia, nonprofits, and local, state, and federal agencies announcing upcoming planning activities and requesting input on identifying hazards and critical facilities as well as comments on the draft plan which was made available in the Tribal office.
- The plan includes a summary of how information from various documents that were reviewed for incorporation in the plan will improve mitigation planning. The plan also uses citations to further document how the relevant information from other resources was incorporated into the plan.
- The plan includes copies of the plan maintenance documents that will be used during the monitoring, reviewing, evaluating, and updating of the plan, including an annual review questionnaire and mitigation action progress report.

Opportunities for Improvement:

- Further document the planning process by including meeting minutes, agendas, and sign-in sheets.
- In addition to distributing newsletters and making copies of the draft plan available for review and comment, consider using more diverse methods of participation, such as surveys, questionnaires, and workshops to solicit public feedback.
- Include a summary of any public comments on hazard identification, critical facilities, or the overall draft plan that were received.

Element B: Hazard Identification and Risk Assessment

Plan Strengths:

- The plan includes a community profile that provides a description of the location, geography, history, demographics, and economy of the Village as well as a summary of the local land use and development trends.
- The plan includes a table that identifies which hazards pose the greatest threat to the Village and should be further analyzed. Hazard profiles describe the nature, history, location, extent, impact, and future event probability for each of the identified hazards.

- The plan clearly defines the descriptors that are used for hazard probability and extent (magnitude/severity).
- A detailed vulnerability exposure analysis was used to determine the number of people and the number and value of residences, critical facilities, and critical infrastructure exposed to each of the identified hazards based on a worst-case scenario. The plan describes the methodology used and data limitations for the vulnerability estimates.
- The plan summarizes the Village's vulnerability to each of the hazards by determining the percent of the Village's geographic area, population, building stock, and critical facilities and utilities that are vulnerable to each of the identified hazards.

Opportunities for Improvement:

- Consider expanding the vulnerability assessment to include a scenario-based analysis that estimates potential losses resulting from various hazard events (e.g., 100- and 500-year flood events or MMI 5.0 and 7.0 earthquakes).

Element C: Mitigation Strategy

Plan Strengths:

- The plan includes a capability assessment that outlines the Village's regulatory tools, technical specialists, and financial resources available for hazard mitigation. Appendix A also identifies additional Federal and state funding resources available.
- The exposure analysis results were used as the basis for developing the mitigation goals and actions.
- The plan includes a list of the mitigation actions that were considered as well as those actions that were selected for implementation. This list includes a comprehensive range of actions, including prevention, property protection, natural resource protection, structural projects, and education and awareness.
- The plan links the mitigation strategy to the hazard identification and vulnerability assessment by identifying hazard-specific goals. The plan also links each mitigation action to the hazard it will mitigate.
- The Hazard Mitigation Team prioritized 29 mitigation actions that were chosen to carry forward into the Mitigation Action Plan after considering each hazard's history, extent, and probability as well as the overall benefit/costs and technical feasibility.
- The Mitigation Action Plan Matrix identifies the priority, responsible entity, potential funding sources, timeframe, benefit/costs, and technical feasibility for each selected mitigation action.
- The Planning Team members will review the regulatory tools identified in the capability assessment to determine where to integrate the mitigation philosophy and implementation initiatives. They will also provide assistance integrating the mitigation strategy into relevant planning mechanisms (i.e., community, land use, capital improvement, transportation improvement, sanitation plans, etc.).

Opportunities for Improvement:

- Make additional linkages between the vulnerability assessment, hazard risk, and mitigation strategy. For example, target mitigation actions at specific locations/areas that have been identified as vulnerable to a hazard.
- Consider estimating the cost of implementation for the actions included in the Mitigation Action Plan.
- When listing financial resources, consider State financial resources as identified in the State Hazard Mitigation Plan.

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

Plan Strengths:

- N/A

Opportunities for Improvement:

- N/A

B. Resources for Implementing Your Approved Plan

- The **Local Mitigation Plan Review Guide and Tool** resource is available through FEMA's Library and should be referred to for the next plan update. http://www.fema.gov/library/viewRecord.do?id=4859
- The **Local Mitigation Planning Handbook** is available. While the requirements under §201.6 have not changed, the *Handbook* provides guidance to local governments on developing or updating hazard mitigation plans to meet the requirements and is available through the FEMA Library website. http://www.fema.gov/library/viewRecord.do?id=7209

- The **Mitigation Ideas: A Resource for Reducing Risk from Natural Hazards** resource presents ideas for how to mitigate the impacts of different natural hazards, from drought and sea level rise, to severe winter weather and wildfire. The document also includes ideas for actions that communities can take to reduce risk to multiple hazards, such as incorporating a hazard risk assessment into the local development review process. http://www.fema.gov/library/viewRecord.do?id=6938

- The **Integrating Hazard Mitigation into Local Planning: Case Studies and Tools for Community Officials** resource provides practice guidance on how to incorporate risk reduction strategies into existing local plans, policies, codes, and programs that guide community development or redevelopment patterns. It includes recommended steps and tools to assist with local integration efforts, along with ideas for overcoming possible impediments, and presents a series of case studies to demonstrate successful integration practice.

http://www.fema.gov/library/viewRecord.do?id=7130

- 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 newsletters, email rxnewsletter@starr-team.com.
- The mitigation strategy includes projects that are eligible for FEMA's grant programs. Contact the State Hazard Mitigation Officer, Ann Gravier at ann.gravier@alaska.gov, for application information.

