City of Tanana/Native Village of Tanana, Alaska

Multi-Jurisdictional Hazard Mitigation Plan

December 2017

Prepared by:

City of Tanana

Native Village of Tanana

LeMay Engineering & Consulting, Inc.

Acknowledgements

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Ariella Derrickson
Charlie Campbell
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Cliff Wiehl
Patrick Moore

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Tribal Council

Helium "Una" Edwardsen, Chairperson
Curtis Sommer, Vice-Chair
Courtney Agnes, Secretary/Treasurer
Dayna Folger
Jeanette Walker
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Technical Assistance

Alaska State Division of Homeland Security & Emergency Management

Brent Nichols, CFM, SHMO

Tanana Planning Leaders

Jeff Weltzin (City Manager)
Shannon Erhart (Tribal Executive Director)

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Acronyms

AKTCSD	Tanana School District
ANCSA	Alaska Native Claims Settlement Act
APA	Approval Pending Adoption
ARDORs	Alaska Regional Development Organizations
BCA	Benefit-Cost Analysis
BCR	Benefit-Cost Review
CDBG	Community Development Block Grant
CDC	Center for Disease Control
CFR	Code of Federal Regulations
CWPP	Community Wildfire Protection Plan
DCCED	(Alaska) Department of Commerce, Community and Economic Development
DCRA	(DCCED) Division of Community and Regional Affairs
DRF	Disaster Relief Fund
DHS&EM	(Alaska) Division of Homeland Security and Emergency Management
DMA	Disaster Mitigation Act
DOT/PF	Department of Transportation and Public Facilities
EHRSAP	Earthquake Hazards Reduction State Assistance Program
EWP	Emergency Watershed Protection
°F	Degrees Fahrenheit
FEMA	Federal Emergency Management Agency
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HMPG	Hazard Mitigation Planning Grant
HMTAP	Hazard Mitigation Technical Assistance Program
IA	Individual Assistance
LHMP	Local Hazard Mitigation Plan
MJHMP	Multi-Jurisdictional Hazard Mitigation Plan
NRCS	Natural Resource Conservation Service
NFIP	National Flood Insurance Program
NOAA	National Oceanographic and Atmospheric Administration
NRCS	National Resource Conservation Service
PA	Public Assistance
PDM	Pre-Disaster Mitigation
PDMG	Pre-Disaster Mitigation Grant
RCASP	Remote Community Alert Systems Program
REAA	Regional Educational Attendance Area
SBA	Small Business Administration
SHMO	State Hazard Mitigation Office
USACE	United States Army Corps of Engineers, Alaska District

USC	United States Code
USGS	United States Geological Survey
VPSO	Village Public Safety Officer

Commitment Letter

November 15, 2017

Brent Nichols, CFM
State of Alaska
DMVA DHS&EM
P.O. Box 5750
Joint Base Elmendorf-Richardson, Alaska 99505-5750

Mr. Nichols:

This letter serves as the City of Tanana's Letter of Commitment to support DMVA DHS&EM and LeMay Engineering & Consulting, Inc. in their Federal Emergency Management Agency (FEMA) Pre-Disaster Mitigation (PDM) planning grant to update the 2011 hazard mitigation plan for the City of Tanana. The end goal of this grant is a State- and FEMA- approved hazard mitigation plan that the City of Tanana will adopt.

Sincerely,

Jeff Weltzin
Tanana City Manager

"WHERE THE TWO RIVERS MEET"

TANANA TRIBAL COUNCIL

PO Box 130, Tanana, AK 99777

Phone: (907) 366-7160 or 7170 Fax: (907) 366-7195

November 15, 2017

Brent Nichols, CFM
State of Alaska
DMVA DHS&EM
PO Box 5750
Joint Base Elmendorf-Richardson, Alaska 99505-5750

Mr. Nichols:

This letter serves as the Tanana Tribal Council's letter of Commitment to support DMVA DHS&EM and LeMay Engineering & Consulting, Inc. in their Federal Emergency Management Agency (FEMA) Pre-Disaster Mitigation (PDM) planning grant to update the 2011 hazard mitigation plan for the City/Tribe of Tanana. The end goal of this grant is a State-and FEMA-approved hazard mitigation plan that the Tanana Tribe will adopt.

Sincerely,

Helium Edwardsen, Chairman/Chief

Adoption Resolution

CITY OF TANANA
P.O. Box 249
Tanana , Alaska 99777
(907) 366-7159 • Fax (907) 366-7169

RESOLUTION 2019 - 4

ADOPTING THE TANANA MULTI-JURISDICTIONAL HAZARD MTIGATION PLAN

WHEREAS, The City of Tanana, with the assistance from LeMay Engineering & Consulting, Inc. the State of Alaska Division of Homeland Security and Emergency Management, the Tanana Tribal Council, and members of the Tanana Mitigation Planning Group has gathered information and prepared the Tanana Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, The Tanana Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, The City of Tanana is a local municipal governmental until of Tanana that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, The City of Tanana has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW THEREFORE, BE IT RESOLVED by the City Council, that the City of Tanana adopts the Tanana Multi-Jurisdictional Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

Certification

ADOPTED this 23rd day of September 2019 at the meeting of the Tanana City Council by a vote of 5 yes, 0 no, 0 abstain.

Pat Moore - Mayor

Council Member

"WHERE THE TWO RIVERS MEET"

TANANA TRIBAL COUNCIL

PO Box 130, Tanana, AK 99777

Phone: (907) 366-7160 or 7170 Fax: (907) 366-7195

RESOLUTION 2019 – 04

ADOPTING THE TANANA MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, The Native Village of Tanana, with the assistance from LeMay Engineering & Consulting, Inc., the State of Alaska Division of Homeland Security and Emergency Management, the Tanana Tribal Council, and members of the Tanana Mitigation Planning Group has gathered information and prepared the Tanana Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, The Tanana Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, The Native Village of Tanana is a local municipal governmental unit of Tanana that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, The Native Village of Tanana has reviewed the Plan and affirms that the Plan will be updated no less than every five years.

NOW THEREFORE BE IT RESOLVED by the City Council that the Native Village of Tanana adopts the Tanana Multi-Jurisdictional Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan and resolves to execute the actions in the Plan.

CERTIFICATION

Adopted this 7th day of February 2019 at the Special Meeting of the Tanana Tribal Council by a vote of 5 yes, 0 no, 0 abstains.

Curtis Sommer – First Chief

Christine Eshart

Council Member

FEMA Approval Letter

U.S. Department of Homeland Security
FEMA Region 10
130 – 228th Street, SW
Bothell, Washington 98021-8627

FEMA

March 22, 2019

The Honorable Pat Moore
Mayor, City of Tanana
P.O. Box 249
Tanana, AK 99777

Dear Mayor Moore:

On March 12, 2019, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10, approved the Tanana Multi-Jurisdictional Hazard Mitigation Plan as a multi-jurisdictional local plan as outlined in Code of Federal Regulations Title 44 Part 201. This approval provides the below jurisdictions eligibility to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's, Hazard Mitigation Assistance (HMA) grants projects through March 11, 2024, through your state:

City of Tanana	Native Village of Tanana

The updated list of approved jurisdictions includes the Native Village of Tanana that recently adopted the Tanana Multi-Jurisdictional Hazard Mitigation Plan. To continue eligibility, jurisdictions must review, revise as appropriate, and resubmit the plan within five years of the original approval date.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Mike Johnson, State Mitigation Planner with Alaska Division of Homeland Security and Emergency Management, at (907) 428-7055, who coordinates and administers these efforts for local entities.

Sincerely,

Mark Carey, Director
Mitigation Division

Enclosure

cc: Brent Nichols, Alaska Division of Homeland Security and Emergency Management

JS:vl

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

FEMA

MAR 22 2019

The Honorable Curtis Sommer
First Chief, Tanana Tribal Council
P.O. Box 130
Tanana, Alaska 99777

Dear First Chief Sommer:

Congratulations, on March 12, 2019, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10 approved the *Tanana Multi-Jurisdictional Hazard Mitigation Plan* as a Tribal Mitigation Plan, in accordance with Code of Federal Regulations Title 44 Part 201.

An approval provides the Native Village of Tanana eligibility to apply directly with FEMA for Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) programs, i.e., Pre-Disaster Mitigation project grants, Public Assistance (Categories C-G), Fire Management Assistance and Hazard Mitigation Grant Program (HMGP) projects through March 11, 2024. Recipients are required to develop and maintain hazard mitigation plans compliant with FEMA standards as a condition for receiving funds. To continue eligibility, within five years from the date of this letter, tribes must review, revise as appropriate and re-submit plans for approval. For further assistance on hazard mitigation planning, please contact our Regional Hazard Mitigation Planning Manager, John Schelling, at (425) 487-2104, John.Schelling@fema.dhs.gov.

FEMA's approval of your plan as a Tribal Mitigation Plan provides the Native Village of Tanana eligibility to apply for various Stafford Act programs. FEMA evaluates applications for funding according to the specific requirements of the applicable program. A mitigation action identified in the plan may, or may not, meet a program's eligibility requirements. For assistance with hazard mitigation grant funding, please contact FEMA-R10-HMA@fema.dhs.gov.

We look forward to continuing a productive relationship between FEMA Region 10 and the Native Village of Tanana. Our Regional Tribal Liaison Ramona VanCleve, at 907-271-4302, is available to facilitate this relationship and delivery of our programs. You are also welcome to contact me directly, at (425) 487-4604.

Sincerely,

Michael F. O'Hare
Regional Administrator

Enclosures

cc: Brent Nichols, Alaska Division of Homeland Security and Emergency Management

Chapter 1. Planning Process and Methodology

1.1 Introduction

Hazard mitigation is the process of profiling hazards, analyzing risk, and developing preventative actions. When preventative actions are implemented, risks are reduced or eliminated. This joint Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) for the City of Tanana (City) and the Native Village of Tanana (NTV) includes information to assist the City and Tribal government and residents with planning to avoid future disaster losses. The plan provides information on natural hazards that affect Tanana, describes past disasters, and lists projects that may help the community prevent disaster losses. The plan was developed to help the City and Tribe make decisions regarding natural hazards that potentially could affect Tanana.

1.1.1 Purpose

The purpose of this MJHMP is to identify and coordinate risk mitigation efforts with State, Federal, and local partners and to fulfill the requirements set forth by the Code of Federal Regulations (CFR), Title 44 "Emergency Management and Assistance", Part 201 "Mitigation Planning", Subsections 6 and 7 (44 CFR §201.6, §201.7):

> 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 Hazard Mitigation Assistance (HMA) programs in both the pre- and post-disaster timeframes.

Current Federal regulations 44 CFR §201.6 and §201.7 require local communities and tribes, except under Regional Administrator approved "extraordinary circumstances" [§201.6(a)(3)], to have a Federal Emergency Management Agency (FEMA) approved hazard mitigation plan for most of FEMA's grant programs [all but Public Assistance (PA) Categories A, B, and Individual Assistance (IA)]. Currently, Federal regulations require local plans to be formally updated and approved by FEMA every five years.

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 HMA 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 (LHMPs) now qualify communities for several Federal HMA grant programs.

This MJHMP complies with Title 44 CFR current as of March 11, 2015 and applicable guidance documents. Specific FEMA programs, such as PA Categories C through G, Pre-Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA), and the Hazard Mitigation Grant Program (HMGP) are detailed in Chapter 2, Subsection "Resources."

1.1.2 Authority

On October 30, 2000, Congress passed the Disaster Mitigation Act (DMA) of 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 FEMA's mitigation plan requirements for mitigation grant assistance.

For implementation guidance, FEMA published the Final Rule in the Federal Register on September 16, 2009 [Docket ID FEMA-2006-0010], 44 CFR Part 201 with subsequent updates. The planning requirements for local entities are described in detail throughout this chapter and are identified in their appropriate sections throughout this HMP.

Alaskan Native Tribes with an approved Tribal Mitigation Plan in accordance with 44 CFR 201.7 may apply for assistance from FEMA as a grantee. If the Tribe coordinates with the State of Alaska for development and review of their Tribal Mitigation Plan, then the Tribe also has the option to apply through the State as a subgrantee. A grantee is an entity such as a State, territory, or Tribal government to which a grant is awarded and is accountable for use of the funds. A subgrantee is an entity, such as a community, local, or Tribal government; State-recognized tribe; or a private nonprofit organization to which a subgrant is awarded and is accountable to the grantee for use of the funds.

The NTV will continue to comply with all applicable Federal statues and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in 44 CFR 13.11(d).

1.2 Plan Development

The City and NVT developed their join plan with assistance from the State of Alaska, Division of Homeland Security and Emergency Management (DHS&EM). This plan includes:

1. Community demographic, land use, and economic information.
2. A review of the local hazards facing the community.
3. A hazard vulnerability assessment and exposure analysis.
4. A hazard mitigation strategy with attainable goals and actions.
5. A glossary of terms.
6. A list of incorporated planning documents.

NVT members reside within the City of Tanana and are included as City residents in all State and Federal demographic research. NVT owns no land. The planning area for the City and Tribe are identical.

Project Staff

The City of Tanana and Native Village of Tanana designated Tanana City Manager, Jeff Weltzin, and Native Village of Tanana Executive Director, Shannon Erhart, as the primary local staff on this project.

LeMay Engineering & Consulting, Inc. was contracted to assist the community in updating the MJHMP. Brent Nichols of the DHS&EM provided technical assistance and reviewed the plan. Table 1 identifies the Planning Team.

Table 1. Hazard Mitigation Planning Team

NAME	TITLE	ORGANIZATION	PHONE
Donna Folger	Mayor	City of Tanana	(907) 366-1025
Charlie Campbell	Member	Tanana City Council	(907) 366-7111
Ariella Derrickson	Member	Tanana City Council	(907) 328-8687
Aaron Kozenikoff Sr.	Member	Tanana City Council	(907) 366-1199
Patrick Moore	Member	Tanana City Council	(907) 366-1054
Cliff Wiehl	Member	Tanana City Council	(907) 366-7217
Charlie Wright	Member	Tanana City Council	(907) 366-7216
Helium "Una" Edwardsen	Tribal Chairperson	Tanana Tribal Council	(907) 371-6327
Curtis Sommer	Tribal Vice-Chair	Tanana Tribal Council	(907) 366-7212
Courtney Agnes	Member	Tanana Tribal Council	(907) 366-1040
Dayna Folger	Member	Tanana Tribal Council	(907) 366-1011
Jeanette Walker	Member	Tanana Tribal Council	(907) 366-1213
Judy Kangas	Member	Tanana Tribal Council	(907) 366-7134
Julie Roberts-Hyslop	Member	Tanana Tribal Council	(907) 366-7124
Shannon Erhart	Tribal Executive Director	Native Village of Tanana	(907) 360-7160 ex 200
Jeff Weltzin	City Manager	City of Tanana	(907) 590-1304
Patrick LeMay, PE	Planner/Consultant	LeMay Engineering & Consulting, Inc.	(907) 250-9038
Jennifer LeMay, PE, PMP	Lead Planner/Consultant	LeMay Engineering & Consulting, Inc.	(907) 350-6061
Audra Lehman, PhD	Planner/Consultant	LeMay Engineering & Consulting, Inc.	(806) 778-9742
Brent Nichols, CFM	State Hazard Mitigation Officer	DHS&EM	(907) 428-7085

Plan Research

The following five-step process took place from November 2017 through April 2018:

1. Organize resources: Members of the planning team identified information resources, such as local experts and various organizations, capable of providing the technical expertise and historical information.
2. Assess risks: The planning team reviewed their hazards and risk assessments.
3. Assess capabilities: The planning team assessed their community's current administrative, technical, regulatory, and fiscal capabilities.
4. Develop the mitigation strategy: The planning team identified and prioritized their mitigation

goals and actions.

5. Monitor, evaluate, and update the plan: The planning team evaluated their goals and actions for compatibility with community priorities.

The plan was developed utilizing existing Tanana plans and studies as well as outside information and research. The following list contains the most significant of the plans, studies, and websites that were used in preparing this document. Additional sources are listed in the bibliography.

1. *Division of Community and Regional Affairs (DCRA) Community Information*: https://www.commerce.alaska.gov/web/dcra/
2. *Alaska Critical Facilities Inventory, FEMA-TO 08-J-0011, December 2008.*
3. *Tanana Community Wildfire Protection Plan, promulgated in 2011.*
4. *Tanana Community Priority Plan, July 2010.*
5. *City of Tanana, Alaska Preliminary Drainage Plan, February 2011.*
6. *Tanana Solid Waste Management Plan, February 2009.*
7. *Tanana Tribal Council Emergency Response Plan, 2009.*
8. *Alaska Interagency Fire Management Plan, Tanana/Minchumina Area and Environmental Analysis, March 1982.*
9. *City of Tanana, Fire Evacuation Plan, 2015.*
10. *State of Alaska* HMP, prepared by DHS&EM, October 2013.
11. FEMA How to Guides:
    a. *Getting Started: Building Support For Mitigation Planning* (FEMA 386-1)
    b. *Local Mitigation Planning Handbook*, March 1, 2013
    c. *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA 386-2)
    d. *Developing The Mitigation Plan: Identifying Mitigation Actions And Implementing Strategies* (FEMA 386-3)
    e. *Bringing the Plan to Life: Implementing the Hazard Mitigation Plan* (FEMA 386-4)
    f. *Using Benefit-Cost Review in Mitigation Planning* (FEMA 386-5)
12. USGS Earthquake Probability Mapping: https://earthquake.usgs.gov/hazards/hazmaps/
13. Alaska Interagency Wildlife Management, http://fire.ak.blm.gov/predsvcs/maps.php

Three documents have been written since the 2011 Tanana HMP. Mitigation action items from the 2011 Tanana HMP were incorporated into all three documents: the 2011 City of Tanana, Alaska Preliminary Drainage Plan; the 2011 Community Wildlife Protection Plan, and the 2015 City of Tanana, Fire Evacuation Plan. 2017 status updates of mitigation actions are included in Table 23.

<u>General Hazard Planning Web Sites</u>

American Planning Association: http://www.planning.org

Association of State Floodplain Managers:	http://www.floods.org
Federal Emergency Management Agency:	http://www.fema.gov
Community Rating System:	http://www.fema.gov/national-flood-insurance-program-community-rating-system
Flood Mitigation Assistance Program:	https://www.fema.gov/flood-mitigation-assistance-grant-program
Hazard Mitigation Grant Program:	http://www.fema.gov/hazard-mitigation-grant-program
Individual Assistance Program:	http://www.fema.gov/individual-assistance-program-tools
Interim Final Rule:	https://www.fema.gov/media-library/assets/documents/4590
National Flood Insurance Program:	http://www.fema.gov/national-flood-insurance-program
Public Assistance Program:	http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit/

Public Involvement

In Tanana, collaboration and review are most beneficial when participants are provided with a draft document to review and critique. Rather than begin the process at the stakeholder level, it is necessary for a rough draft to be developed which can be used by the community to provide constructive feedback. LeMay Engineering & Consulting, Inc. developed an updated plan from the 2011 City of Tanana LHMP. The City and Tribe of Tanana work well together, and the public, as defined for Tanana, consists of all residents residing in Tanana.

Newsletter #1 was posted within the community of Tanana inviting the residents to attend one of three meetings in November. Then, LeMay Engineering & Consulting, Inc. held an introductory hazard mitigation plan committee meeting with the Tanana Native Council on the afternoon of November 15, 2017 at the Tribal Office. An introductory hazard mitigation plan committee meeting was also held as an agenda item of the City Council meeting at 7 pm on November 15, 2017, at the City Office. Patrick LeMay presented on the hazard mitigation planning process with respect to updating existing plans at each of these introductory meetings. Attendees of the City Council meeting included community members, City and NVT Council members, City of Tanana employees, the City Village Public Safety Officer (VPSO), Tanana School District (AKTCSD) members, and a representative from Tanana Power Company. A follow-up meeting was held on November 16, 2017 with City Manager, Jeff Weltzin, and City Council member, Pat Moore (via phone). Input received was incorporated into the Draft MJHMP. A copy of the Draft MJHMP was available for public review at the City and NTV Offices. Newsletter #2 was posted within Tanana announcing the availability of the Draft MJHMP for public review and inviting community members to attend the joint City and Tribal Christmas party on December 22, 2017 where a public hearing would be held on the Draft MJHMP.

Patrick LeMay summarized the Draft MJHMP at the Tanana Christmas party held at the school at 6 pm on December 22, 2017. One comment was received. Charlie Wright asked that the following mitigation action be added to the MJHMP Update: "Elevate approximately 100 feet of road damaged by inadequate insulation. This road is plagued by flooding and is the evacuation route between the City and the airport". This comment was incorporated into the Draft MJHMP before submission of the MJHMP Update to DHS&EM and FEMA. The City and NVT approved the MJHMP and adopted the MJHMP for implementation into their community on TBD.

Appendix A include public involvement documentation such as newsletters, jurisdiction commitment letters, meeting sign-in sheets, and comments.

1.3 Plan Maintenance

This MJHMP will be maintained using the following five step process:

1. Incorporation into existing planning mechanisms.
2. Continued public involvement.
3. Monitoring, reviewing, evaluating, and updating the MJHMP.
4. State and FEMA review and technical assistance.
5. Formal plan adoption and assurances.

Incorporation into Existing Planning Mechanisms

The planning team will incorporate planning mechanisms into their MJHMP through the following activities:

- Research the community's regulatory tools when implementing mitigation planning initiatives.
- Involve pertinent agencies when integrating hazard mitigation concepts.
- Update or amend existing planning mechanisms as necessary.

The City Manager and Tribal Executive Director will be jointly responsible for providing a list of all City and NVT documents related to Tanana to contractors focused on developing new or updating existing City and NVT Plans and ensuring that this MJHMP is incorporated into plans as applicable.

The City and NVT Councils will involve the public to continually reshape and update this MJHMP. A paper copy of this plan will be available at the City and NVT offices. This MJHMP will also be stored on the State Department of Commerce, Community, and Economic Development Community and Regional Affairs (DCCED/DCRA) plans website for public reference, https://www.commerce.alaska.gov/web/dcra/PlanningLandManagement/CommunityPlansAndInfrastructure.aspx after plan approval and adoption.

Continued Public Involvement

The City Manager and Tribal Executive Director will schedule a review of this MJHMP on an annual basis and will post fliers inviting everyone to participate. Any public comments regarding this review will be collected by the planning team leaders, included in the annual report and considered during future plan updates. The City of Tanana and NVT will host a table at the Spring Carnival, the 1st week in April, where

they will distribute surveys on an annual basis (see Appendix E). Completed surveys will be included in each annual report.

Monitoring, Evaluating, and Updating the Plan

> Section §201.6(c)(4)(i) of the mitigation planning regulation requires that 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.

Monitoring the Plan: The City Manager or his designee and the Tribal Executive Director or her designee are jointly responsible for monitoring the plan. On an annual basis, both jurisdictions will seek a report from the agencies and departments responsible for implementing mitigation projects identified in Chapter 4 of this plan. The compiled report will be provided to the City and Tribal Councils as information and noticed to the public (see Appendix E). Public comments will be sought. A report outlining all five years of the plan monitoring will be included in the plan update.

Evaluating the Plan: The City Manager or his designee and the Tribal Executive Director or her designee will jointly evaluate this plan during the five-year cycle. On an annual basis, concurrent with the report above, the evaluation should assess whether:

- The goals and objectives address current and expected conditions.
- The nature, magnitude, and/or types of risks have changed.
- The current resources are appropriate for implementing the mitigation projects in Chapter 4.
- There are implementation problems, such as technical, political, legal, or coordination issues with other agencies.
- The outcomes have occurred as expected (a demonstration of progress).
- The agencies and other partners participated as originally proposed.

See Appendix E for the annual maintenance form.

Updating the Plan: Plans must be updated and resubmitted to FEMA for approval every five years in order to continue eligibility for FEMA HMA programs. Plan updates must demonstrate that progress has been made in the past five years to fulfill commitments outlined in the previously approved plan. This involves a comprehensive review and update of each section of the plan and a discussion of the results of evaluation and monitoring activities described above. Plan updates may validate the information in the previously approved plan or may involve a major plan rewrite. A plan update may not be an annex to this plan; it must stand on its own as a complete and current plan.

The tasks required to monitor, evaluate, and update the MJHMP are illustrated on Figure 1.

State and FEMA Review and Technical Assistance

Draft hazard mitigation plans are submitted to the State Hazard Mitigation Officer (SHMO) for review. The SHMO reviews the plan for consistency with the State HMP and the DMA 2000 regulations. The

primary guidance is the State Mitigation Plan Review Guide, March 9, 2015. The State assists the community with any necessary revisions and then forwards the plan to FEMA Region 10 for final review. If no further revisions are necessary, FEMA issues an "approval pending adoption" (APA) letter to the City and Tribal Councils. The City and NVT Councils will then formally adopt the plan by a resolution. Once the plan is adopted, the SHMO forwards a copy of the adoption resolution to FEMA Region 10 for final approval. FEMA sends the final approval letter to the community and the State for their records. Finally, the SHMO places a copy of the FEMA-approved MJHMP in DHS&EM files and on the State web site for reference.

Formal Plan Adoption and Assurances

The Tanana City and Tribal Councils support 44 CFR 201 and assure compliance with all applicable federal statutes and regulations during the periods for which they receive grant funding, in compliance with 44 CFR 13.11(c), and will amend their joint MJHMP whenever necessary to reflect changes in tribal or federal laws and statutes as required in 44 CFR 13.11(d). The City and NVT Councils, with assistance from the SHMO, the State Hazard Mitigation Advisory Committee, and FEMA, are responsible for monitoring, evaluating, and updating the MJHMP in accordance with 44 CFR §201.7.

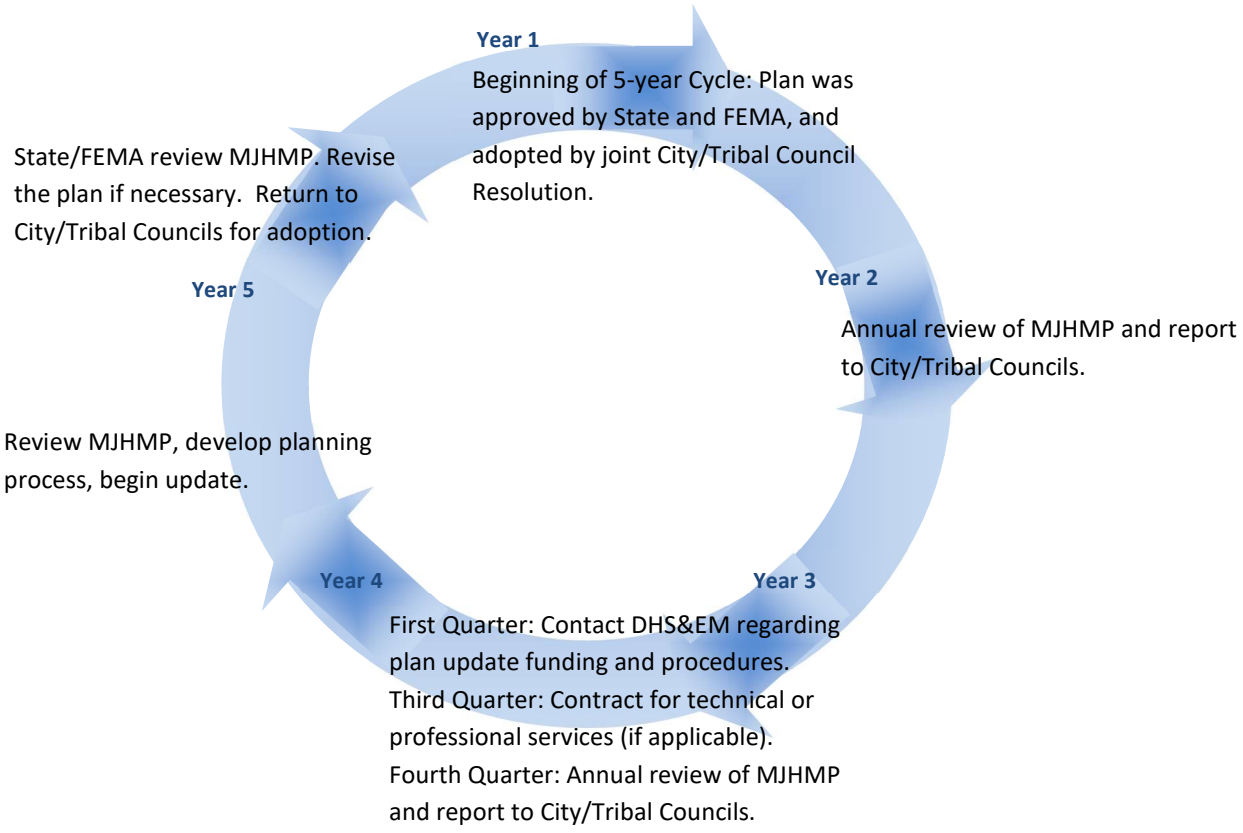


Figure 1. Hazard Mitigation Planning Cycle

Chapter 2. Community Profile

2.1 Community Overview

Location

Tanana is located in Interior Alaska about two miles west of the junction of the Tanana and Yukon Rivers, approximately 130 air miles west of Fairbanks. The area encompasses 11.6 square miles of land and 4.0 square miles of water. It lies at approximately 65.171940° north latitude and -152.078890° west longitude. Tanana is located in the Fort Gibbon Recording District.