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Appendix C
Community HMP Adoption Resolution

To be inserted after City adoption.

Pictured is the original Eagle City Hall, still currently in use.
Phone (907) 547-2282
Fax (907) 547-2338

Eagle is the oldest incorporated city in Interior Alaska.
(January 8, 1901)

CITY OF EAGLE ~ BOX 1901 ~ EAGLE, ALASKA 99738

RESOLUTION OF ADOPTION - #20140916-001

City of Eagle, State of Alaska, Hazard Mitigation Plan

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

WHEREAS a Hazard Mitigation Plan (the Plan) was developed through the work of Eagle's Planning Team, and interested parties within the Eagle area;

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

WHEREAS the Disaster Mitigation Act of 2000 (P.L. 106-390) (DMA 2000) and associated Federal regulations published under 44 CFR Part 201 require the City Council to formally adopt a Hazard Mitigation Plan subject to the approval of the Federal Emergency Management Agency to be eligible for federal hazard mitigation projects and activities funds;

WHEREAS the City held public meetings to receive Plan comment as required by DMA 2000;

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

1. The Plan is hereby adopted as an official plan of the City of Eagle.

2. The City's officials identified in the Planning Process (Section 3) and the Mitigation Action Plan (Section 7) are hereby directed to implement the recommended actions assigned to them. These officials will report quarterly on their activities, accomplishments, and progress to the city council.

(continued)

3. The City of Eagle's Hazard Mitigation Planning Team will provide annual progress reports on the status of the implemented Mitigation Action Plan's projects to the Planning Team Leader. The Planning Team shall submit this report to the City Council annually by the Plan's adoption anniversary date.

4. The Planning Team will complete periodic updates of the Plan as indicated in the Plan Maintenance Section (Section 3), but no less frequently than every five years.

NOW THEREFORE, BE IT RESOLVED by City Council that the City of Eagle adopts the City of Eagle's Hazard Mitigation Plan, dated April 1, 2014 as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

Passed this 16th day of September, 2014 by a roll call majority vote of the Eagle City Council.

Donald A. Woodruff, Mayor
City of Eagle

Michelle Ashley, Council Member

Darrel Christensen, Council Member

Daniel Helmer, Council Member

Joel Helmer, Council Member

Dennis Layman, Council Member

Nick Turner, Council Member

Certified:

Jean Turner
City Clerk

Seal

Appendix D
Public Outreach Activities

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Simmons, Scott

From: Simmons, Scott
Sent: Tuesday, August 06, 2013 2:24 PM
To: 'mewest@alaska.edu'; 'hdenny@anthc.org'; 'tneal@usgs.gov'; 'swhite@avcp.org'; 'steve.heppner.bia.ak@gmail.com'; 'kato_howard@ak.blm.gov'; 'jneimeyer@denali.gov'; 'leslie.pearson@alaska.gov'; 'ryan.anderson@alaska.gov'; 'Alice.Edwards@alaska.gov'; 'taunnie.boothby@alaska.gov'; 'scott.nelsen@alaska.gov'; 'alan.wien@alaska.gov'; 'terri.lomax@alaska.gov'; 'Soderlund.Dianne@epamail.epa.gov'; 'john.lingaas@noaa.gov'; 'joel.curtis@noaa.gov'; 'sam.albanese@noaa.gov'; 'meg.mueller@ak.usda.gov'; 'merlaine.kruse@ak.usda.gov'; 'greg.magee@alaska.gov'; 'Anna_Plager@dnr.state.ak.us'; 'kerry_walsh@dnr.state.ak.us'; 'John_Dunker@dnr.state.ak.us'; 'Steve_Clautice@dnr.state.ak.us'; 'patricia_burns@dnr.state.ak.us'; 'Steve_McGroarty@dnr.state.ak.us'; 'Mac_McLean@dnr.state.ak.us'; 'Margie_Goatley@dnr.state.ak.us'; 'Bruce.R.Sexauer@poa02.usace.army.mil'; 'colleen.bickford@hud.gov'; 'ak_le@fws.gov'
Cc: Dunable, Erin; DHSEM Scott Nelsen
Subject: Hazard Mitigation Plan Development Project Initial Notice

Dear Potential HMP Development Participants,

URS Corporation has received a 2013 contract from the State Division of Homeland Security and Emergency Management (DHS&EM) to develop 11 Local All-Hazard Mitigation Plans for the following communities:

- City of Brevig Mission
- City of Chefornak
- Village of Circle
- City of Eagle
- City of Eek
- City of Elim
- City of Koyuk
- City of Marshall
- City of Mountain Village
- City of Napaskiak
- City of Toksook Bay

We invite you to participate in this important community planning effort during the development process. Community newsletters will be located on the DHS&EM Local/Tribal All Hazard Mitigation Plan Development website at: http://ready.alaska.gov/plans/localhazmitplans.htm as the communities finalize them.

Please feel free to contact me and to forward this email to the most appropriate person within your agency (please cc me so I may update the contact list) involved with hazard assessments, hazard mitigation plan development or community specific hazard information or planning suggestions.

I encourage you to provide this information at your earliest convenience to allow me include it (with appropriate acknowledgments) within the Draft HMPs prior to State and FEMA review.

Kind Regards

-Scott-

R. Scott Simmons
Emergency Management | *Hazard Mitigation* | *Climate Change Adaptation Planner*

NOTE: *We have moved we now have new office address and phone numbers effective Immediately:*

3201 C Street, Suite 200 | Anchorage, AK 99503
Ph: 907.433.6711 | 800.909.6787 | Fax: 907.644.6930
eMail Address: scott.simmons@urs.com

Simmons, Scott

From: Nelsen, Scott G (MVA) <scott.nelsen@alaska.gov>
Sent: Tuesday, July 09, 2013 3:32 PM
To: Simmons, Scott
Subject: FW: Hazard Mitigation Plan

Scott, just for your SA, this is what I sent the Mayor.

From: Nelsen, Scott G (MVA)
Sent: Tuesday, July 09, 2013 3:23 PM
To: 'woodruffdon@rocketmail.com'
Subject: FW: Hazard Mitigation Plan

From: Nelsen, Scott G (MVA)
Sent: Tuesday, July 09, 2013 3:07 PM
To: 'eaglety@aptalaska.net'
Subject: Hazard Mitigation Plan

Hello Mayor Woodruff,
We are excited about helping the City of Eagle with developing a hazard Mitigation Plan. The plan is a FEMA requirement for mitigation grant funding eligibility. Currently, the State and local contractors have written 135 such plans for communities throughout Alaska. However, the last two disasters to hit your community make Eagle a very high priority for full funding eligibility.

The plan is free and will be written by the State of Alaska mitigation planning department and a local contractor, URS Inc. Your community will have full ownership and all content will be under your control. You may add anything you wish into your plan.

One last thing, the plan is non-regulatory. There are no compliance regulations and no penalties. The plan merely allows the City to tap into FEMA mitigation funds such as federal home elevation and relocation grants.

Thank you for your time

Scott Nelsen
Emergency Management Specialist
Department of Military and Veterans Affairs
Division of Homeland Security and Emergency Management
Direct: 907-428-7010
Mobile: 907-343-9915
Fax: 907-428-7009

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Memorandum

3201 C Street, Suite 200
Anchorage, AK 99503
Phone: 907.433.6711
Fax: 907.644.6930

SUBJECT: Division of Homeland Security and Emergency Management (DHS&EM) Hazard Mitigation Plan (HMP) – City of Eagle Kick-Off Meeting Minutes

Community: Eagle, AK, 907-547-2282

Date/Time: July 15, 2013

From: Erin Dunable

Attendees:

- URS: Scott Simmons and Erin Dunable
- Community Members: Mayor Donald Woodruff

Subjects covered included:

- URS was hired to develop a hazard mitigation plan based on the City's mitigatable natural hazard threats, potential impacts, population threats, and their priorities.
- It is URS' responsibility to write the plan and take on the bulk of the work to guarantee FEMA compliance, but we need several critical items that only the community can provide:
    - The attendees identified and screened hazards that impact the community and provided brief histories. Attendees also screened which hazards need to be profiled and included in the plan.
    - The Critical Facilities Inventory Spreadsheet was edited during the call, but will be forwarded to the Mayor for further editing. The list needs additional information such as facilities' physical locations (GPS coordinates and street addresses), estimated values, and estimated number of occupants to enable URS to complete a usable risk assessment and vulnerability analysis.
    - City Mayor Woodruff mentioned concerns regarding their 100 year old, hand-dug well, which has received negative tests from the DEC and all water must be boiled prior to use. He also mentioned issues with erosion and the possible need to relocate the road.
- A mitigation plan ensures community eligibility for FEMA and potentially other federal agency funding, which they are not currently eligible for... the more the information gathered, the better the plan. The HMP along prepares the community to potentially obtain funding to implement projects.
- URS explained the public meetings and newsletters provide the public opportunities to contribute to the process and let the public know where a copy of the plan is available for review, etc.