Tanana is accessible only by air and river transportation. The city maintains 32 miles of local roads. The city operates a dock on the river; barged goods can be offloaded at a staging and storage area. The state owns and operates the Ralph M. Calhoun Memorial Airport, which has a lighted, gravel runway. Float planes land on the Yukon River. Cars, trucks, snow machines, ATVs and riverboats are used for local transportation. Groceries and other small items are shipped to the village by air, or by barge during the barging season from May to September.

Current Population: 224; 2017 DCRA referencing 2016 Department of Labor Estimate

Pronunciation: tan' uh naw

Incorporation Type: 1st Class City

Borough: Unorganized Borough

Census Area: Yukon-Koyukuk Census Area

Table 2 provides local and regional contact information for Tanana.

Table 2. Community Information

Community Information	Contact Information and Type
City of Tanana	City of Tanana Jeffrey Weltzin, City Manager P.O. Box 249 Tanana, AK 99777 Phone: (907) 366-7159 Fax: (907) 366-7169

Community Information	Contact Information and Type
	E-Mail: jeffreyweltzin@gmail.com
Borough Located In:	Unorganized
Native Village of Tanana	Shannon Erhart, Tribal Executive Director P.O. Box 130 Tanana, AK 99777 Phone: (907) 366-7160 Fax: (907) 366-7195 Email: serhart@tananatribe.org
Electric Utility	Tanana Power Company, Incorporated 6270 East Beechcraft Road Wasilla, AK 99654 Phone: (907) 745-5363 Fax: (907) 373-5599
School District	Tanana City School District (AKTCSD) Therese Ashton, Superintendent P.O. Box 89 Tanana, AK 99777 Phone: (907) 366-7203 Fax: (907) 366-7201 E-mail: tashton@aktcsd.org Website: http://www.wolfpride.tanana.net
Regional Native Non-Profit	Tanana Chiefs Conference 122 First Ave, Suite 600 Fairbanks, AK 99701 Phone: (907) 452-8251 Fax: (907) 459-3851 Website: http://www.tananachiefs.org

History and Culture

Tanana was a traditional trading location for Alaskan Athabascans long before European contact. The community sits near the confluence of the Tanana and Yukon Rivers. In 1868, a French-Canadian fur trader named Francois Mercier established a trading post on the north bank of the Yukon about three miles below the confluence, where a part of the present community is still located. Several other trading posts were set up in the area by various companies, including the well-known Harper's Station, an Alaska Commercial Company Trading Post, 13 miles downriver from the present site, established in 1880. During these early years, both Protestant missionaries from the Anglican/Episcopal churches and Roman Catholic missionaries from Canada visited the area and ministered to the people. In 1881, Church of England missionaries from Canada built a mission eight miles downriver. Between 1887 and 1900, an elaborate school and hospital complex, the St. James Mission, was constructed. It became an important source of services and social change along both rivers.

In 1898, the U.S. Government founded Fort Gibbon military reserve near Tanana to maintain the section of telegraph line between Fairbanks and Nome. Tanana was an established trading post for the Koyukon

and Tanana people and an ideal location for the military for shipping supplies and trading in support of the mining activities. At the turn of the century, a post office and several other commercial enterprises were established. Gold seekers left the Yukon after 1906. In February 1908, a company of infantry from Fort Gibbon were sent to Fairbanks to help the U.S. Marshal maintain order during a miner's strike. The men traveled 155 miles by dog sled to Fairbanks.

During this time, Roman Catholic missionaries continued to visit Tanana, mostly ministering to the needs of Catholic soldiers, gold seekers and businessmen who had come into the area. Catholic missions had been established downriver at Nulato and (later) Louden, so Tanana became the borderline between the two Christian missionary efforts. Downriver remained predominantly Catholic, and upriver stayed Episcopalian, but Tanana was the only community with a continuing strong presence of both groups.

Although Fort Gibbon was an important hub and trading post for miners, many miners were leaving the Yukon as early as 1906. The fort was part of the Washington-Alaska Military Cable and Telegraph System, which was then part of wireless radio communications, which eventually made the telegraph service obsolete. Fort Gibbon was abandoned in 1923; however, it was used as a temporary air base refueling stop during World War I.

The St. James Hospital was transferred to the Bureau of Indian Affairs administration in the 1920s. New hospital facilities were built in 1949. During the 1950s, hospital administration was transferred to the U.S. Public Health Service.

The Tanana Tribe was federally recognized in 1939 under the Indian Reorganization Act, but the tribal government was not ratified by the people until April 1947. The City of Tanana was incorporated under the State of Alaska in 1961. The hospital complex was a major employer during this period, employing 54 persons with a payroll of $1.6 million, but it closed in 1982. That same year, Tanana incorporated as a first-class city in order to assume control of the local school system. The hospital facilities were remodeled for use as a health clinic, counseling center, tribal office, and regional elders' residence. The old main hospital building was torn down in 2010.

Population

According to the 2016 U.S. Department of Labor Estimate, Tanana has a population of 224 residents, with 87% being Alaska Native (Figure 2). Figure 2 provides historical census population data. The community has a total of 136 housing units, and 100 units are occupied. A total of 36 housing units are vacant.

Economy

Tanana's economy is based on subsistence and supplemented by local government employment.

The total potential work force provided by the Department of Labor Division of Research and Analysis in 2016 was 183; 128 residents were employed. The unemployment rate provided in the 2013 State of Alaska HMP is 24% although practical unemployment or underemployment is likely to be significantly higher. Approximately 13% of residents live below the poverty line. The per capita income is $20,250 with a median household income of $45,000.

Local government is the main industry providing employment to residents of Tanana, which is 70 percent of the jobs. The majority of the workers are employed by the City, NVT, or the Maudrey J. Sommer School District. Seasonal jobs include BLM firefighting, trapping, wood cutting, and construction.

The City employs some individuals to gather and to cut wood for use in the biomass systems, wood boiler installers and operators, forestry management and engineering biomass systems. In 2017, about 312 cords of wood (fuel equivalent of 46,800 gallons) per year has been harvested from the Yukon River. Annually, the community burns about 400 cords of wood for residential heating.

Tozitna, Limited, the village corporation for Tanana, runs a gas station and fuel delivery. Another private business also has retail gas sales.

Most of the Tanana residents maintain their subsistence lifestyles—hunting, fishing, and harvesting wild berries for food.

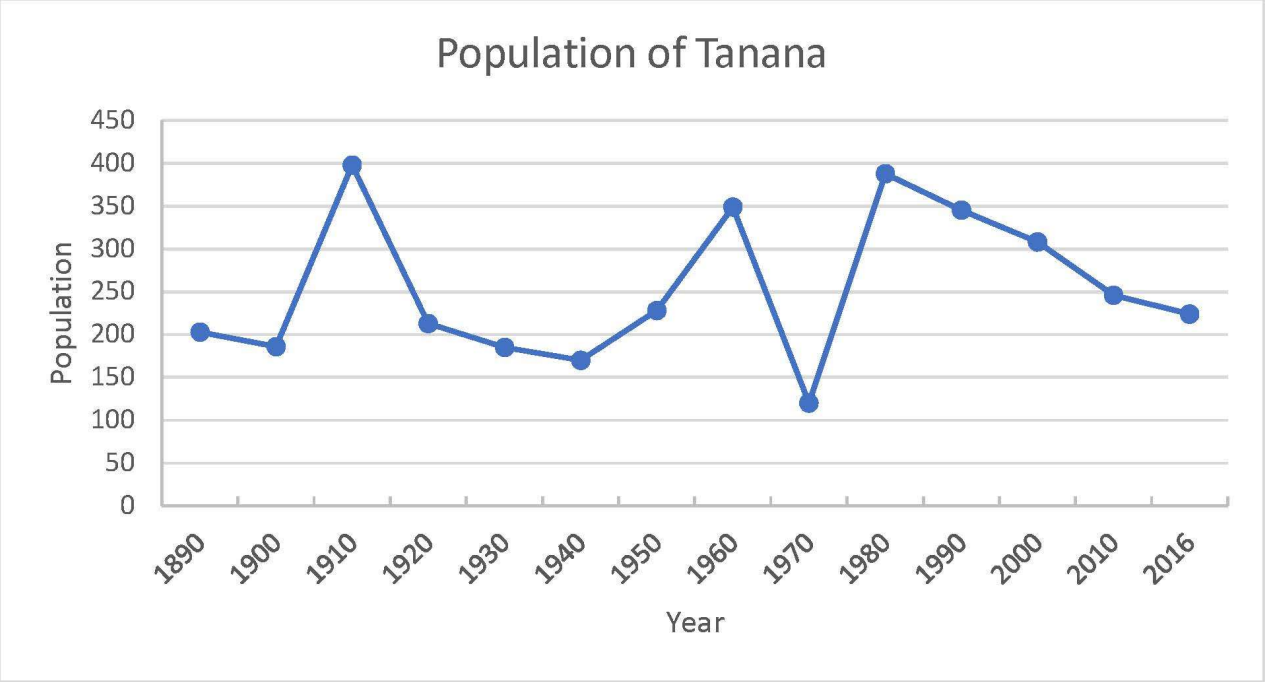


Figure 2. Historical Population

Facilities

The City of Tanana has a water treatment plant, and some haul their own water. Wastewater is collected through a gravity-fed sewer system, and refuse is taken to the local landfill.

Tanana Power Company, Inc. operates a diesel-powered generator.

Maudrey J. Sommer School, a kindergarten through 12th grade with 36 students and 4 teachers in 2016, is located within the Tanana City School District.

The Tanana Health Center is an entity of the Tanana Chiefs Conference healthcare facility and is operated by the Native Village of Tanana.

The City of Tanana has an Army Corps of Engineers' (USACE) permit to extract gravel from the river beach during the winter season.

Climate

Tanana experiences a cold, continental climate with temperature extremes. Daily maximum temperatures during July range from 49°Fahrenheit (°F) to 71°F and daily minimum temperatures during January are -3°F to -18°F. Extreme temperatures have been measured from -76°F to 94 °F. The average annual rainfall is 12 inches and average annual snowfall is 47 inches. This is based on data from 1949 to 2012. The highest rainfall year was in 1965 when approximately 24 inches fell. The lowest rainfall was in 2007 when only approximately 3 inches were recorded. In 1955, the record snowfall was approximately 119 inches. The river is ice-free from mid-May through mid-October.

Soils

The west side of Tanana has good gravel, which allows for building slab on grade and basement foundation systems that are not affected by permafrost. Other portions of the area have less desirable soils for building.

Wildlife

Wildlife in the area surrounding Tanana is abundant. Black bears, brown bears, wolves, wolverines, moose, and waterfowl are all present within the Tanana area. The broad flood plains of the Yukon and Tanana Rivers in the Interior are the most productive of all Alaska waterfowl habitats.

2.2 Tanana Capability Assessment

Government

Tanana is located in an unorganized borough. The City of Tanana was incorporated in 1961. The community has a "manager" form of government. The City Council has seven members that meet the second Wednesday of every month. Regular elections are held on the first Tuesday in October. The city imposes a 2% sales tax.

Community Maps

Community maps were developed using data from the DCRA website and input from residents. Map 1 provides a regional view of Tanana. Maps 2 and 3 provide an aerial view of Tanana.

Infrastructure

Every jurisdiction is unique. The list of assets that are most important to protect, as well as the criticality of any given facility, can vary widely from community to community. For planning purposes, a jurisdiction should determine criticality based on the relative importance of its various assets for the delivery of vital services, the protection of special populations, and other important functions. Infrastructure may be considered critical for a variety of reasons.

Critical Facilities: Critical facilities are those facilities and infrastructure necessary for emergency response efforts and whose loss of function would present an immediate threat to life, public health, and safety. In Tanana, they include:

- Maudrey J. Sommers K-12 School and School Gym serve as the community shelter.
- Roads
- Communications
- Utilities
- Ralph M. Calhoun Memorial Airport
- Tanana Tribal Council Community Hall
- Tanana Community Hall
- Tanana Fire Department
- Tanana Police Department
- DOT Maintenance Shop
- City Maintenance Shop
- Ralph M. Calhoun Memorial—Construction Snow Removal Equipment Building
- Fuel Storage facilities

Essential Facilities: Essential facilities are those facilities and infrastructure that supplement response efforts and whose loss of function would present an immediate threat to life, public health, and safety, including:

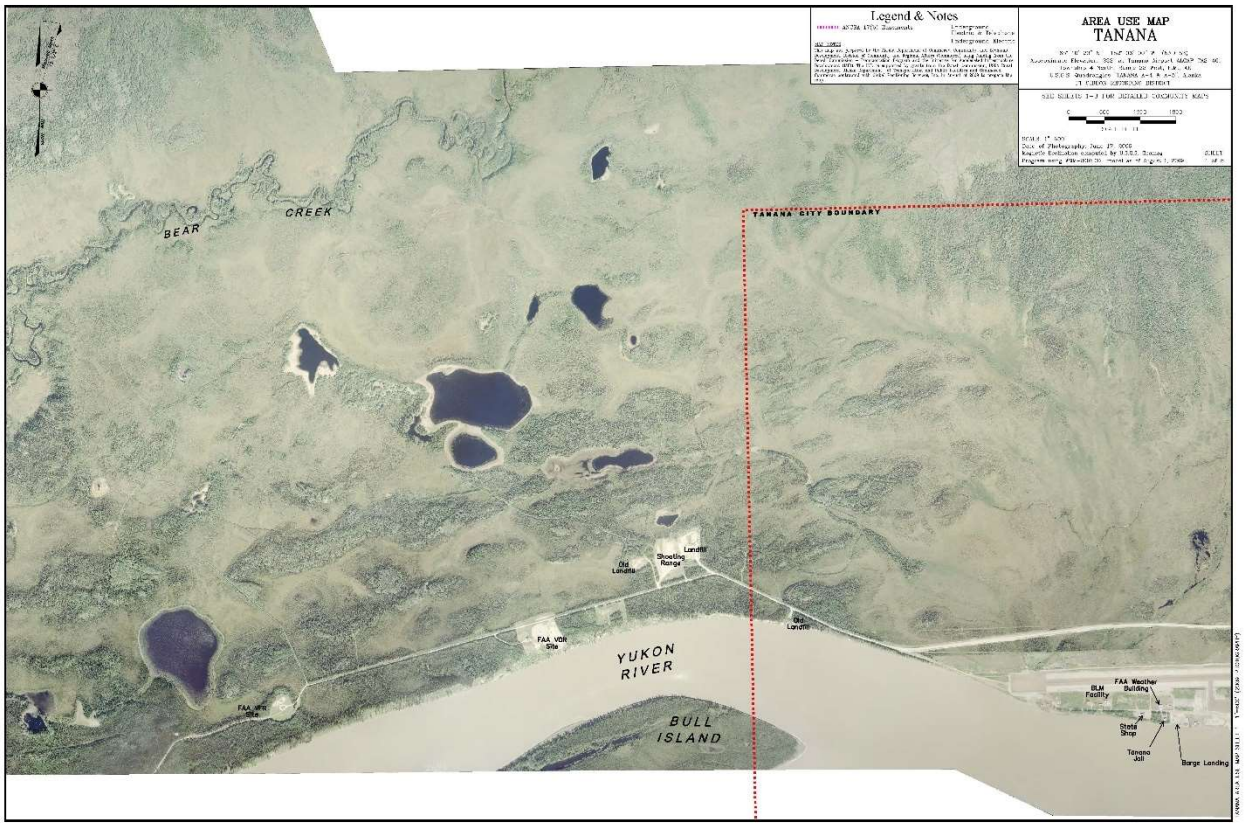
- Tanana Tribal Health Center

Map 1. Regional Map

Critical Infrastructure: Critical infrastructure consists of the various service networks in Tanana, including:

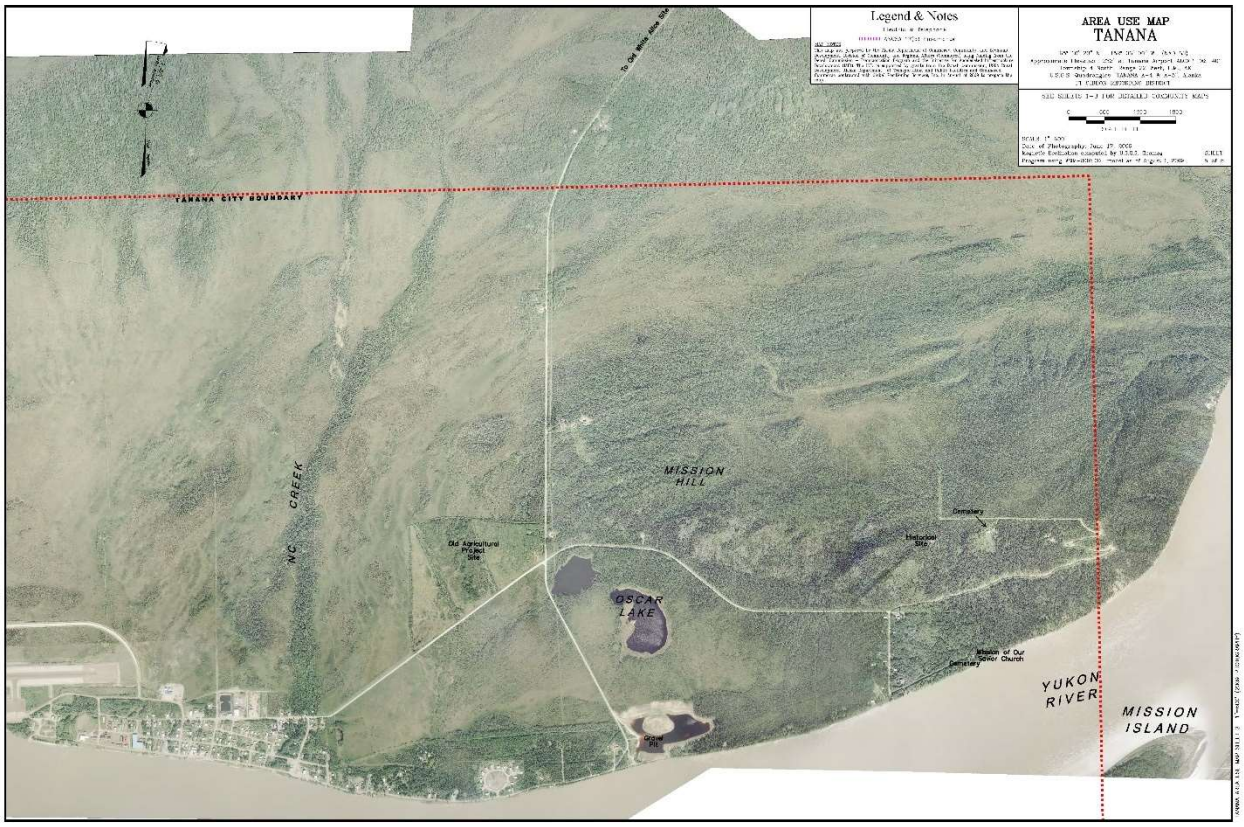
- Yukon Telephone Company facilities
- AT&T Alascom facilities
- GCI facilities
- Supervisions Cable ISP facilities
- TV station facilities
- Too'gha water and sewer facilities
- Piped water & sewer system that serves the Tanana Clinic, Regional Elders' Home, Tribal Council Building, Washeteria, and Water Treatment Plant
- Alternative Energy Center

Map 2. Aerial of Tanana (East)



Source: DCRA Community Profile Imagery

Map 3. Aerial of Tanana (West)



Source: DCRA Community Profile Imagery

Vulnerable Populations: Locations within Tanana that serve populations with special needs or require special consideration include:

- Maudrey J. Sommers K-12 School and School Gym
- Tanana Tribal Health Clinic
- Tanana Tribal Council/Elders' Home: Dina'Dilna'Kka'Ya

Cultural and Historical Assets: Cultural and historical assets include those facilities that augment or help define community character that, if lost, would represent a significant loss to the community. These include:

- Tanana Mission, also known as Mission of Our Savior Episcopal Church and Cemetery
- Community Cemetery
- St. James Episcopal Mission
- St. Aloysius Catholic Church

2.3 Local Resources

Tanana is a small community with a limited number of planning and land management tools. The resources available in these areas have been assessed by the City and NVT, and are summarized in Tables 3-5.

The City and NVT Council depend upon any available government and private grants for much of their mitigation projects. With an approved MJHMP, sovereign tribes, such as NVT, may apply directly to FEMA for grants or apply through the State. If a Tribe applies to the State for FEMA mitigation grants, the State may pay the required matching funds.

Table 3. City and NVT Legal and Technical Capability

Regulatory Tools (ordinances, codes, plans)	City Local Authority (Yes/No)	Tribal Local Authority (Yes/No)	Comments (Year of most recent update; problems administering it, etc.)
Building code	No	No	
Zoning ordinance	No	No	
Subdivision ordinance or regulations	No	No	
Special purpose ordinances (floodplain management, stormwater management, hillside or steep slope ordinances, wildfire ordinances, hazard setback requirements)	No	No	
Growth management ordinances (also called “smart growth” or anti-sprawl programs)	No	No	
Site plan review requirements	No	Environmental Review	
Comprehensive plan	No	Yes	
A capital improvements plan	Yes	No	
An economic development plan	Yes	No	
An emergency response plan	Yes	Fire & Flood only	
A post-disaster recovery plan	No	No	
Real estate disclosure requirements	No	No	

Table 4. City and NVT Administrative and Technical Capability

Staff/Personnel Resources	Y/N	Department/Agency and Position
City Manager	Y	Jeff Weltzin (City)
Tribal Executive Director	Y	Shannon Erhart (Tribe)
City Clerk	Y	Dorothy Jordan (City)
Health Officer	Y	Tanana Chiefs Conference (Tribe)
Tribal Planner	N	
Public Works Director	Y	Patrick Moore (City)
Public Safety Director	N	
Librarian	N	
Police Officer	N	Interviewing currently for VPSO
Fire Chief	Y	Clint Wiehl (City)
Fire Department	Y	Volunteer
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	N	
Planners or Engineer(s) with an understanding of natural and/or human-caused hazards	N	
Floodplain manager	N	
Surveyors	N	
Staff with education or expertise to assess the community's vulnerability to hazards	N	
Personnel skilled in GIS and/or HAZUS	N	

Table 5. City and NVT Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Yes or No)
Community Development Block Grants (CDBG)	Yes -Both
Capital improvements project funding	Yes – City
Authority to levy taxes for specific purposes	Y – City
Fees for sewer	Y – City
Impact fees for homebuyers or developers for new developments/homes	N
Incur debt through general obligation bonds	N
Incur debt through special tax and revenue bonds	N
Incur debt through private activity bonds	N
Withhold spending in hazard-prone areas	N

2.4 Hazard Mitigation Funding Resources

State Mitigation Funding

Direct State Disaster Mitigation Funding

While the State of Alaska has PA and IA programs under State-declared disasters, it does not have a State disaster mitigation program. However, there have been a few occasions in which the Governor and/or Legislature have elected to identify and fund mitigation work through the State Disaster Relief Fund (DRF). These actions were taken under discretionary authority, and no permanent State mitigation program was established.

State Provision of Non-Federal Match to Federal Mitigation Programs

Many federal mitigation programs require a local match of non-federal funds. The match required varies with the program regulations and community being granted funds. There are several mitigation programs in which the State of Alaska may provide the entire non-federal match for local communities resulting in 100% funds being granted to the community for mitigation. These programs, described in detail below, include the Public Assistance (also called 406 mitigation) and HMGP which are funded under federally-declared disasters. The matching funds are paid through the State DRF. Therefore, while these programs are listed below under "Federal mitigation programs" for convenience, the State provides substantial funding for these programs, sometimes in the millions of dollars. On occasion, the State has likewise provided a portion of the non-Federal match for National Resource Conservation Service (NRCS) projects.

State of Alaska Supporting Mitigation Programs

Division of Homeland Security and Emergency Management Disaster Relief Fund

The State of Alaska provides State funding for PA and IA in State-declared disasters and cost share funds for federally-declared disasters through the DRF.

Department of Commerce, Community & Economic Development

Community Development Block Grants

These grants fund community projects and planning activities improving health, safety, and essential community services.

Alaska Regional Development Organizations

The Alaska Regional Development Organizations (ARDORs) fund cooperative economic development.

Rural Development Assistance Mini-Grants

These grants partially fund plan development, feasibility engineering studies, and capital projects. Mini-grants are awarded by the State Legislature.

Unincorporated Community Grants

These grants are awarded by the State Legislature to unincorporated communities and nonprofits for a

wide range of projects and programs.

Federal Mitigation Funding

There are several Federal agencies and programs funding mitigation projects in the State of Alaska. Mitigation grants are administered through the DHS&EM as the grantee to local communities functioning as sub-grantees with the State providing the required matching funds for HMGP. Table 6 is an overview of grant programs and their eligible programs.

Table 6. FEMA 2013 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 administers HMA grants through Congressional authorization of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 2000 as amended. While many features of the HMA grants overlap, such as the benefit cost analysis (BCA) requirement, each grant program has specific features. Detailed guidance for these grants is provided by FEMA at

http://www.fema.gov/library/viewRecord.do?id=3649.

Federal Disaster Mitigation Grants

406 Public Assistance Mitigation

FEMA PA repair projects are eligible for additional mitigation funds through 406 PA mitigation. Section 406 of the Stafford Act stipulates the mitigation project must relate directly to the disaster damages.

Hazard Mitigation Grant Program

In contrast, whenever there is a presidentially-declared disaster in the State of Alaska, FEMA offers mitigation grant funds based on a percentage of the overall Federal share of disaster costs (15% in 2013). This program, called the HMGP, was created in 1988 by the Stafford Act, Section 404 (404 mitigation) and allows HMGP funds to be used anywhere in the State if it is stipulated in the State disaster declaration to the President. While HMGP is funded through a presidentially-declared disaster, HMGP funds are not used to repair disaster damage but to reduce future disaster losses through mitigation projects and planning.

Federal Unmet Needs Program

Unmet Needs is a program activated in specific disasters based upon a Congressional determination there are unmet needs following a disaster. Mitigation funds may be available for jurisdictions receiving an unmet needs allocation. Mitigation projects are specified in the Unmet Needs allocation. The Unmet Needs program funds up to 75% of an approved project.

Additional Primary Federal Mitigation Programs

FEMA

Pre-Disaster Mitigation Grant Program

The FEMA PDM grant program funds mitigation projects and planning for State, Local, and eligible Tribal organizations. The PDM program is annual, subject to Congressional appropriation, and nationally competitive. PDM sets aside a minimum monetary amount for each State and offers any remaining funds for national competition. Congress controls the PDM program and may award PDM funds in lieu of any competitive application process.

The State is the grantee of PDM funds and communities are the sub-grantees. Grant awards are a 75% Federal/25% applicant cost share match. Communities identified as “small and impoverished” are eligible for 90% Federal and 10% applicant match. The State of Alaska does not pay the applicant match for the PDM program.