- City of Eagle Planning Team:
    - The Mayor stated that he would present to the Council to vote on project participation, Planning Team development and selection of the Planning Team Leader.
    - When asked about the participation of the Tribal Village, the Mayor provided us with the contact information for Tribal Administrator, Joyce Roberts and suggested we call her directly regarding their interest in participating. He further shared that the Tribal Village is within the fire protection zone of the City and they share the use of the well and other services such as ambulance services.

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CITY OF EAGLE AND NATIVE VILLAGE OF EAGLE
HAZARD MITIGATION PLAN DEVELOPMENT PROJECT

Newsletter #1 **November 2013**

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

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

URS was contracted to assist the community with preparing a FEMA approvable hazard mitigation plan 2013.

The Eagle Hazard Mitigation Plan will identify all natural hazards, such as earthquake, erosion, flood, severe weather, and wildland fire hazards, etc. The plan will also identify the people and facilities potentially at risk and ways to mitigate damage from future hazard impacts. The public participation and planning process is documented as part of these projects.

What is Hazard Mitigation?

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

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

Hazard mitigation projects eliminate the risk or reduce the hazard impact severity to people and property. Projects may include short- or long-term activities to reduce exposure to or the effects of known hazards. Hazard mitigation activities include relocating or elevating buildings, replacing insufficiently sized culverts, using alternative construction techniques, or developing, implementing, or enforcing building codes, and education.

Why Do We Need A Hazard Mitigation Plan?

Communities must have a State, FEMA approved, and community adopted mitigation plan to receive a project grant from FEMA's pre and post-disaster grants identified in their Hazard Mitigation Assistance and other agency's mitigation grant programs. The City of Eagle plans to apply for mitigation funds after our plan is complete.

A FEMA approved and community adopted HMP enables the Local government to apply for the Hazard Mitigation Grant Program (HMGP), a disaster related assistance program. Applicants typically compete on a statewide basis.

The Pre-Disaster Mitigation (PDM) and the National Insurance Program's Flood Mitigation Assistance (FMA), grant programs are nationally competitive funding programs. These grants use the same application process and eligibility requirements.

The Planning Process

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

The DMA2000 requires the plan to include and document the following topics:

- Plan development process
- Identify hazards specific to the community
- Identify the population's and structures' risks
- Define the jurisdiction's mitigation goals
- List the community's mitigation strategy, selected actions, and implemented projects
- Provide a copy of the community's HMP Adoption Resolution

FEMA has prepared Planning Guidance which is available at: http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&id=4859; and "How to" Guides that explain in detail how each of the DMA2000 requirements are met.

The How-To-Guides are available at: http://www.fema.gov/hazard-mitigation-planning-resources. The City's Hazard Mitigation Plan will follow those guidelines.

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

DHS&EM has previously identified natural hazards that occur in the Alaska Gateway Regional Educational Attendance Area (REAA) that may also occur specifically in Eagle.

We Need Your Help

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

Eagle Hazard Worksheet		
Hazard	Alaska Gateway REAA*	City of Eagle
Earthquake	Yes	Yes
Erosion	Yes	Yes
Flood	Yes	Yes
Ground Failure (Avalanche, landslide, permafrost, etc)	Yes	Yes
Severe Weather, (Extreme Cold, High Wind, Winter Storms, etc.)	Yes	Yes
Tsunami & Seiche	No	No
Volcano	No	No
Wildland Fire	Yes	Yes
**Hazard Matrix from the 2010 State of Alaska Hazard Mitigation Plan for the Alaska Gateway REAA.*		

DHS&EM identified critical facilities within the City of Eagle as part of the Alaska Critical Facilities Inventory, but the list of critical facilities needs to be updated and the estimated value and location (latitude/longitude) determined.

In addition, the number and value of structures, and the number of people living in each structure will need to be documented. Once this information is collected we will determine which critical facilities, residences, and populations are vulnerable to specific hazards in Eagle. Please add additional facilities if needed.

Eagle Critical Facilities*	
Facility Name	Facility Name
City office	Airport 1
Tribal Office	Airport 2
US Post Office	Service/Maintenance Shop 1
Fire Station	Service/Maintenance Shop 2
Emergency Shelter At School	Potable Water Treatment Plant?
Eagle Community School	Eagle Community School Reservoir
Eagle Clinic	BLM - West Fork Campground
Church	Eagle City Well
Church	NPS - Yukon Charley Rivers N.P.
Church	O'Brien Creek Lodge & Tavern
Church	Washeteria
Community Hall	Generation Plant
Store	Generator
Library	Fuel Storage Tanks (>500gal)
Several Museum Buildings	Landfill
Park	School Radio Transmitter
Cemetery 1	APT Telephone
Cemetery 2	
Cemetery 3	
** Alaska Critical Facilities Inventory*	

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

The Planning Team

The planning team is being led by Mayor Donald Woodruff with assistance from the City Council, Eagle Village President Ms. Joyce Roberts, and the Eagle Village Tribal Council. URS Corporation has been contracted by DHS&EM to provide assistance and guidance to the planning team throughout the planning process.