Earthquake Hazards Reduction State Assistance Program

In 2012 and 2013, the State of Alaska received funds through the FEMA Earthquake Hazards Reduction State Assistance Program (EHRSAP). These funds were awarded through FEMA to States with earthquake hazards based upon specific Congressional authorization and are designed to support State earthquake program activities. Out of the total Congressional allocation, a portion of the funds are awarded to each state based upon a FEMA earthquake risk calculation. FEMA intends to continue this

program subject to Congressional appropriation. The State of Alaska has used EHRSAP funds to support earthquake active fault mapping and earthquake/tsunami education outreach displays. The SHMO manages and administers these funds.

Hazard Mitigation Technical Assistance Program

Through the Hazard Mitigation Technical Assistance Program (HMTAP), FEMA creates technical products for Federal, State, and local community use. FEMA administers HMTAP contracts with State advisement. HMTAPs continue to be a potential tool to accomplish specific, clearly-defined mitigation planning work as identified by the SHMO.

Department of Commerce National Oceanic and Atmospheric Administration (NOAA)

Remote Community Alert Systems Program

The Remote Community Alert Systems Program (RCASP) funds multi-hazard warning communication systems for remote communities with limited 911 services, cell phone access, and communications capability. Where appropriate, the State directly manages the project (Unincorporated community in the Unorganized Borough) or sub-grants the funds. To date, funds have been used to install multi-hazard community warning sirens. In Alaska, the RCASP is managed through the SHMO.

Small Business Administration

Business Physical Disaster Loans are available for businesses and non-profit organizations in the area of a declared Federal disaster or Small Business Administration (SBA) declared disaster. SBA often sends representatives on federally-declared disasters to present their disaster loan program.

Department of Agriculture

Natural Resource Conservation Service

Emergency Watershed Protection Program

The Natural Resource Conservation Service (NRCS) is responsible for the Emergency Watershed Protection (EWP) program. EWP provides financial and technical assistance to remove debris from streams, protect destabilized stream banks, establish cover on critically eroding lands, establish conservation practices, and purchase flood plain easements.

Department of Defense

U.S. Army Corps of Engineers

The USACE has accomplished many extensive hazard mitigation studies and projects in Alaska, including the 2009 Kivalina community seawall and the Chena River flood control project in the Fairbanks North Star Borough. Funding for USACE projects and studies is dependent on Congressional appropriation and program requirements.

Additional Federal Agencies

Department of Agriculture

U.S. Forest Service

Department of Commerce

National Oceanic & Atmospheric Administration – See above under RCASP

National Weather Service

Office of Coastal Resource Management

Department of Defense

USACE Army Corps of Engineers - National Flood Proofing Committee

Department of Health, Education & Welfare

Center for Disease Control (CDC)

Department of Housing & Urban Development

Community Development Block Grant

HOME Investment Partnerships Program

Department of the Interior

U.S. Geological Survey

U.S. Fish & Wildlife Service

Bureau of Land Management

Bureau of Indian Affairs

Environmental Protection Agency

Department of Transportation

Federal Highway Administration

Federal Aviation Administration

National Trust for Historic Preservation

Additional Mitigation Grant Resources

Information about other grant programs may be found in these sources:

- FEMA Disaster Assistance: A Guide to Recovery Programs

Chapter 3. Risk Assessment

3.1 Requirements

> Section 201.6(c)(2) of the mitigation planning regulation requires local jurisdictions to provide sufficient hazard and risk information from which to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. (FEMA 386-8)

The goal of mitigation is to reduce the future impacts of a hazard including loss of life, property damage, and disruption to local and regional economies, environmental damage and disruption, and the amount of public and private funds spent to assist with recovery. Mitigation efforts begin with a comprehensive risk assessment. A risk assessment measures the potential loss from a disaster event caused by an existing hazard by evaluating the vulnerability of buildings, infrastructure, and people. It identifies the characteristics and potential consequences of hazards and their impact on community assets.

Federal regulations for HMPs outlined in 44 CFR Section §201.6(c)(2) include a requirement for a risk assessment. This risk assessment requirement is intended to provide information that will help the community identify and prioritize mitigation activities that will prevent or reduce losses from the identified hazards. The federal criteria for risk assessments and information on how the Tanana MJHMP meets those criteria are outlined below

Table 7. Risk Assessment - Federal Requirements

Section §201.6(c)(2) Requirement	Where requirement is addressed in Tanana Multi-Jurisdictional Hazard Mitigation Plan
Identifying Hazards §201.6(c)(2)(i) The risk assessment *shall* include a description of the type . . . of all natural hazards that can affect the jurisdiction . . .	Chapter 3, Section 4 identifies flood; Chapter 3, Section 5 identifies wildland and conflagration fire; Chapter 3, Section 6 identifies earthquake; Chapter 3, Section 7 identifies severe weather; Chapter 3, Section 8 identifies technological; and Chapter 3, Section 9 identifies climate change as the natural hazards with the potential to be present in Tanana. Chapter 3, Section 10 discusses all potential natural hazards not included in this Plan Update and the rationale for not including them.

Section §201.6(c)(2) Requirement	Where requirement is addressed in Tanana Multi-Jurisdictional Hazard Mitigation Plan
Profiling Hazards §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.	Chapter 3, Sections 4-9 include hazard-specific sections of the Tanana MJHMP profile and describe how the natural hazards have the potential to affect the community. The Plan includes **location, extent, impact,** and **probability** for each natural hazard identified. The MJHMP also provides hazard specific information on **previous occurrences** of hazard events.
Assessing Vulnerability: Overview §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.	Chapter 3, Section 2 contains an overall summary of each hazard and its impacts on the community. Summaries are contained in hazard-specific sections in Chapter 3. City of Tanana and the NVT's risks are identical and do not vary.
Assessing Vulnerability: Addressing Repetitive Loss Properties §201.6(c)(2)(ii) The risk assessment in all plans approved after October 1, 2008 must also address NFIP-insured structures that have been repetitively damaged by floods.	Tanana does not participate in the NFIP.
Assessing Vulnerability: Identifying Structures §201.6(c)(2)(ii)(A) The plan *should* describe vulnerability in terms of the types and number of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.	Chapter 3, Section 2, Table 13 lists structures, infrastructure, and critical facilities located in the identified hazard areas.

Section §201.6(c)(2) Requirement	Where requirement is addressed in Tanana Multi-Jurisdictional Hazard Mitigation Plan
Assessing Vulnerability: Estimating Potential Losses §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.	Chapter 3, Section 2, Table 14 estimates potential dollar losses to City-owned and Tribal-owned facilities that are known. Some values are unknown.
Assessing Vulnerability: Land Uses and Development Trends §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.	Chapter 3, pages 42 and 43 contain this information.

3.2 Vulnerability Assessment Methodology

The purpose of a vulnerability assessment is to identify the assets of a community that are susceptible to damage should a hazard incident occur.

Critical facilities are described in the Community Profile Section (Chapter 2) of this hazard plan. A vulnerability matrix table of critical facilities as affected by each hazard is provided in Tables 13 and 14.

Facilities were designated as critical if they are: (1) vulnerable due to the type of occupant (children or elderly for example); (2) critical to the community's ability to function (roads, power generation facilities, water treatment facilities, etc.); (3) have a historic value to the community (cemetery); or (4) critical to the community in the event of a hazard occurring (emergency shelter, etc.).

This MJHMP includes an inventory of critical facilities from Tanana records.

The following assessment includes the following sections:

Section 1. Identifying Hazards

Section 2. Assessing Vulnerability: Overview and Potential Losses

Section 3. Risk Analysis

Section 4. Flood

Section 5. Wildland Fire and Conflagration Fire

Section 6. Earthquake

Section 7. Severe Weather

Section 8. Technological

Section 9. Climate Change

Section 10. Hazards Not Profiled in the 2017 Tanana MJHMP

The description of each of the identified hazards includes a narrative, and, in some cases, a map of the following information:

The **location** or geographical areas in the community that would be affected.

The location of identified hazards is described by a map wherever appropriate or in some cases with a narrative statement.

The **extent** (i.e. magnitude or severity) of potential hazard events is determined.

The following table is used to rank the extent of each hazard. Sources of information to determine the extent include the 2013 *Alaska All-Hazard Risk Mitigation Plan,* historical or previous occurrences, and information from the location of the hazard.

Table 8. Extent of Hazard Ranking

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

The **impact** of the hazard or its potential effects on the community is described.

The **probability** of the likelihood that the hazard event would occur in an area.

The following table, taken from the 2013 *Alaska All-Hazard Risk Mitigation Plan*, categorizes the probability of a hazard occurring. Sources of information to determine the probability include the 2013 *Alaska All-Hazard Risk Mitigation Plan*, historical or previous occurrences, and information from the location of the hazard.

Table 9. Probability Criteria Table

Probability	Criteria
4 - Highly Likely	Event is probable within the calendar year. Event has up to 1 in 1 year's 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 year's 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 year's 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 year's chance of occurring (1/10=10 percent). History of events is less than or equal to 10 percent likely per year. Event is "Unlikely" but is possible of occurring.

The **previous occurrences** of natural events are described for identified natural hazards. The information was obtained from the 2013 *Alaska All-Hazard Risk Mitigation Plan,* 2016 State Disaster Cost Index, City records, other state and federal agency reports, newspaper articles, web searches, etc.

Section 1. Identifying Hazards

This section identifies and describes the hazards likely to affect Tanana. The community used the following sources to identify the hazards present in the community: the 2013 *Alaska All-Hazard Risk Mitigation Plan*, interviews with experts and long-time residents, and previous occurrences of events.

Table 10 is taken from the2013 *Alaska All-Hazard Risk Mitigation Plan.* Data for Table 11, the Previous Occurrences Matrix, comes from the DHS&EM Disaster Cost Index, including data from 1978 to the 2016 and major events such as the 1964 earthquake. It may not include events known to the community or from other sources discussed in the sections describing specific hazards. This table refers to the Yukon-Koyukuk Regional Educational Attendant Area (REAA), a relatively large area, so not all hazards listed as being present necessarily affect Tanana. For example, while avalanche is listed as present, it does not occur within Tanana.

Table 10. Hazard Matrix

Hazard Matrix – Yukon-Koyukuk REAA				
Flood	**Wildland Fire**	**Earthquake**	**Volcano**	**Avalanche**
Y-H	Y-M	Y – L	N	Y-L
Severe Weather	**Ground Failure**	**Erosion**	**Tsunami & Seiche**	
Y-M	Y-L	Y-M	N	

Source:* 2013 *Alaska All-Hazard Risk Mitigation Plan

Hazard Identification:

Y: Hazard is present in jurisdiction but probability unknown

Y-L: Hazard is present with a low probability of occurrence within the next ten years. Event has up to 1 in 10 year's chance of occurring.

Y-M: Hazard is present with a moderate probability of occurrence within the next three years. Event has up to 1 in 3 year's chance of occurring.

Y-H: Hazard is present with a high probability of occurrence within the next one year. Event has up to 1 in 1 year's chance of occurring.

N: Hazard is not present

Table 11. Previous Occurrences of Hazards from 1978 to Present

Previous Occurrences – Yukon-Koyukuk REAA				
Flood	**Wildland Fire**	**Earthquake**	**Volcano**	**Avalanche** 0
2 - L	1 - L	0	0	
Tsunami & Seiche	**Severe Weather**	**Ground Failure**	**Erosion**	
0	3 - L	2 - L	0	

Source: **2013 *Alaska All-Hazard Risk Mitigation Plan***

Identification of Natural Hazards Present in Tanana

Based on consultation with the Alaska DHS&EM, Tables 10 and 11 from the 2013 *Alaska All-Hazard Risk Mitigation Plan*, Tanana plans and reports and interviews, Tanana community members identified the following hazards to be profiled.

Table 12. Hazards Identification and Decision to Profile

Hazard	Yes/No	Decision to Profile Hazard
Flood	Yes	Designated as a hazard in the 2013 *Alaska All-Hazard Risk Mitigation Plan*.
Wildland Fire	Yes	Designated as a hazard in the 2013 *Alaska All-Hazard Risk Mitigation Plan*.
Earthquake	Yes	Designated as a hazard in the2013 *Alaska All-Hazard Risk Mitigation Plan*.
Volcano	No	Hazard is designated as not present in the 2013 *Alaska All-Hazard Risk Mitigation Plan*; no notable volcano or ashfall events were found; community members did not consider volcanoes a hazard to their community.
Avalanche	No	Hazard is designated as not present in the 2013 *Alaska All-Hazard Risk Mitigation Plan*; the community is located away from avalanche areas.
Tsunami & Seiche	No	Hazard is designated as not present in the 2013 *Alaska All-Hazard Risk Mitigation Plan*; the community is located away from the coastline.

Hazard	Yes/No	Decision to Profile Hazard
Severe Weather	Yes	Designated as a hazard in the 2013 *Alaska All-Hazard Risk Mitigation Plan*.
Ground Failure (Permafrost)	No	Designated as a hazard in the 2013 *Alaska All-Hazard Risk Mitigation Plan*; however, Tanana is situated on a deep gravelly area, which is not conducive to the effects of permafrost.
Erosion	No	Designated as a hazard in the 2013 Alaska *All-Hazard Risk Mitigation Plan*; however, the only observable erosion is downriver of the City of Tanana, and the City and NVT have chosen not to profile this hazard.
Technological	Yes	This hazard profile was added in 2017.
Climate Change	Yes	This hazard profile was added in 2017.

See Section 10, Hazards not present in Tanana, for more information on the hazards not present in the community. Each hazard that is present in the community is profiled in hazard-specific sections.

Section 2. Assessing Vulnerability

Overview

The vulnerability overview section is a summary of Tanana's vulnerability to the hazards identified in Table 12. The summary includes types of hazard, the types of structures, infrastructures, and critical facilities affected by the hazards.

Identification of Assets

The Hazard Vulnerability Matrix in Table 13 includes a list of critical facilities and essential infrastructure in Tanana, and whether, based on its location, each has a low, moderate, or high vulnerability to specific natural hazards. Flood is designated as FL, wildland fire as WF, earthquake as EQ, severe weather as SW, and climate change as CC.

Table 13. Tanana Community Asset Matrix – Critical Facilities and Essential Infrastructure

ID #	Facility	Location	FL	WF	EQ	SW	CC
Essential Facilities							
EF-1	Tanana Tribal Council	65.102 N, 152.046 W	L	H	L	M	L-M
EF-2	Tanana Tribal Health Center	65.102 N, 152.053 W	L	H	L	M	L-M
EF-3	Tanana Tribal EMS facilities	65.102 N, 152.053 W	L	H	L	M	L-M
EF-4	Tanana Police Department facilities	65.102 N, 152.042 W	L	H	L	M	L-M
EF-5	Tanana Fire Department	65.102 N, 152.042 W	L	H	L	M	L-M
EF-6	Tanana Tribal Council Community Hall	65.102 N, 152.046 W	M	H	L	M	L-M
EF-7	Tanana Tribal Council/Elders Residential Facility: Dina'Dilna'Kka'Ya	65.102 N, 152.056 W	L	H	L	M	L-M
EF-10	Maudry J. Sommers K-12 School and School Gym	65.102 N, 152.052 W	L	H	L	M	L-M
EF-11	Public/School Library	65.102 N, 152.056 W	L	H	L	M	L-M
EF-12	Ralph M Calhoun Memorial - Construction Snow Removal	65.204 N, 152.313 W State's shop at the Airport	L	H	L	M	L-M

ID #	Facility	Location	FL	WF	EQ	SW	CC
	Equipment Building						
EF-13	Rural Teacher Housing New Duplex	65.102 N, 152.051 W Front Street near school	L	H	L	M	L-M
EF-14	Teacher Housing	65.102 N, 152.051 W 3rd Street near the power plant	L	H	L	M	L-M
EF-15	Tanana Fire Station	65.102 N, 152.042 W 52 Park	L	H	L	M	L-M
EF-16	City Shop	3rd Street near bulk fuel plant	L	H	L	M	L-M
EF-17	National Weather Service Building	65.204 N, 152.313 W Calhoun Airport	L	H	L	M	L-M
EF-18	Tanana Mission, aka Mission of Our Savior Episcopal Church and Cemetery	65.101 N, 152.022 W	L	H	L	M	L-M
EF-19	Community Cemetery	65.170 N,-152.041 W Flooded near Circle Subdivision on east side of town upriver	L	H	L	M	L-M
EF-20	St. James Episcopal Mission	65.101 N, 152.049 W	L	H	L	M	L-M
EF-21	Tanana Commercial Store and U.S. Post Office	65.170 N, 152.082 W	L	H	L	M	L-M
EF-22	Tanana Commercial Gas	65.170 N, 152.082 W	L	H	L	M	L-M
EF-23	City Park	65.103 N, 152.061 W	L	H	L	M	L-M
EF-24	St. Aloysius Catholic Church	Upriver from dock area east end of airport	L	H	L	M	L-M
EF-25	Tanana Community Hall	65.169 N,152.069 W Front Street	L	H	L	M	L-M
EF-26	Tanana Teen Center	65.169 N,152.069 W across from Community Hall on Front Street	L	H	L	M	L-M
EF-27	Tanana Counseling Center	Tribal Council Compound	L	H	L	M	L-M

ID #	Facility	Location	FL	WF	EQ	SW	CC
Transportation							
TI-1	Ralph M. Calhoun Memorial Airport, 4,400' long by 150' wide lighted gravel runway	65.204 N, 152.313 W	M	H	L	M	L-M
TI-2	32 miles of local roads	Various locations	M	H	L	M	L-M
TI-3	Dock staging and storage area on Yukon River	65.204 N, 152.313 W Across from National Weather Service building	H	H	L	M	L-M
TI-4	Marine header	Front Street and Garden Street	H	H	L	M	L-M
TI-5	Tozitna Gas Retail	65.051 N, 152.102 W	H	H	L	M	L-M
TI-6	Tanana Commercial Gas	65.170 N,152.082; across from Tanana Commercial Store	H	H	L	M	L-M
TI-7	Elliott Hwy: Dalton Hwy To Tanana River near Manly Hot Springs	Residents use snowmachines to the road in winter; in summer use boats to get to highway or go upriver to Tanana River Bridge and take Dalton Highway	H	H	L	M	L-M
Utilities							
U-1	Yukon Telephone Co. facilities	65.172 N, 152.077 W Building; internet phone off Starband internet dish; 3rd and School Street	L	H	L	M	L-M
U-2	AT&T Alascom facilities	65.172 N, 152.077 W Garden Street; building and dish	L	H	L	M	L-M
U-3	GCI facilities	65.172 N, 152.077 W Cell phone tower on 3rd and School Street	L	H	L	M	L-M
U-4	Supervisions Cable ISP facilities	65.172 N, 152.077 W	L	H	L	M	L-M
U-5	ARCS TV station facilities	65.172 N, 152.077 W	L	H	L	M	L-M
U-6	Supervisions Cable TV facilities	65.172 N, 152.077 W	L	H	L	M	L-M

ID #	Facility	Location	FL	WF	EQ	SW	CC
U-7	Too'gha water and sewer facilities	65.173 N, 152.084 W Airport Road	M	H	L	M	L-M
U-8	Well #3 near the Yukon River	65.102 N, 152.047" W	M	H	L	M	L-M
U-9	Watering point #4	65.173 N, 152.084 W	L	H	L	M	L-M
NA	A piped water and sewer system serves the Tanana Hospital, clinic, regional elders' residence, and the tribal council building, washeteria and water treatment plant	Various locations	L	H	L	M	L-M
U-10	Landfill-incinerator and recycling services	65.107 N, 152.095 W	L	H	L	M	L-M
U-11	Sewage Lagoon	65.103 N, 152.045 W	L	H	L	M	L-M
U-12	Alternative Energy Center	65.173 N, 152.084 W Behind the washeteria (biomass systems, solar panels)	L	H	L	M	L-M
Hazardous Materials							
HM-1	Tanana City Bulk Fuel Storage Facility; 29,000 gallons	65.204 N, 152.313 W Directly behind utility company off 3rd Street	L	H	L	M	L-M
HM-2	Village Council Bulk Fuel; 65,500 gallons	65.204 N, 152.313 W	L	H	L	M	L-M
HM-3	Consolidated Bulk Fuel Facility	65.204 N, 152.313 W 7 tanks next to Yukon Telephone office building	L	H	L	M	L-M
HM-4	Power Plant Bulk Fuel; 112,500 gallons	65.204 N, 152.313 W	L	H	L	M	L-M
HM-5	School Bulk Fuel Tank; 25,000 gallons	65.204 N, 152.313 W	L	H	L	M	L-M

ID #	Facility	Location	FL	WF	EQ	SW	CC
HM-6	Maudry J. Sommers School on site; 6,000 gallons	65.102 N, 152.025 W	L	H	L	M	L-M
HM-7	Tank; 12,500 gallons	65.204 N, 152.313 W	L	H	L	M	L-M
HM-8	Village Safe Water; 12,500 gallons	65.173 N, 152.084 W	L	H	L	M	L-M
HM-9	ADOT&PF airport bulk fuel; 2,000 gallons	65.204 N, 152.313 W	L	H	L	M	L-M
HM-10	Tozitna Limited Corp. gas station; three 5,000-gallon fuel tanks and compressed propane storage	65.051 N, 152.102 W	M	H	L	M	L-M
High Loss Facilities							
HL-1	Too'gha water and sewer utilities	65.104 N, 152.050 W	M	H	L	M	L-M
HL-2	Tanana Bulk Fuel Storage Facility	65.204 N, 152.313 W	M	H	L	M	L-M
HL-3	Consolidated Bulk Fuel Facility	65.204 N, 152.313 W	M	H	L	M	L-M
HL-4	Power Plant and Bulk Fuel	65.204 N, 152.313 W	M	H	L	M	L-M
HL-5	School Bulk Fuel Tank	65.102 N, 152.052 W	L	H	L	M	L-M
HL-6	Maudry J. Sommers K-12 School	65.102 N, 152.052 W	L	H	L	M	L-M
HL-7	Tanana Tribal Council/Elders Residential Facility: Dina'Dilna'Kka'Ya	65.102 N, 152.056 W	L	H	L	M	L-M
HL-8	Ralph M. Calhoun Memorial Airport	65.204 N, 152.313 W	M	H	L	M	L-M

Table 14. Building Loss Estimate

#	Occupancy Class	Loss Estimate				
		Building Value	Building total	Contents % Value	Contents Total	Total
Residential						
136	Residential	$65,000 (median value) x 136	$8,840,000	50%	$4,420,000	$13,260,000
11	HUD residential houses	$180,000 x 11	$1,980,000	50%	$990,000	$2,970,000
4	Duplex	$600,000 x 4	$2,400,000	50%	$1,200,000	$3,600,000
1	Triplex	$1,000,000	$1,000,000	50%	$500,000	$1,500,000
1	Cold climate house	$250,000	$250,000	50%	$125,000	$375,000
1	Blue House*	$65,000	Unknown	100%	Unknown	$65,000
1	PA apartments*	$75,000	Unknown	100%	Unknown	$75,000
Commercial						
1	Commercial – Grocery Store/Post Office	$300,000	$300,000	100%	$300,000	$600,000
1	Commercial – Liquor Store	$131,442	$131,442	100%	$131,442	$262,884
1	Commercial – Gas Station	$75,000	$75,000	100%	$75,000	$150,000
1	Tozitna Limited Village Corporation Gas Station*	$75,000	$75,000	100%	$75,000	$150,000
Industrial						

#	Occupancy Class	Loss Estimate				
		Building Value	Building total	Contents % Value	Contents Total	Total
1	Too'gha Inc. water and sewer utility	$1,454,000	$1,454,000	150%	$1,454,000	$2,908,000[1]
1	Tanana Power Company	Unknown	Unknown	150%	Unknown	$1,200,000[2]
1	Alternative Energy Center	$281,385	$281,385	150%	$422,076	$703,463
1	Well House*	$65,000	Unknown	100%	Unknown	$65,000
1	Incinerator Building (Garage/Shop)*	$75,000	Unknown	100%	Unknown	$75,000
1	Movable Garage*	$35,000	Unknown	100%	Unknown	$35,000
Religious						
1	St. James Episcopal Church	$65,000	Unknown	100%	Unknown	Estimated
1	Mission of Our Savior Church and Cemetery	$65,000	Unknown	100%	Unknown	Estimated
1	St. Aloysius Catholic Church	$65,000	Unknown	100%	Unknown	Estimated
Government						
1	Ralph M. Calhoun Memorial Airport	$10,815,000	$10,815,000	150%	$16,222,500	$27,037,500
1	DOT Maintenance Shop	$803,082	$803,082	150%	$1,204,623	$2,007,705
1	National Weather Service Building	$3,000,000	$3,000,000	150%	Unknown	Estimated
1	City of Tanana Offices	$583,899	$583,899	150%	$875,849	$1,459,748

[1] State spent $10-20 million to build

[2] City's offer price to purchase from private owner

#	Occupancy Class	Loss Estimate				
		Building Value	Building total	Contents % Value	Contents Total	Total
1	City Shop	$869,859	$869,859	150%	$1,304,789	$2,174,648
1	City Fire Hall	$391,248	$391,248	150%	$586,872	$978,120
1	Public Safety Building	$708,903	$708,903	150%	$1,063,355	$1,772,258
1	Tanana Landfill	$90,201	$90,201	150%	$135,302	$135,302
1	City Cemetery	Unknown	Unknown	150%	Unknown	Unknown
1	Tanana Elders Home*	$3,500,000	$3,500,000	150%	Unknown	$3,500,000
1	Native Village of Tanana*	Unknown	Unknown	150%	Unknown	Unknown
1	Tanana Tribal Council Health Clinic*	$250,000	$250,000	150%	Unknown	Estimated
1	Consolidated Bulk Fuel Facility	$2,212,732	$2,212,732	150%	$3,319,098	$5,531,830
1	Green Building*	$65,000	Unknown	100%	Unknown	$65,000
1	Community Hall*	$50,000	Unknown	100%	Unknown	$50,000
Education						
1	Education – Maudry K. Sommers K-12 School, Gym, Public/School Library	$7,099,518	$7,099,518	100%	$7,099,518	$14,199,036
10	Education – Rural Teacher Housing Units	$231,357	$2,313,570	100%	$2,313,570	$4,627,140

Note: *Tribally-owned

Section 3. Risk Assessment Summaries

The planning team used the State's Critical Facility Inventory to identify critical facility locations in relation to a potential hazard's threat exposure and vulnerability (Table 15). The data was used to model an exposure assessment for each hazard where applicable.

Table 15. Critical Infrastructure in Alaska

Fire Stations	Airports	Community Cemeteries
Police Stations	Schools	Community Stores
Emergency Operations Centers	Telecommunications Structures & Facilities	Service Maintenance Facilities
Hospitals, Clinics, & Assisted Living Facilities	Satellite Facilities	Critical Bridges
Water & Waste Water Treatment Facilities	Community Washeterias	Radio Transmission Facilities
Fuel Storage Facilities	Harbors / Docks / Ports	Reservoirs & Water Supply Lines
Community Halls & Civic Centers	Landfills & Incinerators	National Guard Facilities
	Power Generation Facilities	Community Freezer Facilities
	Oil & Gas Pipeline Structures & Facilities	
	Any Designated Emergency Shelter	

Source: **2013, *State of Alaska Hazard Mitigation Plan***

A limited exposure analysis was conducted for each physical asset located within a hazard area with the available data. 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 casualty estimates were prepared.

The vulnerability estimates provided herein use the best data currently available, and are designed to approximate risk. Results are limited to the exposure of the built environment. It is beyond the scope of this MJHMP to estimate the range of injuries.

This analysis is an assessment of the community's risk to hazards without consideration of probability or level of damage.

Tables 16 and 17 list the infrastructure hazard vulnerability for Tanana.

Table 16. Vulnerability Overview for City of Tanana

Hazard	Percent of Tanana's Geographic area (%)	Percent of Population (%)	Percent of Building Stock (%)	Percent of Community Facilities and Utilities (%)
Flood	75	75	75	75
Wildland Fire	50	50	50	50
Earthquake	75	75	75	75
Severe Weather	50	50	50	50
Technological	50	50	50	50
Climate Change	25	25	25	25

Table 17. Vulnerability Overview for Native Village of Tanana

Hazard	Percent of Tanana's Geographic area (%)	Percent of Population (%)	Percent of Building Stock (%)	Percent of Community Facilities and Utilities (%)
Flood	75	75	75	75
Wildland Fire	50	50	50	50
Earthquake	75	75	75	75
Severe Weather	50	50	50	50
Technological	50	50	50	50
Climate Change	25	25	25	25

Asset Inventory

Table 13 identifies critical facilities and essential infrastructure in Tanana.

Potential Dollar Losses to Vulnerable Structures

Replacement values were known for some facilities/structures; however, there were quite a few facilities/structures where values were unknown. These are identified in Table 14.

Risk Assessment Summaries

Flood

Because the City of Tanana is located alongside the Tanana River, the potential for flooding throughout

the community is estimated at 75%. An abundant spring breakup could affect 75% of the population of Tanana, causing flooding. This includes 168 people in 75 occupied residences.

Wildland and Conflagration Fire

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

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

Approximately 50% of the community is estimated to be vulnerable to this risk. This includes 112 people in 50 occupied residences.

Earthquake

The community of Tanana and surrounding area may experience moderate earthquake ground movement sufficient to damage infrastructure. Although all structures are exposed to earthquakes, buildings constructed of wood exhibit more flexibility than those composed of unreinforced masonry.

Given its location, it is unlikely that an earthquake would be centered in an area around Tanana. Approximately 75% of the community is estimated to be vulnerable to this risk. This includes 168 people in 75 occupied residences.

Severe Weather

Approximately 50% of the community is estimated to be vulnerable to this risk. This includes 112 people in 50 occupied residences.

Technological

Approximately 50% of the community is estimated to be vulnerable to this risk. This includes 112 people in 50 occupied residences.

Climate Change

Per residents, approximately 25% of the community of Tanana, residential structures, and community facilities are vulnerable to climate change. This includes 56 people in 25 occupied residences.

NFIP and Repetitive Loss Properties

The community of Tanana does not participate in the NFIP.

Land Use and Development Trends

Land Ownership

Tozitna, the village corporation, and Doyon, Limited (Doyon), the regional corporation, own the majority of the lands within the community of Tanana. Doyon is the largest private landowner in Alaska. At the

time of the previous MJHMP, Tozitna was developing a subdivision of 15 home sites on 3rd Street. Presently, in 2017, Tozitna is still trying to develop the subdivision.

In 2007, the City submitted a formal proposal to Tozitna to convey lands to the City for future development under the Alaska Native Claims Settlement Act (ANCSA) Section 14 Land Claims, 14(c)(3). The City is now within a year of finalizing this settlement. From the State of Alaska DCRA website:

> ANCSA was enacted into law on December 18, 1971. This Act was intended to settle outstanding land claims and establish clear title to Alaska's land and resources. To do this, the Act established 12 regional corporations and a method of conveying surface estate (land) and subsurface estate (mineral and other resources) to each regional corporation. ANCSA also established village corporations and gave each village corporation, subject to valid existing rights, the right to the surface estate (land) in and around the village, as identified in Section 11 of the Act, as amended.

Some individuals own land in town in the Circle Subdivision and north of 3rd Street and in the upland areas of Mission Hill and White Alice Site Road.

Development Since Last Plan

The City of Tanana reinstituted the Planning and Zoning Commission for future development activities, such as subdivision approval and designating city streets; consolidating all school properties to one lot and block; and recording new legal descriptions and for developing legal descriptions and recording new lots for a subdivision of 15 homes that the NVT built.

Mitigation actions that have been implemented have decreased the overall vulnerability of hazards since the 2011 HMP. Approximately 50% of the *2011 City of Tanana, Alaska Preliminary Drainage Plan* and approximately 50% of the *2011 Community Wildlife Protection Plan* have been implemented. Improved drainage has reduced erosion and ponding/flooding of water, and reduced fuel has decreased the potential of a fire.

Biomass Wood Burning Systems

The City is converting more of its heating systems to biomass systems, using wood to reduce its dependence on heating oil. In 2007, the City built and installed the first biomass system that went online in 2008. Two years later, the system was upgraded to handle approximately 70% of the energy needs for the Washeteria and the Water Plant. The upgrade tied the biomass system directly into the oil-fired boilers, which resulted in a reduction of fuel consumption to 3,000 gallons of fuel per year. The City completed a new duplex for teacher housing and installed a biomass heating unit for the primary heat source. The City converted systems for the Maudry J. Sommer School, the City Shop, the Fire Station, the Washeteria, and Public Housing. As of 2017, there are four biomass systems in Tanana.

Proposed Road to Nome

The State of Alaska Department of Transportation and Public Facilities (DOT&PF) was planning to build a 500-mile road to Nome, and the proposed route would run through Tanana. A cost of $2.3 billion to $2.7 billion was estimated in 2010. DOT&PF was near completion of design and was in negotiations for

the right of way as of December 2013. The environmental documentation was complete, and permits were obtained. However, the State of Alaska's economic downturn has stalled work on the proposed road. It is uncertain if and when construction will begin.

Section 4. Flood

Hazard Description

A flood is the overflow of an expanse of water submerging normally dry land. Water defeats natural or artificial barriers protecting adjacent floodplains such as beaches, stream banks, and levees. Flooding is typically a natural event and considered a hazard only when people and property are at risk. Flooding is Alaska's most common disaster, costing the state in excess of one million dollars annually, major disruptions to society, and occasionally the loss of life.

Forms of Flooding

Tanana is susceptible to the following types of floods:

- Rainfall-Runoff
- Snowmelt
- Ice Jam

Rainfall-Runoff Flooding is the most common type of flooding in Alaska, typically occurring from late summer through the fall season. Rainfall intensity, duration, distribution, and geomorphic characteristics of the watershed all contribute to a flood's magnitude.

Snowmelt Floods typically occur from April through June. Snowpack depths, spring weather patterns, and geomorphic characteristics of the watershed determine the magnitude of flooding. Rainfall and melting glacial ice often exacerbate snowmelt floods.

Ice Jam Floods occur after an ice jam develops on a river or stream and blocks the path of flowing water. Ice jams may occur any time when ice is present but typically form during the following three seasons:

- Fall freeze up.
- Midwinter when stream channels freeze forming anchor ice.
- Spring breakup, when the existing ice cover weakens and breaks apart, flows downstream, and jams together at narrow sections of the stream channel.

Ice jams commonly develop in areas of decreased channel slope, shallow sections, or constrictions and frequently impede waterways during spring breakup.

The water level rises upstream behind the ice jam. If the ice jam is higher than the riverbank, the adjacent land will flood. The effect is analogous to a dam. There is usually little damage upstream of the jam unless a community development is nearby. In that situation, low-lying structures will be subject to significant flooding and ice impact.

When the stream breaches the ice jam, the water will drain rapidly and further damage structures as it flows back into its channel. The water level downstream will rise quickly and behave much like a flash flood, carrying large chunks of ice, trees, bank vegetation, and other debris. Ice jams were the cause of recent large and destructive floods along the Yukon rivers.

Location

Tanana experiences yearly spring breakup and snowmelt flooding.

Extent

A flood event could result in a **critical** situation in the community of Tanana. Flooding could cause injuries and/or illnesses resulting in potentially permanent disabilities, there could be complete shutdown of critical facilities for at least two weeks, if flooded, and more than 25% of property could be severely damaged because of Tanana's proximity to the Tanana and Yukon Rivers.

Impact

The impact on the community of Tanana from flooding could be extensive. Portions, if not all, of the community could be cut off from critical facilities, and infrastructure and services could be disrupted for an extended period during rebuilding.

Probability

Considering the community's proximity to the Tanana and Yukon Rivers and the damage from the 2009 Yukon River Spring Flood, the probability of flooding is **highly likely** for Tanana.

Previous Occurrences

The community of Tanana has experienced historic flood events. The May/June 2009 Yukon River flood impacted the community with losses in the millions of dollars. NVT received FEMA funding as a result of the 2009 flood, and they worked on road construction. Thirty-seven homes were either elevated or renovated from flood damage. Since the flood, some residents located within the flood plain have elevated their homes using their personal funds. Additionally, some residents would like their homes elevated above flood stage.

Table 18 proves information on past flood events, impacts, and estimated losses. Since the 2009 Yukon river flooding, no flood events have occurred.

Table 18. History of Flood Events

Date	Location and Extent	Impact	Estimated Loss
1937	Tanana River flood	High water elevation for 1937 flood mark on 1st Avenue; USACE floodplain study stated the highest flood level was recorded at 84.7 feet based on ground elevation.	unknown
1961	Not available; Tanana elder spoke of a flood during this year	unknown	unknown

Date	Location and Extent	Impact	Estimated Loss
May-June 2009	Yukon River spring flooding (DR-1843); largest disaster in Alaska in over 10 years; Kuskokwim and Yukon River systems.	Water inundation from ice jams and ballistic ice impacts from large ice chunks damaging structures and facilities; 37 homes damaged with 2 requiring major repairs; evacuation of 75 elders and children to Fairbanks because of flooded homes	$5.9 million in individual assistance funds; $1.1 million in Small Business Administration loans

Section 5. Wildland Fire and Conflagration Fire

Hazard Description

Wildland fires occur in every state in the country, and Alaska is no exception. Each year, between 600 and 800 wildland fires, mostly between March and October, burn across Alaska causing extensive damage.

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. In Alaska, the natural fire regime is characterized by a return interval of 50 to 200 years, depending on the vegetation type, topography, and location. The role of wildland fire as an essential ecological process and natural change agent has been incorporated into the fire management planning process, and the full range of fire management activities is exercised in Alaska to help achieve ecosystem sustainability, including its interrelated ecological, economic, and social consequences on firefighter and public safety and welfare, natural and cultural resources threatened, and the other values to be protected dictate the appropriate management response to the fire. Firefighter and public safety is always the first and overriding priority for all fire management activities.

Fires can be divided into the following categories:

Structure fires – originate in and burn a building, shelter, or other structure.

Prescribed fires - ignited under predetermined conditions to meet specific objectives, to mitigate risks to people and their communities, and/or to restore and maintain healthy, diverse ecological systems.

Wildland fire - any non-structure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Use - a wildland fire functioning in its natural ecological role and fulfilling land management objectives.

Wildland-Urban Interface Fires - fires that burn within the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. The potential exists in areas of wildland-urban interface for extremely dangerous and complex fire conditions, which pose a tremendous threat to public and firefighter safety.

Fuel, weather, and topography influence wildland fire behavior. Wildland fire behavior can be erratic and extreme causing firewhirls and firestorms that can endanger the lives of the firefighters trying to suppress the blaze. 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. Temperature and humidity also affect fire behavior. High temperatures and low humidity encourage fire activity while low temperatures and high humidity help retard fire behavior. Wind affects the speed and direction of a fire. Topography directs the movement of air, which can also affect fire behavior. When the terrain funnels air, like what happens in a canyon, it can lead to faster spreading. Fire can also travel up slope quicker than it goes down.

Wildland fire risk in Alaska has increased in recent years due to the spruce bark beetle infestation. Dead trees are very dry, and, therefore, highly flammable. This presents an even higher risk of fire in the

coming years as the trees fall, littering the forest floor with flammable material. Impacts common to wildland fires include structural damage from urban interface fires, ecological damage, and loss of subsistence resources. Fire events can also impair transportation to and from affected populations.

Tanana residents also spoke of impacts from smoke from fires within the Interior of the state. Although those wildland fires may be hundreds of miles from Tanana, winds can carry smoke into the community, affecting vulnerable populations at risk for asthma and other respiratory ailments.

In addition to wildland fires, this section includes community conflagrations (fires in the built environment). These fires can occur at any time and quickly spread from building to building. Impacts typical of community conflagrations include structural and smoke damage, as well as loss of the structures contents.

The 2011 *Tanana Community Wildfire Protection Plan (CWPP)* stated that risk of fires within the community are primarily human-caused, and the area of highest concern is open burning at the landfill and residences. The City purchased two incinerators for the landfill; however, some residents use burn barrels to dispose of Class A materials. Other hazards identified in the CWPP for fire are "the bulk fuel tank farms, heating fuel tanks around the residences, and numerous unabated residential properties lying within continuous fuel beds."

Location

Wildland and conflagration fires are Tanana's number one hazard concern in 2017. The hazard of a fire could severely impact Tanana. Many structures within the community are situated very close together, which would allow for a fire to spread quickly.

Extent

A wildland or conflagration fire event could result in a **critical** situation in Tanana. Injuries and/or illness could result from excessive smoke and cause a complete shutdown of critical facilities for at least two weeks with more than 25% of property severed damaged. Past historical data indicates that the area surrounding Tanana has seen numerous instances of wildland fire and/or conflagration fire.

Impact

Tanana residents must be fairly self-reliant because of the community's location, although it is within 130 air miles of Fairbanks. A fire event could leave community residents homeless and damage critical structures. Fires could also cause a severe air quality issue as the result of smoke. In 2015, the community of Tanana evacuated 100 people (elders and youth) to Fairbanks, where they stayed for three weeks due to the concern of air quality and how close the fire was getting to the city. No homes burned, but this event had a large impact on the Tanana community.

Probability

Based on historical information, the community of Tanana is located in an area of moderate hazard. Within 10 miles of Tanana, the potential for large fires impacting the community is also moderate. The following map from the 2013 Alaska *All-Hazard Risk Mitigation Plan* depicts Tanana as being in an area where wildland fire hazards are present but of an unknown probability. Per Table 9, a wildland fire is **possible**; however, the level of probability is unknown.

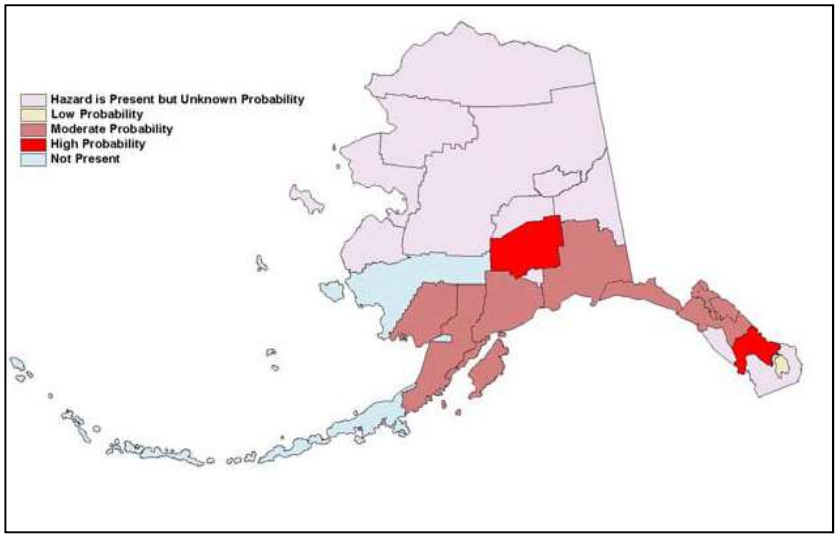


Figure 3. Alaska All-Hazards Mitigation Plan - Fire Risk Map

Previous Occurrences

The community of Tanana has experienced many historic wildland fire and community conflagration events; however, none have been declared as disasters. Table 19 provides information on past fire events, estimated acreage losses, and cause of each event if known. Figure 4 provides a visual representation of past wildland fires. No fire events occurred in 2017.

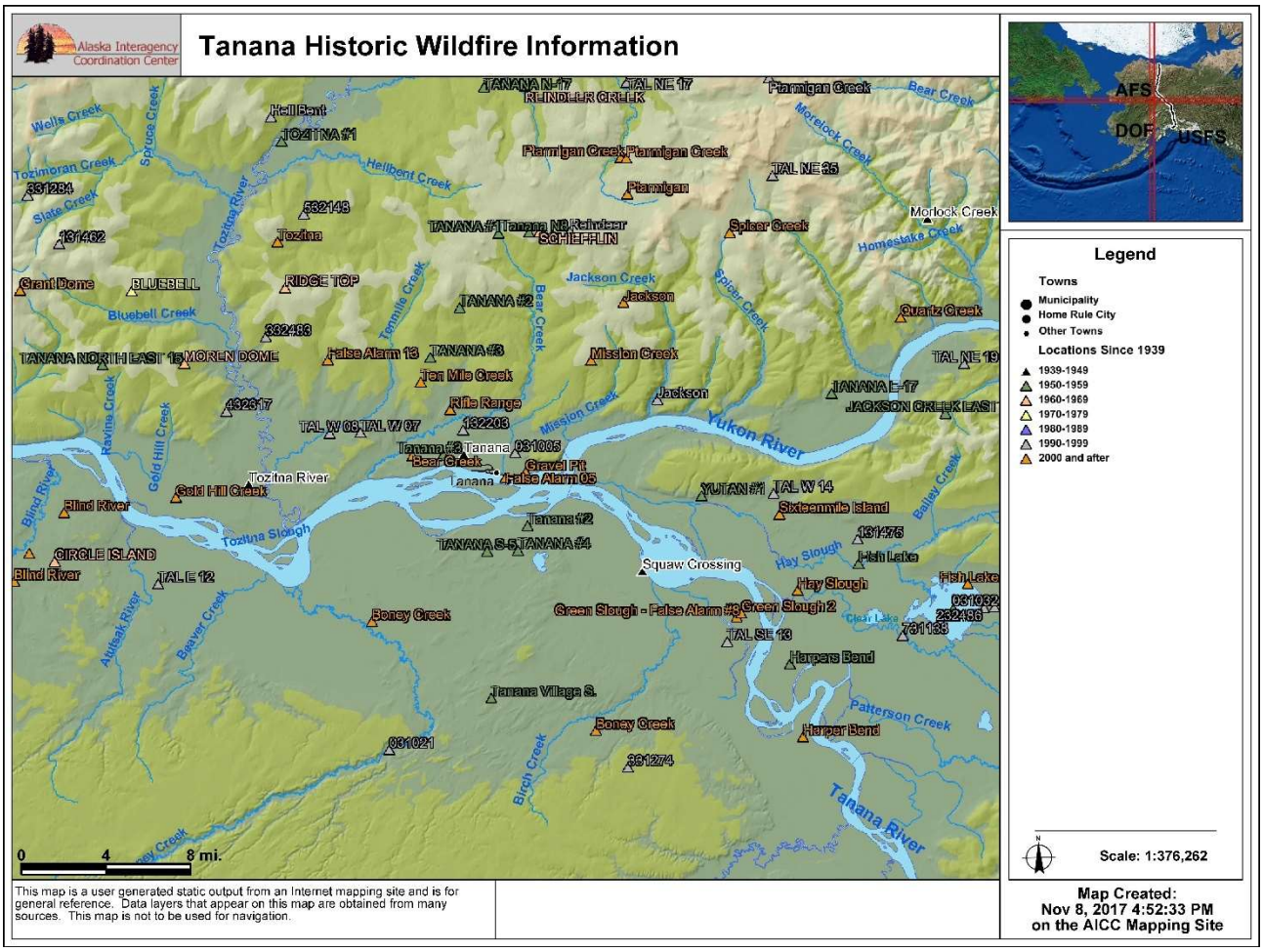


Figure 4. Historic Wildfires near Tanana, Alaska

Table 19. History of Fire Events[3]

Fire Name	Fire Year	Estimated Acres	Lat.	Long.	Specific Cause
Ptarmigan	2016	782.9	65.35733	-151.855	Lightning
Jackson	2015	7377.5	65.28333	-151.867	Lightning
Harper Bend	2015	43378	64.98333	-151.6	Lightning
Blind River	2015	60806.6	65.13042	-152.967	Lightning
Tozitna	2015	78212.5	65.3315	-152.427	Lightning
Hay Slough	2015	91444.2	65.08333	-151.6	Lightning
Spicer Creek	2015	98247.1	65.32883	-151.69	Lightning
Blind River	2009	125.4	65.10361	-152.866	Lightning
Boney Creek	2007	780	65.07111	-152.289	Lightning
Ptarmigan Creek	2006	378.8	65.38167	-151.854	Lightning
Mission Creek	2005	1830.5	65.24472	-151.922	Lightning

[3] Fires listed are within a search radius of 16 miles around Tanana and occurred between 1939 and present-day.

Grant Dome	2005	4668.8	65.30194	-152.848	Lightning
Boney Creek	2005	62562.6	64.9925	-151.933	Lightning
Ten Mile Creek	2000	733.5	65.23333	-152.2	Lightning
Grant Creek	2000	19247	65.23333	-152.983	Lightning
Jackson	1999	407	65.21667	-151.817	Lightning
Hell Bent	1999	547	65.41666	-152.433	Lightning
Reindeer	1996	20	65.33334	-151.95	Lightning
532148	1995	1500	65.35	-152.383	Lightning
132203	1991	50	65.2	-152.133	Lightning
131475	1991	100	65.11667	-151.5	Lightning
TAL N 17	1991	1290	65.45	-152.333	Lightning
131462	1991	17510	65.33334	-152.783	Lightning
TAL NE 17	1990	240	65.43333	-151.85	Lightning
BLUEBELL	1971	2600	65.3	-152.667	Lightning
SCHIEFFLIN	1969	1000	65.33334	-152	Lightning
CIRCLE ISLAND	1969	6400	65.11667	-152.8	Lightning
REINDEER CREEK	1969	30000	65.43333	-152.017	Lightning
RIDGE TOP	1969	251520	65.3	-152.417	Lightning
MOREN DOME	1968	21590	65.25	-152.583	Lightning
TANANA E-17	1959	1100	65.21667	-151.533	Lightning
TOZITNA #1	1958	110	65.4	-152.417	Lightning
GRANT CREEK	1957	10200	65.25	-152.917	Lightning
JACKSON CREEK EAST	1956	15	65.2	-151.35	Lightning
TANANA NORTH EAST 15	1956	120	65.25	-152.717	Lightning
Harpers Bend	1953	40	65.03333	-151.617	Campfire
Fish Lake	1953	800	65.1	-151.5	Incendiary
Tanana Village	1953	5000	65.18333	-152.167	Lightning
Tanana N8	1953	5120	65.33334	-152.017	Lightning
Tanana #3	1951	20	65.18333	-152.167	Smoking
Fish Lake	1951	58	65.06667	-151.35	Campfire
Tanana #2	1951	432	65.13333	-152.033	Incendiary
Tanana Village S.	1951	452	65.01667	-152.1	Incendiary
Morlock Creek	1944	175	65.33334	-151.367	Lightning
Squaw Crossing	1941	640	65.1	-151.85	Unknown
Tozitna River	1940	1280	65.16666	-152.483	Trappers

Section 6. Earthquake

Hazard Description and Characterization

Approximately 11% of the world's earthquakes occur in Alaska, making it one of the most seismically active regions in the world. Three of the ten largest quakes in the world since 1900 have occurred here. Earthquakes of magnitude seven or greater occur in Alaska on average of about once a year; magnitude eight earthquakes average about 14 years between events.

Most large earthquakes are caused by a sudden release of accumulated stresses between crustal plates that move against each other on the earth's surface. Some earthquakes occur along faults that lie within these plates. The dangers associated with earthquakes include ground shaking; surface faulting; ground failures; snow avalanches; and seiches and tsunamis. The extent of damage is dependent on the magnitude of the quake, the geology of the area, distance from the epicenter, and structure design and construction. A main goal of an earthquake hazard reduction program is to preserve lives through economical rehabilitation of existing structures and constructing safe new structures.

Ground shaking is due to the three main classes of seismic waves generated by an earthquake. Primary waves are the first ones felt, often as a sharp jolt. Shear or secondary waves are slower and usually have a side to side movement. They can be very damaging because structures are more vulnerable to horizontal than vertical motion.

Surface waves are the slowest, although they can carry the bulk of the energy in a large earthquake. The damage to buildings depends on how the specific characteristics of each incoming wave interact with the buildings' height, shape, and construction materials.

Earthquakes are usually measured in terms of their magnitude and intensity. Magnitude is related to the amount of energy released during an event while intensity refers to the effects on people and structures at a particular place. Earthquake magnitude is usually reported according to the standard Richter scale for small to moderate earthquakes.

Large earthquakes, like those that commonly occur in Alaska are reported according to the moment-magnitude scale because the standard Richter scale does not adequately represent the energy released by these large events.

Intensity is usually reported using the Modified Mercalli Intensity Scale. This scale has 12 categories ranging from not felt to total destruction. Different values can be recorded at different locations for the same event depending on local circumstances such as distance from the epicenter or building construction practices. Soil conditions are a major factor in determining an earthquake's intensity, as unconsolidated fill areas will have more damage than an area with shallow bedrock. Surface faulting is the differential movement of the two sides of a fault. There are three general types of faulting.

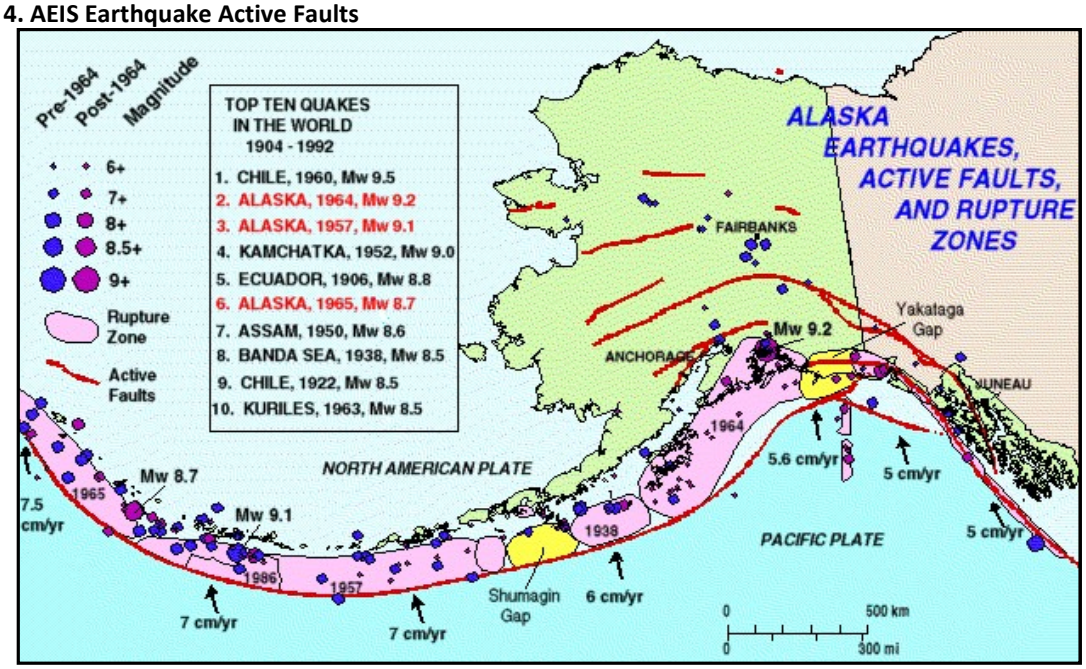
Strike-slip faults are where each side of the fault moves horizontally. Normal faults have one side dropping down relative to the other side. Thrust (reverse) faults have one side moving up and over the fault relative to the other side.

Earthquake-induced ground failure is often the result of liquefaction, which occurs when soil (usually sand and course silt with high water content) loses strength as a result of the shaking and acts like a viscous fluid.

Liquefaction causes three types of ground failures: lateral spreads, flow failures, and loss of bearing strength. In the 1964 earthquake, over 200 bridges were destroyed or damaged due to lateral spreads. Flow failures damaged the port facilities in Seward, Valdez, and Whittier.

Similar ground failures can result from loss of strength in saturated clay soils, as occurred in several major landslides that were responsible for most of the earthquake damage in Anchorage in 1964. Other types of earthquake-induced ground failures include slumps and debris slides on steep slopes.