Public Participation

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

We encourage you to take an active part in preparing the City of Eagle's Hazard Mitigation Plan development effort. The purpose of this newsletter is to keep you informed and to allow you every opportunity to voice your opinion regarding these important projects. Please contact your community representative or Scott Simmons, URS directly if you have any questions, comments, or requests for more information:

City of Eagle
Planning Team Leader
Donald Woodruff, Mayor
P.O. Box 1901
Eagle, AK 99736
Phone: 547.2282
eaglety@aptalaska.net

URS Corporation
Scott Simmons, Hazard Mitigation, Emergency Management, and Climate Change Planner
3201 C Street, Suite 200
Anchorage, Alaska 99503
433.6711 or 800.909.6787
scott.simmons@urs.com

Division of Homeland Security & Emergency Management
Scott Nelsen, State Support
PO Box 5750
Anchorage, AK 99505-5750
428.7010 or 800.478.2337
scott.nelsen@alaska.gov

Memo for Record

700 G Street, Suite 500
Anchorage, AK 99501
Phone: 907.261.9706
Fax: 907.562.1297

SUBJECT: Follow-up to City and Native Village of Eagle HMP – Mitigation Strategy Teleconference

Community: City/Village of Eagle

Date/Time: City January 15, 2014 and Village: February 12, 2014

Attendees:

- URS: Scott Simmons
- Mayor Donald Woodruff
- Tribal Administrator Joyce Roberts:

Comments:

- **Subjects covered included:**
  - Mitigation project selection process, goal development and onfirmation
- **Participant Introduction**
- **Mitigation Strategy Development:**
  - Explained the Mitigation Strategy development process
  - Introduced Mitigation Goals purpose and reached consensus on suggested goals for the City and the Village respectively
  - Reviewed the Mitigation Project Consideration Sheet
  - Identified ongoing or existing City or Tribal mitigation initiatives
  - Selected mitigation initiatives for implementation and refinement within the Mitigation Action Plan Matrix.
  - Explained how the information discussed would be implemented and expanded within the Mitigation Action Plan Matrix and returned to the community for review.
    - Matrix will include:
      - Initiative Priority
      - Responsible Entity
      - Potential Funding Sources
      - Implementation Timeframe
      - Benefit /Cost and Technical Feasibility narrative description
  - Teleconference Follow-up
  - A second newsletter will be developed once the Mitigation Strategy is finalized and incorporated into the Draft HMP. The newsletter should be posted or distributed throughout the community to inform the community that the HMP is available for public review and comment.

Mitigation Goals and Action Items Considered

Table 7-x Mitigation Goals

No.	Goal Description
Multi-Hazards (MH)	
MH 1	Promote recognition and mitigation of all natural and manmade hazards that affect the City of Eagle (City) and Native Village of Eagle (Village).
MH 2	Promote cross-referencing mitigation goals and actions with other City/Tribal planning mechanisms and projects.
MH 3	Reduce possibility of losses from all natural and manmade hazards that affect the City/Village.
Natural Hazards	
EQ 4	Reduce potential vulnerability to **earthquake** (EQ) damage and loss.
ER 5	Reduce potential **erosion** (ER) damage and loss.
FL 6	Reduce potential **flood** (FL) damage and loss.
GF 7	Reduce potential **ground failure** (GF) damage and loss.
SW 8	Reduce potential vulnerability to **severe weather** (SW) damage and loss.
WF 9	Reduce potential vulnerability to **wildland / tundra** (WF) fire damage and loss.