Map 4. AEIS Earthquake Active Faults



Source: University of Alaska, Fairbanks, and Alaska Earthquake Information Center (AEIC) website

Location

An earthquake hazard event could potentially impact any part of Tanana. Earthquake damage would be area-wide with potential damage to critical infrastructure up to and including the complete abandonment of key facilities.

Extent

The extent of an earthquake in Tanana could be ***critical***; Table 8 uses the following criteria to determine the extent of possible damage: Injuries and/or illnesses that result in permanent disability, complete shutdown of critical facilities for at least two weeks, and more than 25% of property is severely damaged.

Intensity is a subjective measure of the strength of the shaking experienced in an earthquake. Intensity is based on the observed effects of ground shaking on people, buildings, and natural features. It varies

from place to place within the disturbed region depending on the location of the observer with respect to the earthquake epicenter.

The "intensity" reported at different points generally decreases away from the earthquake epicenter. Local geologic conditions strongly influence the intensity of an earthquake; commonly, sites on soft ground or alluvium have intensities two to three units higher than sites on bedrock.

The Richter scale expresses magnitude as a decimal number. A 5.0 earthquake is a moderate event, 6.0 characterize a strong event, 7.0 is a major earthquake, and a great earthquake exceeds 8.0. The scale is logarithmic and open-ended. (*Alaska All-Hazard Risk Mitigation Plan*, 2013)

A magnitude of 2.0 or less is called a microearthquake; they cannot even be felt by people and are recorded only on local seismographs. Events with magnitudes of about 4.5 or greater are strong enough to be recorded by seismographs all over the world. But the magnitude would have to be higher than 5.0 to be considered a moderate earthquake, and a large earthquake might be rated as magnitude 6.0 and major as 7.0. Great earthquakes (which occur once a year on average) have magnitudes of 8.0 or higher (British Columbia 1700, Chile 1960, Alaska 1964). The Richter Scale has no upper limit, but for the study of massive earthquakes, the moment magnitude scale is used. The modified Mercalli Intensity Scale is used to describe earthquake effects on structures.

Maps 4 and 5 show active fault lines in Alaska. The 2013 *Alaska All-Hazard Mitigation Plan* lists the Tanana area as having zero impact for previous occurrence but a moderate probability of an earthquake. However, since all of Alaska is at risk for an earthquake event, Tanana could be at risk for an earthquake or have secondary impact from an earthquake in the region.

Impact

The impact on the community of Tanana from a severe earthquake could be extensive. Portions of the community could be cut off from critical facilities, and infrastructure and services could be disrupted for an extended period.

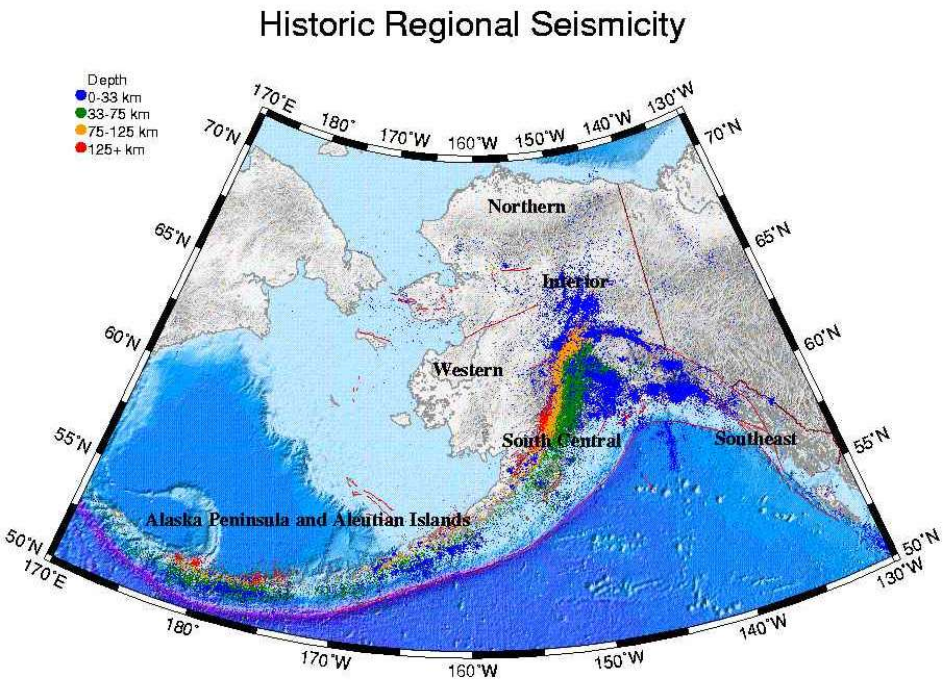
Earthquake damage would be area-wide with potential damage to critical infrastructure up to and including the complete abandonment of key facilities.

Probability

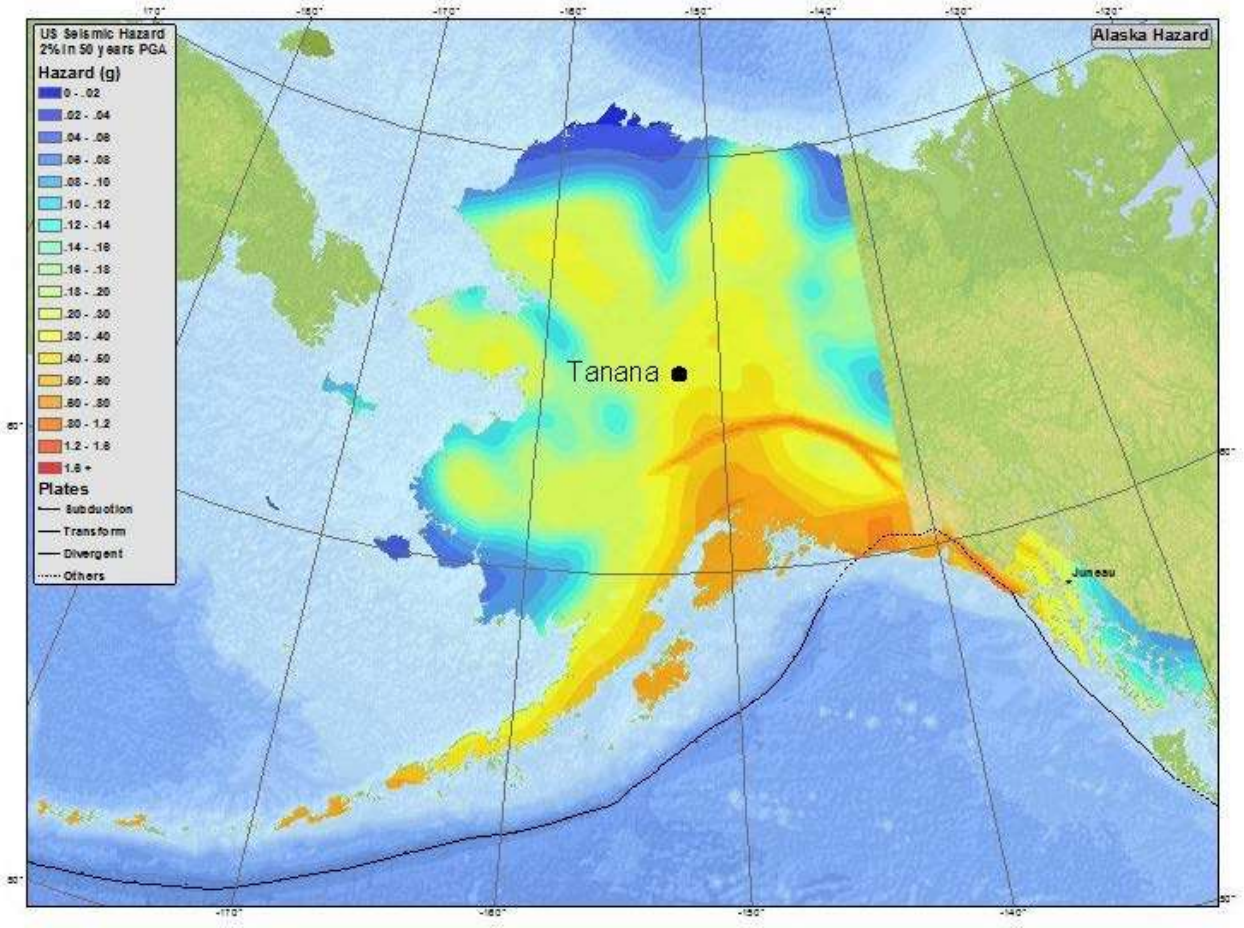
Tanana has a **likely** probability of earthquake hazard. Table 9 lists the following criteria for a likely probability: Hazard is present with a moderate probability of occurrence within the next three years. Event has up to 1 in 3 year's chance of occurring.

While it is not possible to predict an earthquake, the United States Geological Society (USGS) has developed Earthquake Probability Maps that use the most recent earthquake rate and probability models. These models are derived from earthquake rate, location, and magnitude data from the USGS National Seismic Hazard Mapping Project. Map 6 indicates that the USGS earthquake probability model places the probability of an earthquake with a likelihood of experiencing moderate shaking (0.30 g to 0.40g peak ground acceleration) at a 2% probability in 50 years, based on the USGS Alaska hazard model.

Map 5. Alaska Earthquake Information System Historic Regional Seismicity



Map 6. USGS Tanana Earthquake Probability Map



Previous Occurrences

The community of Tanana has experienced a few earthquake/seismic events. Table 20 provides information on past seismic events, including the latitude and longitude of the epicenter, depth in kilometers, and magnitude of the earthquake event.

03-203 Denali Fault Earthquake (AK-DR-1440). Declared November 6, 2002 by Governor Knowles, then FEMA Declared November 8, 2002 – A major earthquake with a preliminary magnitude of 7.9 occurred on the Denali Fault in Interior Alaska on November 3, 2002, with strong aftershocks. The earthquake caused severe and widespread damage and loss of property, and threat to life and property in the Fairbanks North Star Borough, the Denali Borough, the Matanuska-Susitna Borough, and numerous communities within the Delta/Greely, Alaska Gateway, Copper River, and Yukon-Koyukuk REAAs including the cities of Tetlin, Mentasta Lake, Northway, Dot Lake, Chistochina and Tanacross, and the unincorporated communities of Slana and Tok. The areas experienced severe damage to numerous personal residences requiring evacuations and sheltering of residences; extensive damage to primary highways including the Richardson Highway, the Tok Cutoff, the Parks Highway and road links to communities including the road to Mentasta and Northway. Damage to supports for the Trans-Alaska Pipeline necessitated the shutdown of the pipeline. Additionally, fuel spills from residential storage

tanks, significant damage to water, septic, sewer and electrical systems also occurred. Not all of the areas listed in the State disaster were included in the Federal Individual Assistance Program. Assistance to those areas was through the State Individual Assistance Program. Additionally, not all of the areas listed in the State declaration were eligible for all categories of assistance under the federal Public Assistance Program. Those areas were only eligible for Debris Removal and Emergency Protective Measures under the Federal Public Assistance Program but were eligible for all Permanent Work categories under the State Public Assistance Program. FEMA also authorized 404 Mitigation money. Tanana residents felt this earthquake and the aftershocks, but no damage occurred in the community.

Table 20. Seismic occurrences impacting Tanana.[4]

Date / Time (UTC)	Lat.	Long.	Depth (km)	Magnitude	Location
5/18/2016 3:25	65.299	-151.093	12	4.6	39km NNW of Manley Hot Springs, Alaska
5/18/2016 3:25	65.2466	-151.065	15.2	4.4	34km NW of Manley Hot Springs, Alaska
6/30/2009 18:52	66.004	-151.806	15.1	4	Northern Alaska
6/3/2004 17:25	64.443	-151.813	10.3	4.1	Central Alaska
4/2/2003 6:47	65.289	-150.015	16.2	4.5	Northern Alaska
4/2/2003 6:39	65.284	-150.04	16.5	4.6	Northern Alaska
6/4/2001 18:42	64.735	-152.43	10	5.1	Central Alaska
3/17/2001 20:50	65.518	-150.143	20.8	4.1	Northern Alaska
11/9/2000 16:25	64.632	-152.473	10	4.6	Central Alaska
1/15/1996 11:58	65.315	-150.372	13.2	4	Northern Alaska
10/16/1995 23:29	65.809	-151.125	9.2	4.4	Northern Alaska
12/17/1994 2:07	65.116	-150.436	11.6	4.2	Northern Alaska
6/16/1990 4:28	64.661	-151.098	33	4.1	Central Alaska
9/5/1988 9:17	65.006	-151.683	33	4	Northern Alaska
6/4/1986 15:48	65.636	-152.604	10	5.4	Northern Alaska
7/14/1985 19:07	65.613	-151.443	10	4.3	Northern Alaska
2/22/1984 16:04	65.032	-150.744	33	4.3	Northern Alaska
1/4/1984 20:04	65.473	-150.31	33	4.8	Northern Alaska
9/10/1981 11:06	65.092	-152.222	14.9	4.2	Northern Alaska
8/22/1978 4:13	65.16	-151.99	14	4	Northern Alaska
5/25/1978 10:39	64.551	-152.592	33	4	Central Alaska
4/25/1977 3:18	65.707	-150.954	33	4	Northern Alaska
10/29/1968 22:16	65.393	-150.072	10	6.7	Northern Alaska
5/11/1958 5:23	64.901	-151.914	15	5.9	Central Alaska
5/10/1958 22:54	65.05	-151.931	15	5.9	Northern Alaska

[4] Magnitude 4.0 or greater within 50 km of Tanana occurring from 1957 to present-day

Section 7. Severe Weather

Hazard Description

Weather hazards include winter weather, thunder and lightning, hail, high wind, and ice storms. Winter weather includes heavy snows, ice, *aufeis*, and extreme cold.

Aufeis is glaciation or icing of streams and rivers, often affecting road surfaces and infrastructure. Aufeis forms during the winter when emerging ground water freezes. Stream glacial flooding occurs when ice forms from the bottom up instead of the top down, forcing water out of the stream channel. When aufeis occurs on a roadway, travel is difficult.

Heavy snow can bring the community of Tanana to a standstill by inhibiting transportation, knocking down trees and utility lines, and causing structural collapse in buildings not designed to withstand the weight of the snow. Typical impacts also include repair and snow removal costs.

Ice buildup can collapse utility lines and communications towers, as well as make transportation difficult and snap trees, which can later cause dead stands of trees that increase hazard for wildfires. Ice can also become a problem on roadways if the temperature warms up just enough for precipitation to fall as freezing rain where a pressure differential occurs across a mountain range. Ice storms in November and December 2010 snapped and killed large stands of trees around Tanana, which resulted in increased fuel loads for wildland fire.

Extreme cold can lead to hypothermia and frostbite, which are both serious medical conditions. Cold causes fuel to congeal in storage tanks and supply lines, stopping electric generators. Without electricity, heaters do not work, causing water and sewer pipes to freeze or rupture. Extreme cold can also interfere with transportation if the ambient temperature is below an aircraft's minimum operating temperature. Extreme cold increases the likelihood of ice jams and flooding. If extreme cold conditions are combined with low/no snow cover, the ground's frost level can change, creating problems for underground infrastructure. In January 1989, Tanana had a record -76°F.

Thunderstorms are caused by turbulence and atmospheric imbalance. They arise from a combination of unstable rising warm air, moisture to form clouds and rain, and the upward lift of air currents resulting from interacting weather fronts (warm and cold), sea breezes, or mountains.

Lightning exists in all thunderstorms, resulting from a buildup of charged ions within the thundercloud. When lightning connects with a grounded object, electricity is released, which can be harmful to humans. Lightning can also start fires. Hail is associated with thunderstorms. Hailstones are ice formations greater than 0.75 inches in diameter that fall with rain. The size and severity of the storm determine the size of the hailstones.

Lightning is often the cause of wildland fires in and near Tanana, and lightning usually occurs between May and July. One member of the community stated that 20 years ago, lightning hit power lines, which caused damage to electronic appliances and computers. Also on July 4, 2010, lightning damaged the Public Safety radio tower and telephone system. The City had to replace computers and had approximately $5,000 in losses. The Fire Station building burned in a lightning strike, and repairs were estimated at $20,000 to $25,000.

High winds occur when there are winter low-pressure systems in the North Pacific Ocean and the Gulf of Alaska. High winds in the community of Tanana can equal hurricane force but fall under a different classification because they are not cyclonic nor possess other characteristics of hurricanes. High winds have the potential to seriously damage community infrastructure (especially aboveground utility lines causing localized power failure).

Location

The entire community of Tanana could be impacted by severe weather.

Extent

The extent of severe weather in Tanana could be ***critical***; Table 8 uses the following criteria to determine the extent of possible damage: Injuries and/or illnesses that result in permanent disability, complete shutdown of critical facilities for at least two weeks, and more than 25% of property is severely damaged.

Impact

Homes in the Circle Subdivision, buildings on Front Street north of the Yukon River, and forested areas surrounding Tanana have historically sustained damage during severe weather events. Given the range of severe weather and resulting damage, the Hazard Mitigation Planning Team estimated that 50% of the community's critical infrastructure and buildings are susceptible to high or catastrophic damage.

Probability

The community of Tanana is subject to a uniform risk of severe weather. Based on historical information, it is estimated that there is 3-year recurrence interval for severe weather events, which equates to an annual probability of 33%. Table 9 defines this level of probability as **likely**.

Previous Occurrences

The community of Tanana has experienced many severe weather events, although they may not be well-documented. Figure 5 provides a visual representation of the severe weather events that have occurred from 2001 to 2016.

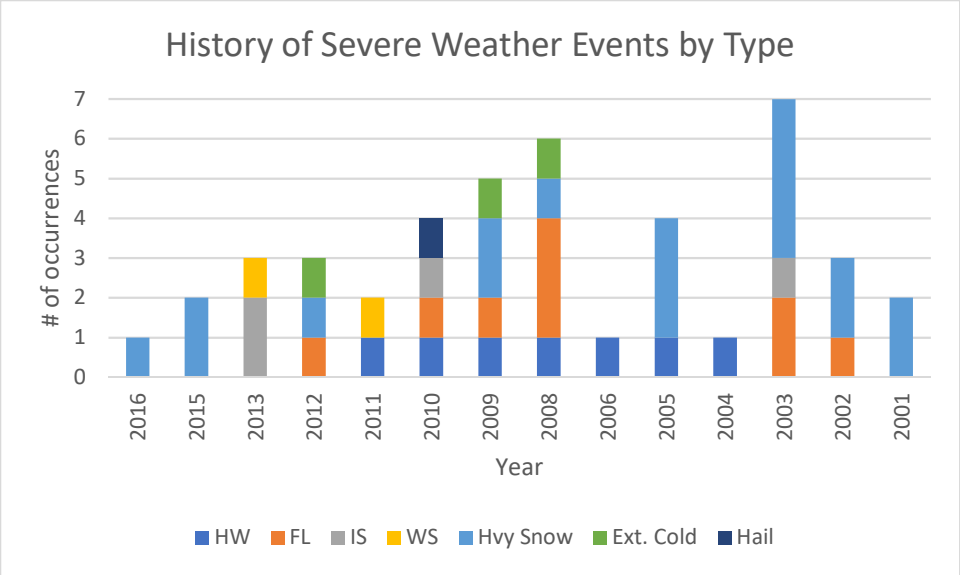


Figure 5. History of Severe Weather Events by Type

Section 8. Technological

Hazard Description

Technological hazards are those that are not natural in origin. The community of Tanana faces some technological hazards, including hazardous material accidents, infrastructure failures, oil spills, and human-caused fires.

Power outages are also a type of common infrastructure failure in the community of Tanana. They are often caused by weather, such as freezing temperatures and lightning strikes and result in additional damages, such as water and sewer system freeze-ups. A wide range of impacts and severity of impacts can result from technological hazard events.

Location

An estimated 50% of the community of Tanana would be impacted by a technological hazard.

Extent

The extent of a technological hazard in Tanana could be **critical**, depending on the location of the technological event; Table 8 uses the following criteria to determine the extent of possible damage: Injuries and/or illnesses that result in permanent disability, complete shutdown of critical facilities for at least two weeks, and more than 25% of property severely damaged.

Impact

A wide range of impacts and severity of impacts can result from technological hazard events.

Probability

It is difficult to determine the probability of future technological events, because of the various causes of contamination and spill events. However, with improved handling of fuel storage, hazardous materials practices, and general awareness and spill prevention, a minimum probability of future events related to spills and releases is anticipated. Additionally, with the expansion of Too'gha's sewer and water systems, a minimum probability of future problems associated with damaged culverts and contamination associated with outdoor privies is anticipated.

Previous Occurrences

The community of Tanana has experienced many technological disaster events. Table 21 provides information on past technological disaster events, impacts, and estimated losses.

Most of the events listed below were taken from the Alaska Department of Environmental Conservation Contaminated Sites Program Database.

Table 21. History of Technological Disaster Events

Date	Location and Extent	Impact	Estimated Loss
Ongoing	Circle Subdivision and outlying areas; lack of water and sewer services; potential for groundwater and surface water contamination.	Seasonal runoff from outdoor privies, dog logs, and surface dumping of honey buckets and grey water; poor site drainage is also a potential health hazard with standing water and contamination.	Unknown
2009 update	Soil and groundwater contamination from ASTs, USTs, bulk fuel tank farm, and fuel distribution system.	Alternate soil cleanup levels developed in 1997, which ADEC approved, but no letter found in administrative file. The former hospital, generator building, and vehicle maintenance garage were demolished during summer of 2009.	
1994	BLM/Alaska Fire Service Housing	Groundwater was impacted, and contamination moved towards the Yukon River 200 yards from site. Rough SA using 8' test holes drilled around vent and fill pipe found contaminated soils around houses #104 and 106. BIA interested in taking over house units, requested soil testing for contamination around HOTs. FAA allows BLM/AFS summer use. 3 of 4 house units formerly used HOTs prior to converting to electricity, House #6, 1,000 gallons with 348 gallons diesel left; house #103 with 275 gallons diesel left; house #104 with 154 gallons diesel left. (5 soil samples) 37-3,400 ppm DRPH.	
1991	FAA Tanana Station	Reported potential contaminants onsite in unknown quantities include petroleum, oil, lubricant waste, PCBs, asbestos, solvents, herbicides, paints, antifreeze. Dates of disposal, presence or extent of contamination unknown. Update:	

		site investigations indicate that fuel, primarily diesel-range organics, are contaminants of concern. Isolated areas of benzene many exist across the FFA Flight Service Station.	
Fall of 1984	Pumphouse spill in fall of 1984	Water samples from 1984 indicated no contamination of current water supply well. Antimony near MCL and RRO 1/10 Table C value detected in one water sample collected from Tanana Tribal Council municipal drinking water well in August 2001 by EPA START.	
1975	Former Indian Health Service Tanana Hospital; fuel spill extent unknown	Fuel spill from above ground tank; contaminated well abandoned in 1976.	Removal action for soil

Section 9. Climate Change

Hazard Description

For this MJHMP, climate change refers to the long-term variation in atmospheric composition and weather patterns on a global scale. Global climate change may occur gradually due to small variations or rapidly due to large catastrophic forces. Greenhouse gasses, especially carbon dioxide (CO_2) and methane (CH_4), are commonly regarded as the most significant factors influencing the Earth's current climate.

Significant atmospheric variations may also be influenced by more than one event, for instance, an asteroid impact and a major eruption over a longer time period. For scientists studying climate change, both hazards imply different time periods. Therefore, the time period estimates for previous climate change events tend to vary and cannot be accurately applied to current predictive climate change models, which now must account for human activity. This is significant because hazard mitigation planning relies greatly upon the historical record.

Location

Climate change is a global event.

Extent

Through studies of the historical record, we know climate change affects water acidity, atmospheric composition, precipitation, weather patterns, and temperatures.

Local Impact

The majority of the residents of Tanana rely on subsistence practices for their food resources, which are supplemented by store-bought foods. Tanana residents have stated that a noticeable change in climate in the past decade has impacted their subsistence resources. These concerns are shared by many villages throughout Alaska, and more research is needed to substantiate these concerns. However, the individuals participating in the development of this plan felt that this LHMP should reflect their concerns.

One community member said he's noticed the lakes are drying up in areas where he used to hunt waterfowl. The member also spoke of a change in wind patterns, and he believed there were more geese in present times than in the past.

Another community member who works for Too'gha water and sewer utility spoke of the lack of snow in 2010 and its insulating effects caused winter frost to freeze the sewer lines. The individual felt that low usage of the sewer utility contributed to the freeze-up and that an increase of customers would help.

One community member also spoke of her concern for sloughing along the Yukon River and wetlands drying up. Also the later freeze-up in winter and earlier thaw in the spring has impacts with transportation to subsistence areas.

Per the Tanana Tribal Chief, snow levels during the winter season are much less, and the drifts are not as high. As of November 2017, river levels are the lowest that the Tanana has ever seen for the third consecutive year.

Heat in summer time and lighting strikes from climate change have increased. Hotter and drier summers

and increased electrical storm activity could contribute to volatile and rapidly expansive wildland fires.

Global Impact

The major effect of climate change is the abrupt decline of the earth's bio-diversity and population of organisms.

Probability

Given the Earth's history of mass extinctions attributed to climate change, the current observed changes in the atmosphere, and the criteria identified in Table 9, it is "credible" that a disaster event attributed to climate change will occur in the next ten years as the probability is less than or equal to 10% likely per year.

Section 10. Hazards Not Profiled in the 2017 Tanana MJHMP

Avalanche

Alaska experiences many snow avalanches every year. The exact number is undeterminable as most occur in isolated areas and go unreported. Avalanches tend to occur repeatedly in localized areas and can sheer trees, cover communities and transportation routes, destroy buildings, and cause death. Alaska leads the nation in avalanche accidents per capita.

Avalanche Vulnerability Assessment

The terrain and climate surrounding Tanana do not provide the necessary conditions for avalanche. No threat from avalanche is present in Tanana.

Volcano

Alaska is home to more than 40 historically active volcanoes stretching across the entire southern portion of the state, from the Wrangell Mountains to the far western Aleutians. On average, one to two eruptions occur per year in Alaska. In 1912, the largest eruption of the twentieth century occurred at Novarupta and Mount Katmai, located in what is now Katmai National Park and Preserve on the Alaska Peninsula. However, the 2013 *Alaska All-Hazard Mitigation Plan* indicates that the Yukon-Koyukuk REAA is not affected by volcanoes.

Volcano Vulnerability Assessment

The Alaska Volcano Observatory identifies the closest volcanoes (unmonitored) to Tanana as being Jumbo Dome and Buzzard Creek. The nearest monitored volcano is the Mount Spurr volcano, located on the west side of the Cook Inlet.

Tsunami/Seiche

A tsunami is a series of long waves generated in the ocean by a sudden displacement of a large volume of water. Underwater earthquakes, landslides, volcanic eruptions, meteor impacts, or onshore slope failures can cause this displacement. Most tsunamis originate in the Pacific "Ring of Fire," the area of the Pacific bounded by the eastern coasts of Asia and Australia and the western coasts of North America and South America that is the most active seismic feature on earth.

Tsunami/Seiche Vulnerability Assessment

Tanana is located in interior Alaska, an area not impacted by tsunamis or seiches.

Ground Failure

Ground failure related to thawing permafrost is a significant problem in Alaska. Permafrost is frozen ground in which a naturally occurring temperature below 32° F has existed for two or more years. Approximately 85% of Alaska is underlain by continuous or discontinuous permafrost. Permafrost is continuous in extent over most of the Arctic but is discontinuous and sporadic or isolated in most areas south of the Brooks Range. Only the southern coastal margins are permafrost-free. Measured recorded depths extend from 1,330 feet near Pt. Barrow to 350 feet at Nome, 265 feet at Fairbanks, and 100 feet near Tok. Permafrost can form a strong and stable foundation material if it is kept frozen, but if it is allowed to thaw, the soil can

become weak and fail. Materials most susceptible to thaw settlement are fine-grained soils with high ice content. Permafrost can thaw in response to general climate changes and warming or because of human activity that heats the soil or removes insulating cover.

Ground Failure Vulnerability Assessment

Tanana is labeled as having discontinuous permafrost; however, because of the gravel base in Tanana, permafrost is not a major issue.

Erosion

Erosion is a problem throughout Alaska. It can pose critical hazards to communities located along the coast or rivers as banks can become eroded by the flowing water, potentially from floods. These hazards can be so severe as to have communities looking for relocation.

Erosion Vulnerability Assessment

The erosion that is present in Tanana is located downriver from the City; therefore, it does not pose a serious threat to the City of Tanana.

Chapter 4. Mitigation Strategy

The Hazard Mitigation Planning Team identified eight goals to address the primary hazards profiled in Chapter 3, Sections 4-9. Mitigation goals identified in Table 22 are long-term policy objectives to reduce the costs of disaster response and recovery and to minimize disruption to the community following a disaster. Table 23 identifies specific mitigation actions that stem from these mitigation goals. Through this planning process, the Hazard Mitigation Planning Team intends to reduce the overall vulnerability of the community of Tanana to all hazards. It is important to note that the mitigation goals in Table 22 are the shared goals of the City and NVT.

Table 22. Mitigation Goals

Goal	Description	Hazards Mitigated	2017 Status
1	Execute Drainage Plan from 2011 for Community-Wide Concerns	Flooding	In progress; 50% completed—remainder is dependent on funding
2	Build a community shelter/multi-purpose facility	All hazards	Not completed
3	Implement actions within Tanana CWPP 2010	Wildland Fire	Not completed; want more fire breaks based upon CWPP
4	Build an Emergency Operations Center on the second story of the Fire Station Shop	All hazards	No longer a mitigation goal; apartments are already present on 2nd floor of Fire Station Shop. This goal will be deleted in the next plan.
5	Relocate or elevate ~30 homes in Circle Subdivision and 1st Avenue/Front Street; add to utility grid	Flooding	Not completed; due to lack of funding but this is a high priority for the community
6	Relocate repeater from fire station to Mission Hill	All Hazards	Completed
7	Elevate sewer lift station	Flooding	**New goal (2017)**—1 of 2 stations are within the flood zone
8	Harvest dead trees	Wildland fire	**New goal (2017)**—obtain funding to harvest 100,000 acres of dead trees (due to spruce bark beetle) and use in wood-boiler systems
9	Elevate 100 feet of evacuation road	Flooding	**New goal (2017)—** mitigate hazard

From the mitigation goals identified in Table 22, the Hazard Mitigation Planning Team identified nine mitigation actions (Table 23) focusing on reducing hazard impacts to existing and new development.

Mitigation actions are practical and achievable actions that the community of Tanana can undergo to reduce its vulnerability to hazards. Mitigation actions strive to achieve the following.

- Prevent development that is vulnerable to hazards. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.
- Protect current critical infrastructure and buildings from hazard damages. Examples include acquisition, elevation, relocation, and structural retrofits.
- Educate the public on hazard mitigation and ways they can support planning efforts. These actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
- Protect natural resources from hazard damages. These actions include sediment and erosion control, stream corridor restoration, watershed forest and vegetation management, and wetland restoration and preservation.
- Protect emergency services against hazard damages. Services include warning systems, emergency response services, and protection of critical facilities.
- Promote structural projects that decrease community vulnerability and include actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, retaining walls, and safe rooms.

Table 23. Mitigation Actions

1	Goal 1 - Execute Remedial Actions in the Drainage Plan	2017 Status Update
a	The City and NVT should adopt a resolution to execute the recommended remedial actions in the Preliminary Drainage Plan, dated February 16, 2011.	Goal 1 is a work in progress with 50% of the work recommended in the Preliminary Drainage Plan implemented. To date, work has included cleaning clogged culverts, replacing undersized culverts, and excavation of ditches to drain water from the City streets during rain and snowmelt events. The completion of this goal is dependent on funding.
b	The plan identified six general problem areas where drainage issues exist and will worsen without remediation. Those six areas are: 1) culverts are clogged with debris and sediment, or crushed; some culvert elevations are opposite of the natural drainage; 2) drainage swales/ditches are clogged with debris and sediment or improper sloping; 3) roads have potholes and ponding issues; 4) new construction is improper or no best management practices were implemented during installation; 5) the planned fire line north of Tanana has no best management practices incorporated; and 6) the road at the First Avenue boat launch at the Yukon River was not properly graded, and accesses are default storm water paths that are eroding the access and riverfront.	

c	The City and NVT should seek funding for these proposed remedial actions. The total estimated cost for remediation of the problem areas and specific locations is $314,700.	
2	**Goal 2 - Build a Community Shelter/Multipurpose Building**	
a	Tanana currently uses the Tanana City School as a community shelter; however, the school (the community's shelter) is located near the Yukon River and was threatened by the 2009 ice jam flood. The community would benefit from the construction of a community shelter/multipurpose building located above the 500-year floodplain.	This action was not implemented due to lack of funding.
b	The shelter could also serve as a center for community meetings and training as well as offices for City or Tribal departments.	
c	The shelter should be equipped with a large kitchen and bathrooms with room capacity for 300, with the ability to divide the room in half.	
d	The building should have a backup emergency generator.	
3	**Goal 3 - Implement Mitigation Objectives Recommended in the Tanana CWPP**	
a	The City and NVT should implement the mitigation objectives recommended in the Tanana CWPP and seek funding to complete those actions.	This community has completed 50% of the recommendation actions in the Tanana CWPP. More funding is needed to complete the last 50%.
b	The City and NVT should implement Alaska Fire wise Standards within Tanana.	
c	Construct shaded fuel breaks to prevent spread of wildfire into the community.	
d	Improve interagency coordination to aid in the suppression of wildland fire and community conflagration fire that could impact Tanana.	
4	**Goal 4 - Build Emergency Operations Center**	
a	Tanana has adopted the use of an Incident Command System for the management of emergencies. Currently, Tanana lacks an Emergency Operations Center (EOC) facility that has access to a communications system, internet, and interoperable radios. During the 2009 Yukon River Flood, most of the buildings in Tanana were under water and the upstairs apartment of the Fire Station was the only place that was dry.	This is no longer a mitigation goal. Apartments already exist on the 2nd floor of the Fire Station Shop. The community has no interest in this goal, and this goal will be deleted in the next MJHMP update.
b	The City should seek funding to equip the EOC with communications, internet, interoperable radios, and a backup generator.	
c	Tanana could serve as a sub-regional EOC for Interior villages of Alaska, if such a facility were built.	

5	**Goal 5 - Relocate or elevate ~30 homes in Circle Subdivision and 1st Avenue/Front Street; add to utility grid**	
a	Members of the Hazard Mitigation Planning Team have stated that the Circle Subdivision is located at a low elevation point, and some homes on 1st Avenue/Front Street are also within the floodplain. When waters rise on the Yukon River, it flows into the subdivision and natural drainages, and flooding occurs. The City should seek funding to relocate or to elevate ~30 homes in the Circle Subdivision and on 1st Avenue/Front Street.	Goal has not been completed due to lack of funding, but this goal is a high priority for the community.
b	These homes should be moved to a location where they can be added to the utility grid (water and sewer).	
c	Some of the lots in the Circle Subdivision are privately-owned, and homeowners do not have funding to elevate their homes.	
6	**Goal 6 - Relocate Radio Repeater to Mission Hill**	
a	The City of Tanana has a new radio repeater; however, the location of the repeater in the Fire Station garage only allows for communications within a 30-mile radius.	This goal has been completed. The radio repeater was relocated and is operational.
b	The City has a partnering agreement with Yukon Telephone, which was granted permission from the land owner, NVT, to place a cell tower on Mission Hill. The repeater could be co-located with the cell tower.	
c	The new location would expand the range of communications to Ruby and Fairbanks. With expanded range of radio communications, Tanana could better serve neighboring remote villages in the region during emergencies.	
7	**Elevate sewer lift station**	
a	There are two lift stations. The east one is in an area where the ~30 homes are to be moved. This manhole needs to be raised in case of flooding.	This goal is new in 2017. During flooding events, water overtops the pump and renders the lift station inoperable, spreading sewage throughout the east side of the community.
8	**Harvest dead trees**	
a	Harvest 100,000 acres of dead trees (due to spruce bark beetle) and use in wood- boiler systems. This fuel reduction would assist in decreasing risk from wildland fires and also provide valuable fuel to the community's four biomass wood-boilers to electrical generation system.	This goal is new in 2017.
9	**Elevate portion of evacuation road**	
a	Elevate approximately 100 feet of road damaged by inadequate insulation. This road is plagued by flooding and is the evacuation road between the City and the airport.	This goal is new in 2017.

Benefit - Cost Review

This chapter of the MJHMP outlines Tanana's overall strategy to reduce its vulnerability to the effects of the hazards studied. Currently, the planning effort is limited to the hazards determined to be of the most concern; however, the mitigation strategy will be regularly updated as additional hazard information is added and new information becomes available.

The projects listed in Table 24 were prioritized using a listing of benefits and costs review method as described in the FEMA How-To-Guide Benefit-Cost Review *in Mitigation Planning* (FEMA 386-5).

Due to monetary as well as other limitations, it is often impossible to implement all mitigation actions. Therefore, the most cost-effective actions for implementation will be pursued for funding first, not only to use resources efficiently, but also to make a realistic start toward mitigating risks.

The City of Tanana and NVT considered the following factors in prioritizing the mitigation projects. Due to the dollar value associated with both life-safety and critical facilities, the prioritization strategy represents a special emphasis on benefit-cost review because the factors of life-safety and critical facilities steered the prioritization towards projects with likely good benefit-cost ratios.

- Extent to which benefits are maximized when compared to the costs of the projects, the Benefit Cost Ratio must be 1.0 or greater.
- Extent the project reduces risk to life-safety.
- Project protects critical facilities or critical community functionality.
- Hazard probability.
- Hazard severity.

Other criteria that were used in developing the benefits – costs listing depicted in Table 24:

- Vulnerability before and after mitigation
- Number of people affected by the hazard, area-wide, or specific properties.
- Areas affected (acreage) by the hazard
- Number of properties affected by the hazard
- Loss of use
- Loss of life (number of people)
- Injury (number of people)
- List of Benefits
- Risk reduction (immediate or medium time frame)
- Other community goals or objectives achieved
- Easy to implement
- Funding available
- Politically or socially acceptable
- Costs
- Construction cost

- Programming cost
- Long time frame to implement
- Public or political opposition
- Adverse environmental effects

This method supports the principle of benefit-cost review by using a process that demonstrates a special emphasis on maximization of benefits over costs. Projects that demonstrate benefits over costs and that can start immediately were given the highest priority. Projects that the costs somewhat exceed immediate benefit and that can start within five years (or before the next update) were given a description of medium priority, with a timeframe of one to five years. Projects that are very costly without known benefits probably cannot be pursued during this plan cycle, but are important to keep as an action were given the lowest priority and designated as long term.

After the MJHMP has been approved, the projects must be evaluated using a BCA during the funding cycle for disaster mitigation funds from DHS&EM and FEMA.

A description of the BCA process follows. Briefly, BCA is the method by which the future benefits of a mitigation project are determined and compared to its cost. The result is a Benefit-Cost Ratio (BCR), which is derived from a project's total net benefits divided by its total cost. The BCR is a numerical expression of the cost-effectiveness of a project. Composite BCRs of 1.0 or greater have more benefits than costs, and are, therefore, cost-effective.

Benefit-Cost Analysis

The following section is reproduced from a document prepared by FEMA, which demonstrates how to perform a BCA. The complete guidelines document, a BCA document, and BCA technical assistance is available online http://www.fema.gov/benefit-cost-analysis.

Facilitating BCA

Although the preparation of a BCA is a technical process, FEMA has developed software, written materials, and training that simplify the process of preparing BCAs. FEMA has a suite of BCA software for a range of major natural hazards: earthquake, fire (wildland/urban interface fires), flood (riverine, coastal A-Zone, Coastal V-Zone), hurricane wind (and typhoon), and tornado.

Sometimes there is not enough technical data available to use the BCA software mentioned above. When this happens, or for other common, smaller-scale hazards or more localized hazards, BCAs can be done with the Frequency Damage Method (i.e., the Riverine Limited Data module), which is applicable to any natural hazard as long as a relationship can be established between how often natural hazard events occur and how much damage and losses occur as a result of the event. This approach can be used for coastal storms, windstorms, freezing, mud/landslides, severe ice storms, snow, tsunami, and volcano hazards.

Applicants and sub-applicants must use FEMA-approved methodologies and software to demonstrate the cost-effectiveness of their projects. This will ensure that the calculations and methods are standardized, facilitating the evaluation process. Alternative BCA software may also be used, but only if the FEMA Regional Office and FEMA Headquarters approve the software.

To assist applicants and sub-applicants, FEMA has prepared the *FEMA Mitigation BCA Toolkit* CD. This CD includes all of the FEMA BCA software, technical manuals, BC training courses, data-documentation templates, and other supporting documentation and guidance.

The *Mitigation BCA Toolkit* CD is available free from FEMA Regional Offices or via the BCA Helpline (at bcahelpline@fema.dhs.gov or toll-free number at (855) 540-6744.

The BC Helpline is also available to provide BCA software, technical manuals, and other BCA reference materials as well as to provide technical support for BCA.

For further technical assistance, applicants or sub-applicants may contact their State Mitigation Office, the FEMA Regional Office, or the BCA Helpline. FEMA and the BCA Helpline provide technical assistance regarding the preparation of a BCA.

Eligible Projects for PDM Funding

> Benefit-Cost Review vs. Benefit-Cost Analysis (FEMA 386-5) states in part:
>
> Benefit-Cost Review for mitigation planning differs from the benefit cost analysis (BCA) used for specific projects. BCA is a method for determining the potential positive effects of a mitigation action and comparing them to the cost of the action. To assess and demonstrate the cost-effectiveness of mitigation actions, FEMA has developed a suite of BCA software, including hazard-specific modules. The analysis determines whether a mitigation project is technically cost-effective. The principle behind the BCA is that the benefit of an action is a reduction in future damages.
>
> DMA 2000 does not require hazard mitigation plans to include BCAs for specific projects, but does require that a BCR be conducted in prioritizing projects.

The PDM Grant Program is federally funded through FEMA at 75% of the plan or project and requires a 25% local fund match. Small, impoverished communities may be eligible for up to a 90% Federal cost share in accordance with the Stafford Act. The program is annual, nationally competitive, and is intended to reduce

overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants include HMPGs.

Hazard Mitigation Projects are intended to reduce risk to life and property and examples include:

- Elevation of flood prone structures;
- Structural and non-structural seismic retrofits of public facilities;
- Voluntary acquisition or relocation of structures out of the floodplain;
- Natural hazard protective measures for utilities, water and sanitary sewer systems; and
- Localized storm water management and flood control projects.

Eligible Projects for HMGP Funding

These criteria are designed to ensure that the most appropriate projects are selected for funding. Projects may be of any nature that will result in protection of public or private property from natural hazards. Some types of projects that **may be eligible** include:

- Acquisition of hazard prone property and conversion to open space;
- Retrofitting existing buildings and facilities;
- Elevation of flood prone structures;
- Vegetative management/soil stabilization;
- Infrastructure protection measures;
- Stormwater management;
- Minor structural flood control projects; and
- Post-disaster code enforcement activities.

The following types of projects **may not be eligible** under the HMGP:

- Retrofitting places of worship (or other projects that solely benefit religious organizations); and
- Projects in progress.
- New structures or infrastructure.

There are five minimum criteria that all projects must meet in order to be considered for funding:

- Conforms with the State HMP;
- Provides beneficial impact upon the designated disaster area;
- Conforms with environmental laws and regulations;
- Solves a problem independently or constitutes a functional portion of a solution; and,
- Is cost-effective.

Benefit – Costs Review Listing Table

The projects listed in Table 24 list the benefits or pros of a potential project and the costs or cons of a potential project. The review method is further described in the FEMA *How-To-Guide Benefit-Cost Review in Mitigation Planning* (FEMA 386-5).

Priority Definitions in Table 24:

High = Clearly a life/safety project, or benefits clearly exceed the cost or can be implemented 0 – 1 year.

Medium = More study required to designate as a life/safety project, or benefits may exceed the cost, or can be implemented in 1 – 5 years.

Low = More study required to designate as a life/safety project, or not known if benefits exceed the costs, or long-term project, implementation will not occur for over 5 years.

Table 24. Benefit Cost Review

Action	Vulnerability			Benefit (Pro)	Cost (Cons)	Priority	Responsible Position/ Department
	Before Action is Implemented	After Action is Implemented	Difference				
Goal 1 – Execute Remedial Actions in the Drainage Plan							
a, b, and c	The community of Tanana is impacted from soil erosion, pooling, and flooding after runoff from storm events and spring melt follow topography and terrain altered by man-made development.	Mitigation actions will greatly reduce soil erosion, pooling and flooding.	Flood conditions will be less likely to impact the community and new and repaired culverts will flow with natural drainages.	Deficiencies in drainage conditions from stormwater runoff will be addressed and improvements will be made to existing drainage features.	$314,700	High	City Manager
Action	**Vulnerability**			**Benefit (Pro)**	**Cost (Cons)**	**Priority**	**Responsible Position/ Department**
	Before Action is Implemented	**After Action is Implemented**	**Difference**				
Goal 2 – Build a Community Shelter/Multi-purpose Building							
a	Tanana currently uses the Tanana City School as a community shelter; however, the school is located near the Yukon River and was threatened by the 2009 ice jam flood.	Tanana will have a community shelter/multi-purpose facility	The community shelter will be located above the 500-year floodplain.	Tanana community benefits from a community shelter/multi-purpose facility that can serve as shelter and temporary housing and offices.	Depends on design of the building; estimated at $1.9 million	High	City Manager and NVT Executive Director

b, c and d	The City and Tribal Council uses the Tanana Elders Basement Conference Room, which is not equipped for large community meetings.	Tanana will have a shelter and multipurpose facility large enough for public meetings, which will be accessible. The location will be less likely to be inundated from floods.	The building will provide office space and community meeting space during non-emergencies.				City of Tanana

Action	Vulnerability		Difference	Benefit (Pro)	Cost (Cons)	Priority	Responsible Position/ Department
	Before Action is Implemented	After Action is Implemented					
Goal 3 – Implement Mitigation Objectives Recommended in the Tanana CWPP							
a, b, c, and d	The City of Tanana, NTV, Tozitna Corporation, Tanana Power Company, Alaska Fire Service and Alaska Division of Forestry have implemented 50% of the mitigation objectives recommended in the Tanana CWPP.	The City and its partners in the CWPP obtain funding to implement the mitigation objectives in the CWPP.	With the mitigation actions implemented, Tanana reduces risk of wildland fires and community conflagration fires.	Tanana provides protection of life, safety, and property for members of the community.	Cost to implement all objectives in the CWPP estimated at $112,000, per BLM Alaska Fire Service during the development of the plan.	High	City Manager and Tribal Executive Director
Action	**Vulnerability**		**Difference**	**Benefit (Pro)**	**Cost (Cons)**	**Priority**	**Responsible Position/ Department**
	Before Action is Implemented	**After Action is Implemented**					
Goal 4– Build an Emergency Operations Center: Note the community is no longer interested in this goal, and this goal will be deleted from the next update of the MJHMP.							
a	Tanana lacks a suitable EOC facility with access to communications system, Internet, and interoperable radios.	The City builds a second story to the Fire Station which serves as the EOC and a training center during non-emergencies.	Tanana has a fully-equipped EOC facility that is not vulnerable to flooding.	Tanana can effectively manage emergencies locally and on a sub-regional level with a fully-equipped EOC.	Cost will depend upon design and layout of the EOC and the cost of the equipment and technology. Estimated at $150,000.	Low	City of Tanana

b	The City currently does not have funding to build and to equip an EOC with proper equipment and technology.	The City identifies funding sources for building and equipping an EOC.	See 3a above	See 3a above	See 3a above		City of Tanana
c	Tanana's capabilities are limited for serving other communities during emergencies on a sub-regional level, even though mutual aid agreements in place.	With a fully-equipped EOC, Tanana can manage emergencies on a sub-regional level.	Tanana can be used as an EOC for handling emergencies on a sub-regional level.	See 3a above	See 3A above		City of Tanana
Action	**Vulnerability** **Before Action is Implemented**	**After Action is Implemented**	**Difference**	**Benefit (Pro)**	**Cost (Cons)**	**Priority**	**Responsible Position/ Department**
Goal 5 – Relocate or elevate ~30 homes in Circle Subdivision and Front Street; add to utility grid							
a	Homes located in the Circle Subdivision and 1st Avenue/Front Street are prone to seasonal flooding from snowmelt, poor	Homes elevated or relocated from the Circle Subdivision and Front Street will be protected from recurring seasonal flooding.	The difference will be the mitigated impacts of flooding on 30 homes; the increased safety of the residents, and protection of property.	Residents in the flood-prone areas will benefit from higher, drier, safer locations for their homes and lessen the potential for loss and damage if	Cost dependent on whether homes are relocated and the cost of land in the new location, or the cost of elevating the homes dependent	Medium to High	City Manager and NVT Executive Director

	drainage, and ice jam flooding.			homes are elevated.	upon the size and methods used to elevate the homes.		
Action	**Vulnerability**			**Benefit (Pro)**	**Cost (Cons)**	**Priority**	**Responsible Position/ Department**
	Before Action is Implemented	**After Action is Implemented**	**Difference**				
b	Homes remaining in the Circle Subdivision are not on the City water and sewer; therefore, outhouses which get flooded yearly, increase the potential for sanitation concerns if outhouses are flooded.	Homes connected to the City water and sewers benefit from sanitary waste disposal and lessened risk of human health issues associated with unsanitary conditions.	Healthier, cleaner source for drinking water and proper sewage disposal.	Residents currently living in the Circle Subdivision will benefit from higher, drier living conditions and the reduced health risks associated with contaminated drinking water and exposure to sewage during flood conditions.	Cost dependent upon the number of homes that are hooked up to the City water and sewer.	Medium to High	City Manager and NVT Executive Director
c	Some residents in the Circle Subdivision cannot afford the cost of relocation or elevating their homes	The City and NVT provide funding for those property owners to relocate or elevate their homes in the areas prone to flooding.	Tanana residents protect their homes by relocating or elevating the homes, providing safer environments for their families.	See 2b above	See 2b above	Medium to High	City Manager and NVT Executive Director

Action	Vulnerability		Difference	Benefit (Pro)	Cost (Cons)	Priority	Responsible Position/ Department
	Before Action is Implemented	After Action is Implemented					
Goal 6 – Relocate Radio Repeater to Mission Hill. This action has been completed and will be deleted in next plan update.							
a, b, and c	The new radio repeater in Tanana is not strategically located to maximize the range of communications.	The radio repeater is relocated to Mission Hill to increase the range of communications to reach Ruby and Fairbanks.	Increased range of radio communications.	With expanded range of radio communications, Tanana could better serve neighboring remote villages in the Interior region of Alaska.	Cost to relocate the radio repeater dependent on lease agreements with the property owner on Mission Hill. Estimated at $5,000 for relocation and $1,200/month for electric/heating of facility.	Medium to High	City Manager and NVT Executive Director
Goal 7 - Elevate sewer lift station							
a	There are two lift stations. The east one is in an area where the ~30 homes are to be moved. This manhole needs to be raised in case of flooding.	Risk of the lift station flooding will be mitigated.	Raw sewage will not be spread around the eastern portion of the community.	In the event of a flood, flood waters would enter the lift station, damaging the lift station pumps, resulting in sewage being spread around the eastern portion of the community	$20,000 cost	High	City Manager and NVT Executive Director

				where the ~30 homes are at risk of being flooded.			
Goal 8 - Harvest dead trees							
a	Harvest 100,000 acres of dead trees (due to spruce bark beetle) and use in wood- boiler systems.	An abundance of fuel is present to burn should a fire start.	Less fuel will be available for fire hazard.	The community can burn the removed trees in their wood-boiler systems.	Labor costs and time intensive	High	City Manager and NVT Executive Director
Goal 9 – Elevate portion of evacuation road							
a	Elevate approximately 100 feet of road damaged by inadequate insulation.	This road is plagued by flooding and is the evacuation road between the City and the airport.	The evacuation road will not be impacted by flooding events.	The community will have peace of mind.	Labor and gravel costs	High	City Manager and NVT Executive Director

The Tanana community selected and prioritized their goals and actions in Table 24. Because some of these goals are multi-hazard mitigation goals, all goals were listed in Table 22 and projects in Tables 23 and 24.

Upon adoption of their MJHMP, the City and Tribal Councils will incorporate this MJHMP into their existing planning mechanisms using the following methods:

- Use Tanana's regulatory tools to integrate the mitigation goals and actions. These regulatory tools are identified in Section 2.3 *Local Resources*.
- Encourage authorities to implement MJHMP goals and actions into relevant planning mechanisms.
- Update or amend specific planning mechanisms to integrate MJHMP goals and principles.

Mitigation Projects Table

Table 25 provides the mitigation action plan matrix. Projects are listed by the priority ranked during the benefit cost review process. Additionally, Table 25 identifies agencies that will be responsible for implementing high priority mitigation actions, coordinating departments, identifying available funding sources, and developing a time frame for completion and initial estimated costs. The final column provides a location to identify the progress made on each of these mitigation actions. Mitigation actions currently prioritized as low during benefit cost review were eliminated from the mitigation action plan. All mitigation actions will be re-evaluated during subsequent plan updates.

Table 25. Mitigation Actions by Priority Ranking

Project	Priority	Responsibility	Coordinating Departments	Funding Source	Time-frame	Cost	Progress (as of 2017)
Harvest dead trees	1 – High	City Manager and NVT Executive Director	Tozitna Corporation, Tanana Power Company, Alaska Fire Service, and Alaska Division of Forestry	City, State DOF, BLM Alaska Fire Service	0-2 years	>$500,000	New goal as of 2017
Implement actions within Tanana CWPP 2010	2 - High	City Manager and NVT Executive Director	Tanana Tribal Council, Tozitna, Inc., Tanana Chiefs Conference Forestry Department and DOF	City, State DOF, BLM Alaska Fire Service	0-2 years	$112,000 estimate by BLM Alaska Fire Service	50% completed
Elevate Approximately 100 feet of road damaged by inadequate permafrost	3 - High	City Manager and NVT Executive Director	Public Works	City, State, Federal, and other sources	0-5 years	$100,000	New goal as of 2017
Execute Drainage Plan	4 - High	City Manager and NVT Executive Director	Public Works	City, State, Federal, and other sources	0-5 years	$314,700	50% completed; remainder is dependent on funding
Build a Community Shelter/Multi-Purpose Facility	5 - High	City Manager and NVT Executive Director	Outside contractor	City, DHS&EM, FEMA	0-5 years	$1.9 million	Not implemented
Relocate or elevate ~30 homes in Circle Subdivision and Front Street; add to utility grid	6 – Medium to High	City Manager and NVT Executive Director	City, NVT, Tozitna, Inc.	State, FEMA HMGP	0-5 years	Dependent on whether homes are elevated or	Not implemented due to lack of funding; high

						relocated and cost for hook up to utilities	priority for community
Elevate sewer lift station	7– Medium to High	City of Tanana	Public Works	State, FEMA HMGP	1 year	Dependent on whether homes are moved	New goal as of 2017

Chapter 5. Glossary of Terms

A-Zones

Type of zone found on all Flood Hazard Boundary Maps (FHBMs), Flood Insurance Rate Maps (FIRMs), and Flood Boundary and Floodway Maps (FBFMs).

Acquisition

Local governments can acquire lands in high hazard areas through conservation easements, purchase of development rights, or outright purchase of property.

Asset

Any manmade or natural feature that has value, including, but not limited to people; buildings; infrastructure like bridges, roads, and sewer and water systems; lifelines like electricity and communication resources; or environmental, cultural, or recreational features like parks, dunes, wetlands, or landmarks.

Base Flood

A term used in the National Flood Insurance Program to indicate the minimum size of a flood. This information is used by a community as a basis for its floodplain management regulations. It is the level of a flood, which has a one-percent chance of occurring in any given year. Also known as a 100-year flood elevation or one-percent chance flood.