Sample Mitigation Action Items To Consider

Hazard	Status ***C****onsidered* ***S****elected* ***O****ngoing*	Description
Multi-Hazards (MH)		
MH 1	**S**	Identify and pursue funding opportunities to implement mitigation actions.
	C	Hold an annual or biennial "hazard meeting" to provide information to residents about recognition and mitigation of all natural hazards that affect the City of Eagle.
	S	Establish a formal role for the Hazard Mitigation Planning Team to develop a sustainable process to implement, monitor, review, and evaluate community wide mitigation actions.
	S	Develop, produce, and distribute information materials concerning mitigation, preparedness, and safety procedures for all identified natural hazards.
	C	Develop and implement strategies and educational outreach programs for debris management from natural hazard events.
	S	Disseminate FEMA pamphlets to educate and encourage homeowners concerning structural and non-structural retrofit benefits.
	C	Develop outreach program to educate residents concerning benefits of increased seismic resistance and modern building code compliance during rehabilitation or major repairs for residences or businesses.
	C	Develop outreach program with school district contests having students develop, display, and explain mitigation projects or initiatives.
		Investigate benefits of, and potentially Join the National Flood Insurance Program to reduce monetary losses to individuals and the community.
		Develop an outreach program to educate public concerning NFIP participation benefits, floodplain development, land use regulation, and NFIP flood insurance availability to facilitate continued compliance with the NFIP.
	S	Develop outreach program to educate residents concerning flood proofed wells, sewer/septic or other non-residential facilities.
	O	Identify critical facilities and vulnerable populations based on identified (and mapped where applicable) high hazard areas.
	O	Identify evacuation routes away from high hazard areas and develop outreach program to educate the public concerning warnings and evacuation procedures.
	O	Acquire emergency warning sirens to communicate critical emergency warnings and alerts.
	C	Update public emergency notification procedures and develop an outreach program for potential hazard impacts or events.
		Develop outreach program to educate residents concerning flood proofed wells, sewer/septic or other non-residential facilities.
MH 2	**S**	The City will aggressively manage their existing plans to ensure they incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, and land use plans, etc. to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.
	C	Review ordinances and develop outreach programs to assure propane tanks are properly anchored and hazardous materials are properly stored and protected from known natural hazards such as flood or seismic events.
	S	Integrate the Mitigation Plan hazard analysis findings for enhanced emergency planning.
	C	Develop, incorporate, and enforce building ordinances commensurate with building codes to reflect survivability from flood, fire, wind, seismic, and other hazards to ensure occupant safety.
	C	Develop and incorporate mitigation provisions and recommendations into all community plans and community development processes to maintain protect

Sample Mitigation Action Items To Consider

Hazard	Status *C*onsidered *S*elected *O*ngoing	Description
		critical infrastructure, residences, and population from natural hazard impacts.
		Update or develop, implement, and maintain jurisdictional debris management plans.
	S	Prohibit new construction in identified mitigatable hazard impact areas (avalanche, flood, erosion, etc.) or require building to applicable building codes for other hazard impacts (earthquake, volcanic ash, weather, etc.).
	S	Identify and list repetitively flooded structures and infrastructure, analyze the threat to these facilities, and raise mitigation action priorities to protect the threatened population.
		Perform hydrologic and hydraulic engineering, and drainage studies and analyses. Use information obtained for feasibility determination and project design. This information should be a key component, directly related to a proposed project.
	C	Develop prioritized list of mitigation actions for threatened critical facilities and other buildings or infrastructure.
		Develop process to regulate future development in high hazard impact areas (For example, require permitting, geotechnical review, and soil stabilization technique implementation, etc.).
		Update Emergency Response Plans to discuss volcanic ashfall, tsunami, and stormwater event management, prioritize response actions, and initiate actions to fill capability gaps.
MH 3	**O**	Acquire (buy-out), demolish, or relocate structures from hazard prone area (erosion, flood, ground failure, etc.) Property deeds "must be" restricted for open space uses for perpetuity to keep people from rebuilding in known hazard areas.
	S	Encourage utility companies to evaluate and harden vulnerable infrastructure elements for sustainability.
		Increase power line wire size and incorporate quick disconnects (break---away devices) to reduce ice load and windstorm power-line failure during severe wind or winter ice storm events.
		Harden utility headers located along river embankments to mitigate potential flood, debris, and erosion damages.
		Purchase and install generators with main power distribution disconnect switches for identified and prioritized critical facilities susceptible to short term power disruption. (i.e. first responder, medical facilities, schools, correctional facilities, and water and sewage treatment plants, etc.)
		Develop vegetation projects to restore erosion, ground failure, or other hazard impact damages and to provide slope stability in avalanche or landslide areas.
	C	Develop, implement, and enforce floodplain management ordinances.
		Update the Storm-Water Management Plan to include regulations to control flood runoff and to minimize ground failure from saturated soils, steep slope collapse, and erosion or scour.
		Develop a vegetation management plan addressing slope-stabilizing root strength to maintain or encourage precipitation containment. ()
		Develop land use guidelines to minimize hazard impacts and damages such as: reduce vegetation removal to maintain slope stability from rain, snowmelt run-off, and erosion impacts.
Natural Hazards		
EQ 4	NONE	Evaluate critical public facilities with significant seismic vulnerabilities and complete retrofit. (e.g. evaluate fire stations, public works buildings, potable water systems, wastewater systems, electric power systems, and bridges, etc.)
		Inspect, prioritize, and retrofit any critical facility or public infrastructure that does not meet current State Adopted Building Codes.