Base Flood Elevation (BFE)

The elevation for which there is a one-percent chance in any given year that floodwater levels will equal or exceed it. The BFE is determined by statistical analysis for each local area and designated on the Flood Insurance Rate Maps. It is also known as 100-year flood elevation.

Base Floodplain

The area that has a one percent chance of flooding (being inundated by flood waters) in any given year.

Building

A structure that is walled and roofed, principally above ground and permanently affixed to a site. The term includes a manufactured home on a permanent foundation on which the wheels and axles carry no weight.

Building Code

The regulations adopted by a local governing body setting forth standards for the construction, addition, modification, and repair of buildings and other structures for the purpose of protecting the health, safety, and general welfare of the public.

Community

Any state, area or political subdivision thereof, or any Indian tribe or tribal entity that has the authority to adopt and enforce statutes for areas within its jurisdiction.

Community Rating System (CRS)

The Community Rating System is a voluntary program that each municipality or county government can choose to participate in. The activities that are undertaken through CRS are awarded points. A community's points can earn people in their community a discount on their flood insurance premiums.

Critical Facility

Facilities that are critical to the health and welfare of the population and that are especially important during and after a hazard event. Critical facilities include, but are not limited to, shelters, hospitals, and fire stations.

Designated Floodway

The channel of a stream and that portion of the adjoining floodplain designated by a regulatory agency to be kept free of further development to provide for unobstructed passage of flood flows.

Development

Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or of equipment or materials.

Digitize

To convert electronically points, lines, and area boundaries shown on maps into x, y coordinates (e.g., latitude and longitude, universal transverse Mercator (UTM), or table coordinates) for use in computer

Disaster Mitigation Act (DMA)

DMA 2000 (public Law 106-390) is the latest legislation of 2000 (DMA 2000) to improve the planning process. It was signed into law on October 10, 2000. This new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur.

Earthquake

A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of the earth's tectonic plates.

Elevation

The raising of a structure to place it above flood waters on an extended support structure.

Emergency Operations Plan

A document that: describes how people and property will be protected in disaster and disaster threat situations; details who is responsible for carrying out specific actions; identifies the personnel, equipment, facilities, supplies, and other resources available for use in the disaster; and outlines how all actions will be coordinated.

Erosion

The wearing away of the land surface by running water, wind, ice, or other geological agents.

Federal Disaster Declaration

The formal action by the President to make a State eligible for major disaster or emergency assistance under the Robert T. Stafford Relief and Emergency Assistance Act, Public Law 93-288, as amended. Same meaning as a Presidential Disaster Declaration

Federal Emergency Management Agency (FEMA)

A federal agency created in 1979 to provide a single point of accountability for all federal activities related to hazard mitigation, preparedness, response, and recovery.

Flood

A general and temporary condition of partial or complete inundation of water over normally dry land areas from (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from any source, or (3) mudflows or the sudden collapse of shoreline land.

Flood Disaster Assistance

Flood disaster assistance includes development of comprehensive preparedness and recovery plans, program capabilities, and organization of Federal agencies and of State and local governments to mitigate the adverse effects of disastrous floods. It may include maximum hazard reduction, avoidance, and mitigation measures, as well policies, procedures, and eligibility criteria for Federal grant or loan assistance to State and local governments, private organizations, or individuals as the result of the major disaster.

Flood Elevation

Elevation of the water surface above an establish datum (reference mark), e.g. National Geodetic Vertical Datum of 1929, North American Datum of 1988, or Mean Sea Level.

Flood Hazard

Flood Hazard is the potential for inundation and involves the risk of life, health, property, and natural value. Two reference base are commonly used: (1) For most situations, the Base Flood is that flood which has a one-percent chance of being exceeded in any given year (also known as the 100-year flood); (2) for critical actions, an activity for which a one-percent chance of flooding would be too great, at a minimum the base flood is that flood which has a 0.2 percent chance of being exceeded in any given year (also known as the 500-year flood).

Flood Insurance Rate Map

Flood Insurance Rate Map (FIRM) means an official map of a community, on which the Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community.

Flood Insurance Study

Flood Insurance Study or Flood Elevation Study means an examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluations and determination of mudslide (i.e., mudflow) and/or flood-related' erosion hazards.

Floodplain

A "floodplain" is the lowland adjacent to a river, lake, or ocean. Floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 10-year floodplain will be covered by the 10-year flood. The 100-year floodplain by the 100-year flood.

Floodplain Management

The operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works and floodplain management regulations.

Floodplain Management Regulations

Floodplain Management Regulations means zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as floodplain ordinance, grading ordinance and erosion control ordinance) and other applications of police power. The term describes such state or local regulations, in any combination thereof, which provide standards for the purpose of flood damage prevention and reduction.

Flood Zones

Zones on the Flood Insurance Rate Map (FIRM) in which a Flood Insurance Study has established the risk premium insurance rates.

Flood Zone Symbols

A - Area of special flood hazard without water surface elevations determined.

A1-30 - AE Area of special flood hazard with water surface elevations determined.

AO - Area of special flood hazard having shallow water depths and/or unpredictable flow paths between one and three feet.

A-99 - Area of special flood hazard where enough progress has been made on a protective system, such as dikes, dams, and levees, to consider it complete for insurance rating purposes.

AH - Area of special flood hazard having shallow water depths and/or unpredictable flow paths between one and three feet and with water surface elevations determined.

B - X Area of moderate flood hazard.

C - X Area of minimal hazard.

D - Area of undetermined but possible flood hazard.

Geographic Information System (GIS)

A computer software application that relates physical features of the earth to a database that can be used for mapping and analysis.

Governing Body

The legislative body of a municipality that is the assembly of a borough or the council of a city.

Hazard

A source of potential danger or adverse condition. Hazards in the context of this plan will include naturally occurring events such as floods, earthquakes, tsunami, coastal storms, landslides, and wildfires that strike populated areas. A natural event is a hazard when it has the potential to harm people or property.

Hazard Event

A specific occurrence of a particular type of hazard.

Hazard Identification

The process of identifying hazards that threaten an area.

Hazard Mitigation

Any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards. (44 CFR Subpart M 206.401)

Hazard Mitigation Grant Program

The program authorized under section 404 of the Stafford Act, which may provide funding for mitigation measures identified through the evaluation of natural hazards conducted under §322 of the Disaster Mitigation Act 2000.

Hazard Profile

A description of the physical characteristics of hazards and a determination of various descriptors including magnitude, duration, frequency, probability, and extent. In most cases, a community can most easily use these descriptors when they are recorded and displayed as maps.

Hazard and Vulnerability Analysis

The identification and evaluation of all the hazards that potentially threaten a jurisdiction and analyzing them in the context of the jurisdiction to determine the degree of threat that is posed by each.

Mitigate

To cause something to become less harsh or hostile, to make less severe or painful.

Mitigation Plan

A systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards typically present in the State and includes a description of actions to minimize future vulnerability to hazards.

National Flood Insurance Program

The Federal program, created by an act of Congress in 1968 that makes flood insurance available in communities that enact satisfactory floodplain management regulations.

One Hundred (100)-Year

The flood elevation that has a one-percent chance of occurring in any given year. It is also known as the Base Flood.

Planning

The act or process of making or carrying out plans; the establishment of goals, policies, and procedures for a social or economic unit.

Repetitive Loss Property

A property that is currently insured for which two or more National Flood Insurance Program losses (occurring more than ten days apart) of at least $1000 each have been paid within any 10-year period since 1978.

Risk

The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to a specific type of hazard event. It can also be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Riverine

Relating to, formed by, or resembling rivers (including tributaries), streams, creeks, brooks, etc.

Riverine Flooding

Flooding related to or caused by a river, stream, or tributary overflowing its banks due to excessive rainfall, snowmelt or ice.

Runoff

That portion of precipitation that is not intercepted by vegetation, absorbed by land surface, or evaporated, and thus flows overland into a depression, stream, lake, or ocean (runoff, called immediate subsurface runoff, also takes place in the upper layers of soil).

Seiche

An oscillating wave (also referred to as a seismic sea wave) in a partially or fully enclosed body of water. May be initiated by landslides, undersea landslides, long period seismic waves, wind and water waves, or a tsunami.

Seismicity

Describes the likelihood of an area being subject to earthquakes.

State Disaster Declaration

A disaster emergency shall be declared by executive order or proclamation of the Governor upon finding that a disaster has occurred or that the occurrence or the threat of a disaster is imminent. The state of disaster emergency shall continue until the governor finds that the threat or danger has passed or that the disaster has been dealt with to the extent that emergency conditions no longer exist and terminates the state of disaster emergency by executive order or proclamation. Along with other provisions, this declaration allows the governor to utilize all available resources of the State as reasonably necessary, direct and compel the evacuation of all or part of the population from any stricken or threatened area if necessary, prescribe routes, modes of transportation and destinations in connection with evacuation and control ingress and egress to and from disaster areas. It is required before a Presidential Disaster Declaration can be requested.

Topography

The contour of the land surface. The technique of graphically representing the exact physical features of a place or region on a map.

Tribal Government

A Federally recognized governing body of an Indian or Alaska native Tribe, band, nation, pueblo, village or community that the Secretary of the Interior acknowledges to exist as an Indian tribe under the Federally Recognized Tribe List Act of 1994, 25 U.S.C. 479a. This does not include Alaska Native corporations, the ownership of which is vested in private individuals.

Tsunami

A sea wave produced by submarine earth movement or volcanic eruption with a sudden rise or fall of a section of the earth's crust under or near the ocean. A seismic disturbance or landslide can displace the water column, creating a rise or fall in the level of the ocean above. This rise or fall in sea level is the initial formation of a tsunami wave.

Vulnerability

Describes how exposed or susceptible to damage an asset it. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. The vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power – if an electrical substation is flooded, it will affect not only the substation itself, but a number of businesses as well. Other, indirect effects can be much more widespread and damaging than direct ones.

Vulnerability Assessment

The extent of injury and damage that may result from hazard event of a given intensity in a given area. The vulnerability assessment should address impacts of hazard events on the existing and future built environment.

Watercourse

A natural or artificial channel in which a flow of water occurs either continually or intermittently.

Watershed

An area that drains to a single point. In a natural basin, this is the area contributing flow to a given place or stream.

Chapter 6. Bibliography

Division of Community and Regional Affairs (DCRA) Community Information: https://www.commerce.alaska.gov/web/dcra/communityinformation.aspx

Alaska Critical Facilities Inventory, FEMA-TO 08-J-0011, December 2008

Tanana Community Wildfire Protection Plan, promulgated in 2011

Tanana Community Priority Plan, July 2010

City of Tanana, Alaska Preliminary Drainage Plan, February 2011

Tanana Solid Waste Management Plan, February 2009

Tanana Tribal Council Emergency Response Plan, 2009

Alaska Interagency Fire Management Plan, Tanana/Minchumina Area and Environmental Analysis, March 1982

FEMA How to Guides:

a. *Getting Started: Building Support For Mitigation Planning* (FEMA 386-1)
b. *Local Mitigation Planning Handbook*, March 1, 2013
c. *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA 386-2)
d. *Developing The Mitigation Plan: Identifying Mitigation Actions And Implementing Strategies* (FEMA 386-3)
e. *Bringing the Plan to Life: Implementing the Hazard Mitigation Plan* (FEMA 386-4)
f. *Using Benefit-Cost Review in Mitigation Planning* (FEMA 386-5)

USGS Earthquake Probability Mapping: https://earthquake.usgs.gov/hazards/hazmaps/

Western Regional Climate Center, Temperature and Precipitation Summary: https://wrcc.dri.edu/coopmap/#

Alaska Interagency Wildlife Management: http://fire.ak.blm.gov/predsvcs/maps.php

Web Sites with General Hazard Planning Information

American Planning Association: http://www.planning.org

Association of State Floodplain Managers: http://www.floods.org

Federal Emergency Management Agency: http://www.fema.gov

Community Rating System: http://www.fema.gov/national-flood-insurance-program-community-rating-system

Flood Mitigation Assistance Program: https://www.fema.gov/flood-mitigation-assistance-grant-program

Hazard Mitigation Grant Program:	http://www.fema.gov/hazard-mitigation-grant-program
Individual Assistance Program:	http://www.fema.gov/individual-assistance-program-tools
Interim Final Rule:	https://www.fema.gov/media-library/assets/documents/4590
Public Assistance Program:	http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit/

Appendix A: Public Involvement

Hazard Mitigation Plan Update for Tanana, Alaska

Newsletter #1: November 2017

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 update the 2011 hazard mitigation plan (HMP) for the City of Tanana. This plan will assist the City as a valuable resource tool in making decisions. Additionally, communities must have a State- and FEMA-approved and community-adopted HMP plan to receive FEMA pre- and post- disaster grants.

LeMay Engineering & Consulting, Inc. was contracted to assist Tanana with preparing a 2017 HMP update. The HMP will identify all applicable natural hazards. The plan will identify the people and facilities potentially at risk and ways to mitigate damage from future hazard impacts.

Join the planning team and offer your advice: Any interested community member may join the planning team. To join, call or send Jennifer LeMay an email at jlemay@lemayengineering.com. The purpose of this newsletter is to introduce this project and encourage public involvement during this process. The goal is to receive comments, identify key issues or concerns, and improve mitigation ideas.

Attend the November 15, 2017, Community Introductory Meeting at 7 pm at City Hall: The agenda will be a summary of the hazard mitigation plan process by Patrick LeMay. You're invited to provide input to the plan. Specifically, we'll be discussing which of the following hazards are realistic for Tanana: earthquake, tsunami, flood/erosion, ground failure/avalanche, severe weather, wildland fire, and climate change? Also, what facilities are critical to your community?

For more information, contact:

Jeff Weltzin, City Manager (907) 590-1304
Shannon Erhart, Tribal Executive Director (907) 366-7160, ext 200
Patrick LeMay, PE, Planner (907) 250-9038
Jennifer LeMay, PE, PMP, Lead Planner (907) 350-6061
Brent Nichols, DMVA, DHS&EM Project Manager (907) 428-7085

November 15, 2017

Brent Nichols, CFM
State of Alaska
DMVA DHS&EM
P.O. Box 5750
Joint Base Elmendorf-Richardson, Alaska 99505-5750

Mr. Nichols:

This letter serves as the City of Tanana's Letter of Commitment to support DMVA DHS&EM and LeMay Engineering & Consulting, Inc. in their Federal Emergency Management Agency (FEMA) Pre-Disaster Mitigation (PDM) planning grant to update the 2011 hazard mitigation plan for the City of Tanana. The end goal of this grant is a State- and FEMA- approved hazard mitigation plan that the City of Tanana will adopt.

Sincerely,

Jeff Weltzin
Tanana City Manager

"WHERE THE TWO RIVERS MEET"

TANANA TRIBAL COUNCIL

PO Box 130, Tanana, AK 99777

Phone: (907) 366-7160 or 7170 Fax: (907) 366-7195

November 15, 2017

Brent Nichols, CFM
State of Alaska
DMVA DHS&EM
PO Box 5750
Joint Base Elmendorf-Richardson, Alaska 99505-5750

Mr. Nichols:

This letter serves as the Tanana Tribal Council's letter of Commitment to support DMVA DHS&EM and LeMay Engineering & Consulting, Inc. in their Federal Emergency Management Agency (FEMA) Pre-Disaster Mitigation (PDM) planning grant to update the 2011 hazard mitigation plan for the City/Tribe of Tanana. The end goal of this grant is a State-and FEMA-approved hazard mitigation plan that the Tanana Tribe will adopt.

Sincerely,

Helium Edwardsen, Chairman/Chief

Tanana Tribe Hazard Mitigation Plan Committee Introductory Meeting

November 15, 2017

After Noon

~~Morning~~ Meeting at Tribal Office

Name	Organization	Contact Information (phone or email)
Patrick M. LeMay, PE	LeMay Engineering & Consulting, Inc	907, 250.9038
Helen Edwardsen	Tanana Native Council	Una edwardsen@gmail.com 371-6327
Curtis Sommer	Tanana Native Council	Csommer@tananatribe.org 907-366-1009
Shannon Erhart	Tanana Native Council	serhart@tananatribe.org 907-366-7160 ext 200

City of Tanana Hazard Mitigation Plan Committee Introductory Meeting

November 15, 2017

Morning

~~Mid-Day~~ Meeting at City Office

Name	Organization	Contact Information (phone or email)
Jeff Weltzin	City of Tanana	590-1304
Patrick M. LeMay, PE	LeMay Engineering & Consulting, Inc	250-9038
Pat Moore U.a phone	City Council IN Fairbanks on Med EG	366-1054

City of Tanana Hazard Mitigation Plan Committee Introductory Meeting

November 15, 2017

7 pm City Council Meeting at City Office

7pm → 10pm

Name	Organization	Contact Information (phone or email)
Patrick M. LeMay, PE	LeMay Engineering & Consulting, Inc.	patrick.lemay@lemayengineering.com
Patty Elias	Community Member	366-1159
Shannon Erhart	Tanana Tribal Council	serhart@tananatribe.org
Michael Ashton	City of Tanana,	907-205-0411
Jody Potts	TCC VPSO	452-8251 ext. 5236
Florence Folger	Tanana Resident	9073661136
Dennis Morton	AKTCSD	907677-2337
Terrie R May	AKTCSD	907 366-1242
Jeff May	AKTCSD	907-366-1242
Amy Brower	AKTCSD	907-366-1255
Randall Brower	AKTCSD	907-366-1055
Marty Scharf	Resident	366-7135
Ralph Eller	Tanana Power Co	366-1190
John Huntington		366-1177

Tanana City Council Meeting

November 15, 2017

Name	Organization	Contact Information (phone or email)
Nichole Keith	COT	366-1057
Jeff Weltzin	COT	590-1324
Arella Dennison	COT	907-328-8687
Lisa K Huntington		
Dayne Fleger		
[illegible]	CP	
Pat Moore Via phone	City Council IN Fairbanks on Med Eng.	366-1054

CITY OF TANANA

REGULAR CITY COUNCIL MEETING
November 15, 2017 (Wednesday)

AGENDA

TANANA CITY CONFERENCE ROOM
7:00 PM

I. CALL TO ORDER
II. ROLL CALL
III. COMMENTS FROM THE PUBLIC/AUDIENCE, & CORRESPONDENCE

IV. REVIEW AND APPROVE PREVIOUSMEETING MINUTES AND SETTING OF NEXT MEETING DATE AND TIME
V. REVIEW AND APPROVE CITY COUNCIL MEETING AGENDA
VI. CITY MANAGER'S REPORT REVIEW, STAFF REPORTS AND QUESTIONS:
1. Hazard Mitigation Plan Update
2. TCC VPSO Report – Jody Potts
3. Tanana Power Company Communications Timeline and Next Steps

VII. REVIEW AND APPROVE CITY'S FINANCIAL REPORTS
1. YEAR TO DATE PROFIT AND LOSS BEVERAGE CENTER
2. REVIEW CREDIT CARD STATEMENT
3. BANK STATEMENTS
4. YEAR TO DATE REVENUE AND EXPENSES

VIII. NEW BUSINESS
1. USDA High Cost Energy Program Application Resolution
2. CDBG Public Hearing Comments Review and Project Selection Resolution
3. Food To School Funding Application Resolution
4. FY2018 Wood Innovation Funding Application Resolution
5. TIGER Application Letter of Support from Council Members
6. New Check Signers Resolution
7. Xmas Dinner
8. City Manager Evaluation – future executive session – set date

IX. OLD BUSINESS
1. Dog Ordinance Third Hearing and Action

IX. COUNCIL COMMENTS:

XI. TIME AND DATE OF NEXT CITY COUNCIL MEETING

XII. ADJORNMENT

Hazard Mitigation Planning Process

Updates to existing plans

Plans must be updated every five years and approved by DHS&EM and FEMA and then adopted by the community by resolution for the community to remain eligible for FEMA grant funding

This is a public process. Everyone who wants to be involved will be given the opportunity to be involved in this process. Send Jennifer LeMay, PE, PMP an email if you'd like more information at jlemay@lemayengineering.com or call her at (907) 350-6061.

We welcome public input and will have a public comment hearing at a public meeting for you to provide input on the plan.

Which hazards are applicable for your community?

- Flood
- Erosion
- Wildland Fire
- Tsunami/Seiche
- Earthquake
- Volcano
- Avalanche
- Ground Failure/Landslide
- Permafrost Degradation
- Severe Weather
- Climate Change

We're interested in information related to:

- hazard identification,
- profiles,
- previous occurrences,
- probability of occurrences, and
- typical recurrence intervals

for each potential hazard.

Plan Process

- Today's introductory meeting
- Gathering of data
- Draft Plan available for public comment (December is our goal month)
- Public hearing for Draft Plan (public comment period)
- State/FEMA review and pre-approval
- Newsletter announcing Final Plan (the public may still comment)
- City and/or Tribal adoption
- Final Approval from State/FEMA (prior to April 23, 2018).

After Plan is completed, approved, and adopted, your community will be eligible to apply for mitigation project funds from DHS&EM and FEMA for five years until the plan requires another update.

Contacts:
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Jennifer LeMay, PE, PMP LeMay Engineering & Consulting, Inc. Planner (907) 350-6061
Brent Nichols, CFM, State of Alaska DHS&EM Hazard Mitigation Officer (907) 428-7085

Patrick M. LeMay, P.E.
President
4272 Chelsea Way
Anchorage, AK 99504
(907) 250-9038
patrick.lemay@lemayengineering.com

November 16, 2017

Brent A. Nichols, EMSII, CFM
Emergency Management Specialist (EMS) II & Certified Floodplain Manager (CFM)
Department of Military and Veterans Affairs (DMVA)
Division of Homeland Security and Emergency Management (DHS&EM)
P.O. Box 5750
JBER, AK 99505-5750

Subject: **Hazard Mitigation Planning Process Trip Report**
City of Tanana and the Tanana Tribal Council, Alaska

On November 15, 2017, Patrick M. LeMay, PE of LeMay Engineering & Consulting, Inc. traveled to Tanana, Alaska. The purpose of this trip was to conduct an introductory meeting, gather hazard data, review with community leaders the applicable hazards for the area, review potential mitigation strategies, and update the critical facilities within the community.

Three meetings occurred during the site visit. A Tanana Tribal Hazard Mitigation Plan Committee Introductory Meeting occurred from 10 AM to 2:00 PM and included:

Patrick M. LeMay, PE	LeMay Engineering & Consulting, Inc.
First Chief Helium Edwardsen	Tanana Native Council
Curtis Sommer	Tanana Native Council
Shannon Erhart	Tanana Native Council

A City of Tanana Mitigation Plan Committee Introductory Meeting with the City Council (Public) from 7 PM to 10 PM included the City Council and the Public with 21 of 25 people willing to sign in. The City Council allowed for a 15-minute presentation of the process and goals along with questions from the council and public. A City-Wide Christmas Party is planned for 7 PM on December 19, 2017 and everyone agreed that this venue would be a good opportunity for a presentation of the Draft Mitigation Plan.

On the morning of November 16, a Mitigation Plan Committee Introductory Meeting with the City and one Council member occurred via phone. Meeting attendees included:

Patrick M. LeMay, PE	LeMay Engineering & Consulting, Inc.
Jeff Weltzin	Tanana City Administrator
Pat Moore	City Council Member

The meetings resulted in valuable information to update the Tanana Hazard Mitigation Plan to include local climate change issues and mitigation action strategies. Both the City and Tribal entities work great together and want to participate in this HMP Update.

If you have any questions, please do not hesitate to call me at (907) 250-9038.

11/16/17

Patrick M. LeMay, P.E./Date
LeMay Engineering & Consulting, Inc.

jlemay@lemayengineering.com

From: jlemay@lemayengineering.com
Sent: Friday, December 15, 2017 2:49 PM
To: 'Jeff Weltzin'; 'Shannon Erhart'
Cc: 'Patrick LeMay'
Subject: Tanana Draft HMP Update
Attachments: Tanana Newsletter Number 2.pdf; 171213 Tanana HMP Update.pdf

Good afternoon, Jeff and Shannon:

Please review attached Draft HMP Update and distribute to those that may be interested in reviewing.

Comments can be emailed to me or provided by phone. Additionally, Patrick LeMay will be at the December 22 Community Christmas Party and would be happy to take comments then. Please post the attached flyer in visible places such as the bulletin board at the store, library, City Office, and Tribal Office to encourage local community members to participate in this process.

Feel free to contact either Patrick or I with questions, comments, or concerns.

Thank you.

Jennifer LeMay, PE, PMP
Vice President
(907) 350-6061

LeMay Engineering
& Consulting, Inc.

jlemay@lemayengineering.com

From: jlemay@lemayengineering.com
Sent: Monday, April 2, 2018 3:38 PM
To: 'hedwardsen@tananatribe.org'
Subject: Tanana Hazard Mitigation Plan
Attachments: 180402 Tanana HMP Update.pdf

Good afternoon, Helium,

Thank you for speaking with me today. I've forwarded two emails to Shannon Erhart that I was referencing in our conversation below.

Considering you and other NVT members were active in the public meetings, I believe this plan represents both the City and Tribe adequately. I've attached the plan. Feel free to review and distribute, and forward comments to me as I can incorporate them before the City and Tribe are asked to adopt the plan once FEMA has completed its review.

Thank you.

Jennifer

Jennifer LeMay, PE, PMP
Vice President
(907) 350-6061

LeMay Engineering & Consulting, Inc.

From: jlemay@lemayengineering.com <jlemay@lemayengineering.com>
Sent: Thursday, March 29, 2018 4:21 PM
To: 'Shannon Erhart' <serhart@tananatribe.org>
Subject: FW: Tanana Draft HMP Update

Good afternoon, Shannon,

I've received comments from FEMA on the Draft Plan which are very minimal. I have one question for you. FEMA wanted to know if you emailed out copies of the plan to stakeholders and interested parties before the Christmas party (if so, can you forward me the email) or did you hand out hard copies and to whom?

Thanks,

Jennifer

Jennifer LeMay, PE, PMP

Vice President
(907) 350-6061

LeMay Engineering & Consulting, Inc.

From: jlemay@lemayengineering.com <jlemay@lemayengineering.com>
Sent: Friday, December 15, 2017 2:49 PM
To: 'Jeff Weltzin' <jeffreyweltzin@gmail.com>; 'Shannon Erhart' <serhart@tananatribe.org>
Cc: 'Patrick LeMay' <patrick.lemay@lemayengineering.com>
Subject: Tanana Draft HMP Update

Good afternoon, Jeff and Shannon:

Please review attached Draft HMP Update and distribute to those that may be interested in reviewing.

Comments can be emailed to me or provided by phone. Additionally, Patrick LeMay will be at the December 22 Community Christmas Party and would be happy to take comments then. Please post the attached flyer in visible places such as the bulletin board at the store, library, City Office, and Tribal Office to encourage local community members to participate in this process.

Feel free to contact either Patrick or I with questions, comments, or concerns.

Thank you.

Jennifer LeMay, PE, PMP
Vice President
(907) 350-6061

LeMay Engineering & Consulting, Inc.

Hazard Mitigation Plan Update for Tanana, Alaska

Newsletter #2: December 2017

You're Invited to Comment on the Plan: The goal of this newsletter is to announce the availability of the Draft Plan Update and invite you to provide comments, identify key issues or concerns, and improve mitigation ideas. This plan has been posted at City Hall and the Tribal Office for your review. The Draft Plan Update can also be emailed to you by request. Requests for plans as well as comments can be provided verbally to Jennifer LeMay at (907) 350-6061 or emailed at jlemay@lemayengineering.com.

Attend the December 22, 2017 at 6 pm, Joint City of Tanana and Native Village of Tanana Christmas Party at the school. A Public Hearing on the Draft Plan Update will be part of the party.