Sample Mitigation Action Items To Consider

Hazard	Status *C*onsidered *S*elected *O*ngoing	Description
		Install non-structural seismic restraints for large furniture such as bookcases, filing cabinets, heavy televisions, and appliances to prevent toppling damage and resultant injuries to small children, elderly, and pets.
ER 5	O	Develop mitigation initiatives such as: Rip-rap (large rocks), sheet pilings, gabion baskets, articulated matting, concrete, asphalt, vegetation, or other armoring or protective materials to provide river bank protection.
	O	Harden culvert entrance bottoms with asphalt, concrete, rock, or similar material to reduce erosion or scour.
		Install walls at the end of a drainage structure to prevent embankment erosion at its entrance or outlet. (end- or wing-walls).
FL 6		Develop and maintain NFIP compliant Repetitive Loss, Severe Repetitive Loss, and Repetitive Flood Claim (RFC) property inventory. Inventory should include property type, structure type, number of buildings, and their geo-referenced locations.
		Establish flood mitigation priorities for critical facilities, residential structures, and commercial buildings located within the identified flood hazard area(s) (100- and 500-year floodplains, stormwater, etc.) based on current base flood elevation (BFE) survey elevation data.
	S	Determine and implement most cost beneficial and feasible mitigation actions for locations with repetitive flooding, significant historical damages, or road closures.
		Elevate residential, public, or critical facilities at least two feet above the (BFE).
		Install NOAA/NWS stream flow and rainfall measuring gauges.
		Dry flood-proof non-residential, historical, and/or residential structures. (Make watertight or impermeable to flood water).
		• *Anchor building to prevent flotation, collapse, or lateral movement.*
		• *Install watertight closure doors and windows.*
		• *Reinforce walls to withstand floodwater pressures and impact forces generated by floating debris.*
		• *Use membranes and other sealants during construction to reduce floodwater seepage through walls and wall openings.*
		• *Install pumps to control interior water levels*
		• *Install check valves to prevent floodwater or sewage flow entrance through utilities openings.*
		• *Locate electrical, mechanical, utility, and other valuable-damageable equipment and contents above the expected flood level.*
		• *Construct protective berm, floodwall, or small levee around a building to prevent floodwater intrusion.*
	O (DOT)	Increase culvert sizes to increase their drainage capacity or efficiency.
		Construct debris basins to retain debris in order to prevent downstream drainage structure clogging.
		Install debris cribs over culvert inlets to prevent inflow of coarse bed-load and light floating debris.
		Create detention storage basins, ponds, reservoirs etc. to allow water to temporarily accumulate excess water to reduce pressure on culverts; and construct low water crossings to allow water to ultimately return to its watercourse at a reduced flow rate.
		Create relief drainage ditch-openings using culverts or bridges to relieve rapid water accumulation during high water-flow events.
		Protect wastewater treatment systems flood protection to prevent erosion or flooding damage and sewage lagoon out-wash.
	S	Construct water treatment system to improve water quality over existing

Sample Mitigation Action Items To Consider

Hazard	Status *C*onsidered *S*elected *O*ngoing	Description
		community well structure which continually gets contaminated from Ice Jam Flood events
GF 7		Complete a ground failure location inventory (avalanche, landslide, permafrost, sink holes, etc.); identify and potentially map threatened critical facilities, residential buildings, infrastructure, and other essential buildings.
		Develop, implement, and enforce a property development "ground failure" risk assessment for any structure that may be sited in potentially vulnerable locations.
		Identify and seasonally restrict recreational and construction activities in high avalanche and landslide areas.
	C	Promote permafrost sensitive construction practices in permafrost areas.
SW 8		Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms (snow load, ice, and wind).
		Develop and implement tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events.
	C	Develop, implement, and maintain partnership program with electrical utilities to use underground utility placement methods where possible to reduce or eliminate power outages from severe winter storms. Consider developing incentive programs.
	C	Develop personal use and educational outreach training for a "safe tree harvesting" program. Implement along utility and road corridors to prevent or reduce potential winter storm damage.
WF 9		Develop Community Wildland Fire Protection Plan to mitigate wildland fire threat.
	S	Hold FireWise workshop to educate residents and contractors concerning fire resistant landscaping.
	S	Promote FireWise building siting, design, and construction processes and materials.
	S	Provide wildland fire hazard outreach information in an easily distributed format for all residents.
	S	Develop, adopt, and enforce burn ordinances that controls outdoor burning, require burn permits, and restricts open campfires during identified weather periods (windy, dry, etc.).
	S	Develop outreach program to educate and encourage fire-safe construction practices for existing and new construction in high-risk areas.
	S	Identify, develop, implement, and enforce mitigation actions such as fuel breaks and reduction zones for potential wildland fire hazard areas.
	S	Construct a firebreak around the community to provide wildfire protection.

CITY AND NATIVE VILLAGE OF EAGLE HAZARD MITIGATION PLAN (HMP)

February 2014 **Newsletter 2**

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

HMP Development

The City and Native Village of Eagle was one of 11 communities selected by the State of Alaska, Division of Homeland Security and Emergency Management (DHS&EM) for a Hazard Mitigation Planning (HMP) development project. The plan identifies natural hazards that affect the community including earthquake, erosion, flood, ground failure, severe weather, and tundra/wildland fire. The HMP also identifies the people and facilities potentially at risk and potential actions to mitigate community hazards. The public participation and planning process is documented as part of the project.

What is Hazard Mitigation?

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

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

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

Why Do We Need A Hazard Mitigation Plan?

A community is only eligible to receive grant money for mitigation programs by preparing and adopting a hazard mitigation plan. Communities must have an approved mitigation plan to receive grant funding from the Federal Emergency Management Agency (FEMA) for eligible mitigation projects.

The Planning Process

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

The DMA2000 requires the plan to document the following topics:

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

FEMA has prepared a Local Planning Review Guide) and (available at: http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&id=4859). It explains how the HMP meets each of the DMA2000 requirements. FEMA has prepared and "Mitigation Planning Guidance" and "How to Guides" (available at: http://www.fema.gov/hazard-mitigation-planning-resources). The City's Hazard Mitigation Plan will follow those guidelines.

The planning process kicked-off on July 15, 2013 by establishing a local planning committee and holding a public meeting. The planning committee examined the full spectrum of hazards listed in the State Hazard Mitigation Plan and identified six hazards the HMP would address.

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

A mitigation strategy was the next component of the plan to be developed. Understanding the community's local capabilities and using information gathered from the public

and the local planning committee and the expertise of the consultants and agency staff, a mitigation strategy was developed. The mitigation strategy is based on an evaluation of the hazards, and the assets at risk from those hazards. Mitigation goals and a list of potential actions/projects were developed as the foundation of the mitigation strategy.

Mitigation goals are defined as general guidelines that explain what a community wants to achieve in terms of hazard and loss prevention. Goals are positively stated future situations that are typically long-range, policy-oriented statements representing community-wide visions. Mitigation actions and projects are undertaken in order to achieve your stated objectives. The City on January 15, 2014, and the Village on February 12, 2014 the City Planning Teams identified projects and/or actions for each hazard that focus on six categories: prevention, property protection, public education and awareness, natural resource protection, emergency services, and structural projects. A representative sample of the mitigation actions identified as a priority by the planning team are listed below, and explained in more detail in the plan.

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

The draft plan is available in the City and Tribal offices for public review and comment. Comments should be made via email, fax, or phone to Scott Simmons (listed below) and be received no later than February 28, 2014. The plan will be provided to DHS&EM and FEMA for their preliminary approval and returned to Eagle's City and Tribal Councils for City formal adoption and Tribal agreement to implement.

The Planning Committee

The plan was developed with the assistance from the community's planning committee consisting of a cross section from the community. Planning Team members who helped with developing the plan include co-Team Leaders, Eagle Mayor Donald Woodruff and Tribal Administrator Joyce Roberts with their respective City and Tribal Councils;, and URS Corporation.

Sample of the City and Native Village of Eagle's Mitigation Actions. Review the draft HMP for a complete list.		
City/Tribal: Identify and pursue funding opportunities to implement mitigation actions.	City: Develop, produce, and distribute information materials concerning mitigation, preparedness, and safety procedures for all identified natural hazards.	Tribal: Hold an annual or biennial "hazard meeting" to provide information to residents about recognition and mitigation of all natural hazards that affect the Eagle area.
City/Tribal: Disseminate FEMA pamphlets to educate and encourage homeowners concerning structural and non-structural retrofit benefits.	Acquire emergency warning sirens to communicate critical emergency warnings and alerts.	Promote ground failure (such as permafrost) sensitive construction practices in hazard impact areas.
Identify evacuation routes away from high hazard areas and develop outreach program to educate the public concerning warnings and evacuation procedures.	Integrate the Mitigation Plan hazard analysis findings for enhanced emergency planning.	Develop and implement tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events.
City/Village will strive to manage their existing plans to ensure they incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, and land use plans, etc. to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.	Construct water treatment system to improve water quality over existing community well structure which continually gets contaminated from Ice Jam Flood events	Evaluate and modify Village Watering Point to provide residents a viable community watering source. Residents currently haul water from the City of Eagle's well.
Prohibit new construction in identified mitigatable hazard impact areas (avalanche, flood, erosion, etc.) or require building to applicable building codes for other hazard impacts (earthquake, volcanic ash, weather, etc.).	Hold FireWise workshop to educate residents and contractors concerning fire resistant landscaping.	Identify, develop, implement, and enforce mitigation actions and protective measures for ***fuel breaks and wildland fire fuels reduction zones*** to assure sustainability.

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

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Appendix E
Benefit–Cost Analysis Fact Sheet

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Benefit-Cost Analysis Fact Sheet

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

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

All Benefit-Costs must be:

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

General Data Requirements:

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

Damage and Benefit Data

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

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

Building Data

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

Use Correct Occupancy Data

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

Questions to Be Answered

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

Common Shortcomings

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

Appendix F

Plan Maintenance Documents

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Annual Review Questionnaire

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

Mitigation Action Progress Report

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