For more information, contact:
Jeff Weltzin, City Manager (907) 590-1304
Shannon Erhart, Tribal Executive Director (907) 366-7160, ext 200
Patrick LeMay, PE, Planner (907) 250-9038
Jennifer LeMay, PE, PMP, Lead Planner (907) 350-6061
Brent Nichols, DMVA, DHS&EM Project Manager (907) 428-7085

Joint Hazard Mitigation Plan Draft Comment Period

December 22, 2017

7 pm

Name	Organization	Contact Information (phone or email)
Patrick M LeMay, PE	LeMay Engineering & Consulting, Inc.	patrick.LeMay@LeMayEngineering.com
John Farr	LeMay Engineering & Consulting, Inc.	john.farr@lemayengineering.com
Roxanne Kennedy	Public	roccah@Hotmail.com
Clifton Wiehl	City	cliffwiehl@yahoo.com
Miranda Wiehl	Public	mirandawiehl@yelou.com
Stacy Moore	Public	stacyfolger85@hotmail.com
Kate Grace	Clinic	907-366-1275
Randall Brower	TCSD	randall brower@yahoo.com 907-366-1055
Amy Brower	TCSD	amy brower@yahoo.com 907-366-1225
Michael Ashton	City	alaskaarcher@alaskan.com 907-305-0411
M. Therese Ashton	T School	
Jeffrey M. May	T. School	jmay@aktcsd.org
Tonia May	T School	tmay@aktcsd.org
Corinna Moore	Tanana School Public	corinnamoore99777@gmail.com

Name	Organization	Contact Information (phone or email)
Evan Hahn		evanhahn93@yahoo.com
J Campbell	CITY OF TANANA COUNCIL	907-366-7160
Patrick Moore	city council	366-1054
Lorene Moore	The Mean one Inc.	366-7129
Logan Sanford	TANANA Comm CC.	366-1111
Leah Sanford	"	"

Name	Organization	Contact Information (phone or email)
Ariella Demientieff	Tanana City School	907-328-8687
Faith Peters	Tanana Tribe	907-366-1030
Katlyn Zuray	Alyeska Pipeline	907 750 7142
Charlie Wright	Toghatnc	366-1087
STAN ZURAY	INDEPENDANT	366 7114
Raymond Thyslop	Tanana City School	(907) 987-9439 cell (907) 366-7124 home
Lester Erhart	TANANA ALASKA	907 366 7131 907 366 1034
Christine Erhart	Tanana Tribe	907 366-7172 christine.erhart@yahoo.com
John Erhart	Erhart Kennels	907-366-1158 cell Home 907-366-7172
Kathleen Zuray	Tanana Tribal Council	907-366-7114
Courtney Agnes	Tanana Tribe Tanana City School	907-366-7203
Barbara George	City of Tanana	(907) 366 7159

Name	Organization	Contact Information (phone or email)
Dayna Folger		907-321-1011
Phyllis Erhart		pearhart@tananatribe.org

Name	Organization	Contact Information (phone or email)
Helen Peters		
John Huntington		366-7151
Lois Huntington		366-7151 ~~[illegible]~~
Daphne Huntington		444-5404
Jacqueline Edem		388-7609
Anjoli Anderson		3061288
Ruth Althoff		366-7111
Shirley Nicholia		366 1035
Mary E Starr		366-7251 – house 366-1047 cell
Barbara Martin		366-1018 cell

LeMay Engineering & Consulting, Inc.

Patrick M. LeMay, P.E.
President
4272 Chelsea Way
Anchorage, AK 99504
(907) 250-9038
patrick.lemay@lemayengineering.com

December 22, 2017

Brent A. Nichols, EMSII, CFM
Emergency Management Specialist (EMS) II & Certified Floodplain Manager (CFM)
Department of Military and Veterans Affairs (DMVA)
Division of Homeland Security and Emergency Management (DHS&EM)
P.O. Box 5750
JBER, AK 99505-5750

Subject: **Hazard Mitigation Planning Process Trip Report**
City of Tanana and the Tanana Tribal Council, Alaska

On 22, 2017, Patrick M. LeMay, PE and John Farr, EIT of LeMay Engineering & Consulting, Inc. traveled to Tanana, Alaska. The purpose of this trip was to conduct a public review and comment meeting. A short talk was given on the highlights of the plan to include mitigation goals and potential actions needed. One comment was collected after the meeting, resulting in the addition of a mitigation action for the evacuation road to the airport to be protected from flooding and inadequate insulation.

The public meeting was held during the Community Christmas Party at the request of the City of Tanana and the Native Village of Tanana. There were 44 people that signed into the meeting with many more in attendance.

If you have any questions, please do not hesitate to call me at (907) 250-9038.

12/22/17
Patrick M. LeMay, P.E./Date
LeMay Engineering & Consulting, Inc.

Appendix B: Area Use Map

AREA USE MAP
TANANA

65° 10' 23" N 152° 06' 00" W (NAD 83)
Approximate Elevation: 232' at Tanana Airport ALCAP TAS-401
Township 4 North, Range 22 West, F.M., AK
U.S.G.S. Quadrangles "TANANA A-4 & A-5", Alaska
FT GIBBON RECORDING DISTRICT

SEE SHEETS 1-3 FOR DETAILED COMMUNITY MAPS

0 600 1200 1800
SCALE IN FEET

SCALE: 1"=600'
Date of Photography: June 17, 2009
Magnetic Declination computed by U.S.G.S. Geomag Program using WMM-2005.COF model as of August 1, 2009

SHEET 4 of 5

Legend & Notes

ANCSA 17(b) Easements
Underground Electric & Telephone
Underground Electric

MAP NOTES

This map was prepared by the Alaska Department of Commerce, Community, and Economic Development, Division of Community and Regional Affairs (Commerce) using funding from the Denali Commission - Transportation Program and the Initiative for Accelerated Infrastructure Development (IAID). The IAID is supported by grants from the Denali Commission, USDA Rural Development, Alaska Department of Transportation and Public Facilities and Commerce. Commerce contracted with Global Positioning Services, Inc. in August of 2009 to prepare the map.

Magnetic North 19 1/2° E
True North

APPROXIMATE LOCATION
25' Existing Access Trail
EIN 23a C5

SEC. 4
I.C. No. 1461
Tozitna, Limited

SEC. 3
I.C. No. 1461
Tozitna, Limited

SEC. 2
I.C. No. 1461
Tozitna, Limited

SEC. 1
I.C. No. 1461
Tozitna, Limited

BEAR CREEK

TANANA CITY BOUNDARY

SEC. 6
Gov't Lot 4
I.C. No. 1038
Tozitna, Limited

T 4 N., R. 23 W.
T 4 N., R. 22 W.

SEC. 7
Gov't Lot 1
I.C. No. 1038
Tozitna, Limited

SEC. 7
Gov't Lot 2
I.C. No. 1038
Tozitna, Limited

SEC. 7
Gov't Lot 4
I.C. No. 1038
Tozitna, Limited

SEC. 7
Gov't Lot 5
I.C. No. 1038
Tozitna, Limited

SEC. 7
Gov't Lot 6
I.C. No. 1038
Tozitna, Limited

SEC. 7
Gov't Lot 7
I.C. No. 1038
Tozitna, Limited

SEC. 10
I.C. No. 1038
Tozitna, Limited

SEC. 11
I.C. No. 1090
Tozitna, Limited

SEC. 12
I.C. No. 1038
Tozitna, Limited

SEC. 9
I.C. No. 1038
Tozitna, Limited

APPROXIMATE LOCATION
25' Existing Access Trail
EIN 23a C5

SEC. 10
Gov't Lot 1
I.C. No. 1038
Tozitna, Limited

SEC. 10
Gov't Lot 2
I.C. No. 1038
Tozitna, Limited

SEC. 10
Gov't Lot 3
I.C. No. 1038
Tozitna, Limited

SEC. 11
Gov't Lot 1
I.C. No. 1090
Tozitna, Limited

SEC. 11
Gov't Lot 2
I.C. No. 1090
Tozitna, Limited

SEC. 11
Gov't Lot 3
I.C. No. 1090
Tozitna, Limited

SEC. 11
Gov't Lot 4
I.C. No. 1090
Tozitna, Limited

SEC. 12
Gov't Lot 1
I.C. No. 1038
Tozitna, Limited

SEC. 12
Gov't Lot 2
I.C. No. 1038
Tozitna, Limited

SEC. 12
Gov't Lot 3
I.C. No. 1038
Tozitna, Limited

USS 5958
8
I.C. No. 1090
Tozitna, Limited

Landfill
Shooting Range
Old Landfill

SEC. 14
Gov't Lot 1
I.C. No. 1090
Tozitna, Limited

SEC. 13
Gov't Lot 2
I.C. No. 1038
Tozitna, Limited

SEC. 13
Gov't Lot 1
I.C. No. 1038
Tozitna, Limited

Ralph M. Calhoun Memorial Airport
Tract I
Plat No. 2009-2
QCD from U.S.
10/1/1965

SEC. 15
Gov't Lot 11
I.C. No. 1038
Tozitna, Limited

SEC. 15
Gov't Lot 10
I.C. No. 1038
Tozitna, Limited

SEC. 15
Gov't Lot 8
I.C. No. 1038
Tozitna, Limited

SEC. 14
Gov't Lot 11
I.C. No. 1090
Tozitna, Limited

USS 5958
7
ANS 161

FAA VOR Site

APPROXIMATE LOCATION
80' Wide Existing Road, Powerline, and Communication Cable Easement
EIN 5 C3, C5, D9

Old Landfill

SEC. 15
Gov't Lot 9
I.C. No. 1038
Tozitna, Limited

SEC. 15
Gov't Lot 13
I.C. No. 1038
Tozitna, Limited

USS 10765
NA Cert. 50-96-0137

USS 10765
2
NA Cert. 50-96-0479

Tanana Airport
Tract I
Plat No. 2009-2

SEC. 16
I.C. No. 1038
Tozitna, Limited

SEC. 15
Gov't Lot 12
I.C. No. 1038
Tozitna, Limited

FAA VOR Site

15 13 14
ANS 161

USS 5958
16
I.C. No. 1090
Tozitna, Limited

YUKON RIVER

APPROXIMATE LOCATION
80' Wide Existing Road, Powerline, and Communication Cable Easement
EIN 5 C3, C5, D9

Tract II

BLM Facility

FAA Weather Building

APPROXIMATE LOCATION
20' Wide Existing Powerline and Communication Cable Easement
EIN 5h C3, C5, D9
60' Existing Access Road Esmt. Communication Cable Easement
EIN 5g C3, C5, D9

SEC. 16
Gov't Lot 1
I.C. No. 1038
Tozitna, Limited

SEC. 15
Gov't Lot 14
I.C. No. 1038
Tozitna, Limited

SEC. 14
Gov't Lot 5
I.C. No. 1090
Tozitna, Limited

SEC. 14
Gov't Lot 4
I.C. No. 1090
Tozitna, Limited

BULL ISLAND

SEC. 14
Gov't Lot 3
I.C. No. 1090
Tozitna, Limited

SEC. 13
Gov't Lot 2
I.C. No. 1038
Tozitna, Limited

Permit, Avigation and Hazard Esmt. and Right-of-way to SOA DOT&PF
Bk. 7, Pgs. 592-596
7/12/1985

State Shop

Tanana Jail

ASLS 81-145
Plat No. 82-3

Barge Landing

APPROXIMATE LOCATION
2000' Radius Existing Restrictive Use Esmt.
EIN 27, C4, I

SEC. 16
Gov't Lot 2
I.C. No. 1038
Tozitna, Limited

TANANA AREA USE MAP SHEET 1 1"=600' (2009 PHOTOGRAPHY)

AREA USE MAP
TANANA

65° 10' 23" N 152° 06' 00" W (NAD 83)
Approximate Elevation: 232' at Tanana Airport ALCAP TAS-401
Township 4 North, Range 22 West, F.M., AK
U.S.G.S. Quadrangles "TANANA A-4 & A-5", Alaska
FT GIBBON RECORDING DISTRICT

SEE SHEETS 1-3 FOR DETAILED COMMUNITY MAPS

0 600 1200 1800
SCALE IN FEET

SCALE: 1"=600'
Date of Photography: June 17, 2009
Magnetic Declination computed by U.S.G.S. Geomag Program using WMM-2005.COF model as of August 1, 2009

SHEET 5 of 5

Legend & Notes

Electric & Telephone

ANCSA 17(b) Easements

MAP NOTES

This map was prepared by the Alaska Department of Commerce, Community, and Economic Development, Division of Community and Regional Affairs (Commerce) using funding from the Denali Commission – Transportation Program and the Initiative for Accelerated Infrastructure Development (IAID). The IAID is supported by grants from the Denali Commission, USDA Rural Development, Alaska Department of Transportation and Public Facilities and Commerce. Commerce contracted with Global Positioning Services, Inc. in August of 2009 to prepare the map.

TANANA CITY BOUNDARY

Magnetic North 19 1/2° E

To Old White Alice Site

MISSION HILL

OSCAR LAKE

NC CREEK

YUKON RIVER

MISSION ISLAND

Old Agricultural Project Site

Ralph M. Calhoun Memorial Airport Tract I
Plat No. 2009-2
QCD from U.S. 10/1/1965

USS 397
Pat. No. 762188

USS 10811 1 NA Cert. 50-95-0024
USS 10811 2 NA Cert. 50-95-0084
USS 10811 3 NA Cert. 50-95-0517
USS 10811 4 NA Cert. 50-96-0484
USS 10811 5 NA Cert. 50-96-0484
USS 10811 6 NA Cert. 50-95-0023
USS 10811 7 NA Cert. 50-96-0498
USS 10812 1 NA Cert. 50-96-0484
USS 10812 2 NA Cert. 50-97-0024
USS 10812 3 NA Cert. 50-95-0386
USS 10812 4 NA Cert. 50-96-0433
USS 10812 5 NA Cert. 50-95-0215
USS 10812 6 NA Cert. 50-95-0574
USS 10812 7 NA Cert. 50-95-0217
USS 10812 8 NA Cert. 50-95-0574
USS 10812 9 NA Cert. 50-95-0249
USS 10813 1 NA Cert. 50-95-0185
USS 10813 3 NA Cert. 50-95-0128
USS 10814 NA Cert. 50-98-0108
USS 10815 3
USS 5234 Pat. No. 50-79-0074
USS 5203 Pat. No. 50-83-0298
USS 5958 11
USS 5958 12
USS 1753 Pat. No. 765858
USS 1349 Cert. of Allot. F0445
USS 721 QCD to Tanana Tribal Council Bk. 10, Pgs. 153-154 12/30/1997
USS 721 U.S. School Reserve Pat No. 50-85-0356
USS 1107 Additional U.S. School Reserve Pat No. 50-85-0350
USS 11168 NA Cert. 50-95-0361
USS 11148 NA Cert. 50-95-0127
USS 4104 Pat. No. 50-85-0360
USS 2784
USS 10816 Gravel Pit

SEC. 4 Gov't Lot 15 I.C. No. 1038 Tozitna, Limited
SEC. 4 Gov't Lot 11 I.C. No. 1038 Tozitna, Limited and Gl's 9-10
SEC. 3 I.C. No. 1038 Tozitna, Limited
SEC. 9 I.C. No. 1038 Tozitna, Limited and Gl's 1,2,5,6,8,9,12,13
SEC. 10 I.C. No. 1038 Tozitna, Limited and Gl's 8&9
SEC. 17 Gov't Lot 1 I.C. No. 1701 Tozitna, Limited
SEC. 17 Gov't Lot 8 I.C. No. 1701 Tozitna, Limited
SEC. 16 Gov't Lot 6 I.C. No. 1701 Tozitna, Limited
SEC. 16 Gov't Lot 12 I.C. No. 1701 Tozitna, Limited
SEC. 16 Gov't Lot 11 I.C. No. 1701 Tozitna, Limited
SEC. 17 Gov't Lot 9 I.C. No. 1701 Tozitna, Limited

GL#1 GL#2 GL#5 GL#8 GL#9 GL#10 GL#12 GL#13 GL#14

F014299 50'
F70272 30'

APPROXIMATE LOCATION 60' Wide Existing Road Easement EIN 1a C1, C3, C5, D1, L1

APPROXIMATE LOCATION 60' Wide Existing Road Easement EIN 5f C3, C5, D9

Grant of Easement for Right-of-way to City of Tanana Bk. 8, Pgs. 85-89 10/27/1987

Grant of Easement for Right-of-way to City of Tanana Bk. 8, Pgs. 78-81 10/27/1987

Grant of Easement for Right-of-way to City of Tanana Bk. 8, Pgs. 82-85 10/27/1987

Grant of Easement for Right-of-way to City of Tanana Bk. 8, Pgs. 90-93 10/27/1987

Grant to City of Tanana Bk. 5, Pgs. 761-763 12/3/1980

Grant to City of Tanana Bk. 5, Pgs. 764-766 12/3/1980

QCD to Interior Regional Housing Authority Bk. 7, Pg. 241 2/3/1984

QCD to Interior Regional Housing Authority Bk. 6, Pgs. 145 9/8/1981

Warr. Deed to Tozitna, Limited Bk. 4, Pg. 266 5/10/1977

BOGHON-L-AA GHEEDLIL SUBDIVISION Plat No. 88-33

YUKON HEIGHTS SUBDIVISION Plat No. 87-4

TEEKONA SUBDIVISION Plat No. 77-1

Historical Site

Cemetery

Mission of Our Savior Church Cemetery

I.C. No. 1025 Tozitna, Limited

PLO 1977

BOGHON-L-AA GHEEDLIL SUBDIVISION OWNERSHIP TABLE

LOT	DEED TYPE	OWNERSHIP	BOOK	PAGE	DATE
1,6,7,11,13	Warranty Deed	Tozitna Limited	7	200	11/22/1983
2	QCD	Tozitna Limited	10	685	2/4/2000
8	Warranty Deed	Tozitna Limited	10	621	8/16/1985
9	Warranty Deed	Tozitna Limited	2002-000025-0		7/23/2002
10	Warranty Deed	Tozitna Limited	10	686	2/4/2000

TANANA AREA USE MAP SHEET 2 1"=600' (2009 PHOTOGRAPHY)

Appendix C: FEMA Review Tool

FEMA REGION 10 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 participating jurisdictions.

1. The Multi-Jurisdiction Summary Sheet is used to document how each jurisdiction met the requirements in the Plan.
2. The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
3. The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.

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

<table>
<tr><td>Jurisdiction:
Tanana, Alaska (Region 10)</td><td>Title of Plan:
City of Tanana/Native Village of Tanana, Alaska Multi-Jurisdictional Hazard Mitigation Plan</td><td>Date of Plan:
December 26, 2017</td></tr>
<tr><td colspan="2">Local Point of Contact:
Jeff Weltzin
Title:
City Manager
Agency: City of Tanana</td><td>Address:
P.O. Box 249
Tanana, AK 99777</td></tr>
<tr><td colspan="2">Phone Number: (907) 366-7159</td><td>E-Mail: jeffreyweltzin@gmail.com</td></tr>
</table>

State Reviewer:	**Title:**	**Date:**
Mike Johnson	Mitigation Planner	February 22, 2018

FEMA Reviewer:	**Title:**	**Date:**
Josh Vidmar Amanda Siok	Planner – CERC FEMA	March 13, 2018
Date Received in FEMA Region 10	February 23, 2018	
Plan Not Approved		
Plan Approvable Pending Adoption	May 11, 2018	
Plan Approved	March 12, 2019	

SECTION 1: MULTI-JURISDICTION SUMMARY SHEET (used only for multi-jurisdictional plans)

INSTRUCTIONS: The Multi-Jurisdiction Summary Spreadsheet is completed by listing each participating jurisdiction and which required Elements for each jurisdiction were 'Met' or 'Not Met,' and when the adoption resolutions were received. This Summary Sheet does not imply that a mini-plan be developed for each jurisdiction; it is used to ensure that each jurisdiction participating in the Plan has been documented and has met the requirements for those Elements (A through E).

MULTI-JURISDICTION SUMMARY SHEET (Add additional pages if necessary)											
#	Jurisdiction Name	Jurisdiction Type (city/borough/ district, etc.)	POC	Required Revisions / Comments	Requirements Met (Y/N)					
					A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Require-ments
1	Tanana	City	Jeff Weltzin (907) 366-7159		Y	Y	Y	Y	Y	N/A
2	Native Village of Tanana	Tribe	1st Chief Helium Edwardsen 907-366-7160X200						APA	
3										
4										
5										
6										
7										

SECTION 2: REGULATION CHECKLIST

INSTRUCTIONS: The Regulation Checklist is 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 is completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions are explained for each plan sub-element that is 'Not Met.' Sub-elements are referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable.

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))	PDF 13-20, 111-134	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))	Plan will be uploaded to DHS&EM webpage for review after approval; PDF 17-18	X	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	PDF 17-18, 111-134	X	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	PDF 15-17; PDF 108-109	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))	PDF 18-19, 169-173	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))	PDF 18-20, 165-173	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))	PDF 57-78	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))	PDF 58-59, 62-64, 67-70, 72-73, 74-76, 77-78	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))	PDF 53-54, 58, 61, 67, 72, 74, 77-78	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))	PDF 54	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))	PDF 28-30	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))	N/A--Tanana does not participate in the NFIP PDF 54	X	
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	PDF 53-56, 81	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))	PDF 81-84, 90-96	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))	PDF 98-99	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))	PDF 16, 18, 97	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))	PDF 54-56	X	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	PDF 81-84	X	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	PDF 98-99	X	
ELEMENT D: REQUIRED REVISIONS			
ELEMENT E. PLAN ADOPTION			
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Joint Adoption Letter to be included on Page xi	X	
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	Joint Adoption Letter to be included on Page xi		
ELEMENT E: REQUIRED REVISIONS			
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)			
F1.			
F2.			
ELEMENT F: REQUIRED REVISIONS			

SECTION 3: 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

- First meeting included a great cross section of the population (Residents, School, VPSO, and private enterprise)
- Draft/comment event was held during Christmas party. Turnout was extraordinary.
- Second meeting held in coordination with City/Tribal Christmas party.
- Meeting notes are included in the appendix

Opportunities for Improvement

- Consider other informal opportunities such as the Christmas Party to broaden public outreach. Using existing meetings and events is a good way to boost attendance and knowledge of the planning process.
- Continued public involvement is currently a bit vague. Considering including more information on how the public will be included in the overall process.

Element B: Hazard Identification and Risk Assessment

Plan Strengths

- The plan includes hazards that are unique to the area and are applicable to the City.
- There is a lot of great demographic and housing information that is used to discuss the overall vulnerability to each hazard.

Opportunities for Improvement

- Need to address the reason for the incomplete Mitigation Goals. What can be done different?
- The hazard profiles are very short and do not fully describe each hazard in full. For example, more information could be provided regarding each hazard's overall effect on the City.
- Consider using maps to show where hazard events can and have occurred.

Element C: Mitigation Strategy

Plan Strengths

- Added several new goals in the updated edition.
- Addressed several things that may eventually end up as a mitigation project in the future.

Opportunities for Improvement

- A possible location for a plan integration discussion could be on page 4 or 5 alongside the local documentation that was used in drafting the plan. Consider adding in a short description on if these were updated to reflect information from the previous HMP.

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

Plan Strengths

- City/Tribe will host a table at Spring Carnival to conduct annual surveys.
- There are detailed forms in the appendix that show

Opportunities for Improvement

- More information can be provided on how development has affected the overall vulnerability of the City. There is a lot of great demographic and land use data that does not fully detail how conditions have changed. Further, the area use maps in the back could be useful in providing a narrative for this.

A. B. Resources for Implementing Your Approved Plan

The **Region 10 Integrating Natural Hazard Mitigation into Comprehensive Planning** is a resource specific to Region 10 states and provides examples of how communities are integrating natural hazard mitigation strategies into comprehensive planning. You can find it in the FEMA Library at http://www.fema.gov/media-library/assets/documents/89725.

The **Integrating Hazard Mitigation Into Local Planning: Case Studies and Tools for Community Officials** resource provides practical 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 in practice. You can find it in the FEMA Library at http://www.fema.gov/library/viewRecord.do?id=7130.

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. You can find it in the FEMA Library at http://www.fema.gov/library/viewRecord.do?id=6938.

The **Local Mitigation Planning Handbook** provides guidance to local governments on developing or updating hazard mitigation plans to meet and go above the requirements. You can find it in the FEMA Library at http://www.fema.gov/library/viewRecord.do?id=7209.

The **Integration Hazard Mitigation and Climate Adaptation Planning: Case Studies and Lessons Learned** resource is a 2014 ICLEI publication for San Diego with a clear methodology that could assist in next steps for integration impacts of climate change throughout mitigation actions. http://icleiusa.org/wp-content/uploads/2015/08/Integrating-Hazard-Mitigation-and-Climate-Adaptation-Planning.pdf

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 **Tribal Multi-Hazard Mitigation Planning Guidance:** This resource is specific to tribal governments developing or updating tribal mitigation plans. It covers all aspects of tribal planning requirements and the steps to developing tribal mitigation plans. You can find the document in the FEMA Library at http://www.fema.gov/media-library/assets/documents/18355

Volcanic Eruption Mitigation Measures: For information on Mitigation Actions for Volcanic Eruptions that would satisfy the C4 requirement, please visit: http://earthzine.org/2011/03/21/volcanic-crisis-management-and-mitigation-strategies-a-multi-risk-framework-case-study/ and http://www.gvess.org/publ.html.

The FEMA Region 10 **Risk Mapping, Analysis, and Planning program (Risk MAP)** 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 and ask to be included.

The mitigation strategy may include eligible projects to be funded through FEMA's hazard mitigation grant programs (Pre-Disaster Mitigation, Hazard Mitigation Grant Program, and Flood Mitigation Assistance). Contact your State Hazard Mitigation Officer, Brent Nichols at Brent.Nichols@alaska.gov, for more information.

Instructions for Using the Plan Review Crosswalk for Review of Tribal Multi-Hazard Mitigation Plans

Attached is a Plan Review Crosswalk based on the ***Tribal Multi-Hazard Mitigation Planning Guidance***, published by FEMA, dated March 2010. This Plan Review Crosswalk is consistent with the Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended by the Disaster Mitigation Act of 2000 (P.L. 106-390); the National Flood Insurance Act of 1968, as amended by the National Flood Insurance Reform Act of 2004 (P.L. 108-264); and 44 Code of Federal Regulations (CFR) Part 201 – *Mitigation Planning*, inclusive of all amendments through November 30, 2009.

SCORING SYSTEM

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

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

Each requirement includes separate elements. All elements of a requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a summary score of "Satisfactory." A "Needs Improvement" score on elements shaded in gray (recommended but not required) will not preclude the plan from passing.

When reviewing single jurisdiction plans, reviewers may want to put an N/A in the boxes for multi-jurisdictional plan requirements. When reviewing multi-jurisdictional plans, reviewers may want to put an N/A in the prerequisite box for single jurisdiction plans. Indian Tribal governments or States that have additional requirements can add them in the appropriate sections of the *Multi-Hazard Mitigation Planning Guidance* or create a new section and modify this Plan Review Crosswalk to record the score for those requirements.

Optional matrices for assisting in the review of sections on profiling hazards, assessing vulnerability, and identifying and analyzing mitigation actions are found at the end of the Plan Review Crosswalk.

The example below illustrates how to fill in the Plan Review Crosswalk.

Example

Assessing Vulnerability: Overview

Requirement 201.7(c)(2)(ii): *[The risk assessment **shall** include a] description of the Indian Tribal government'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 tribe.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan include an **overall summary** description of the Indian tribe's **vulnerability** to each hazard?	Section II, pp. 4-10	The plan describes the types of assets that are located within geographically defined hazard areas as well as those that would be affected by winter storms.		✓
B. Does the plan address the **impact** of each hazard on the Indian tribe?	Section II, pp. 10-20	The plan does not address the impact of two of the five hazards addressed in the plan. **Required Revisions:** • Include a description of the impact of floods and earthquakes on the assets. **Recommended Revisions:** • This information can be presented in terms of dollar value or percentages of damage.	✓	
		SUMMARY SCORE	✓	

Tribal Mitigation Plan Review and Approval Status

Tribe: Native Village of Tanana	**Title of Plan:** City of Tanana/Native Village of Tanana MJHMP	**Date of Plan:** December 26, 2017
Tribal Point of Contact: Helium "Una" Edwardsen	**Address:** PO BOX 130 Tanana, AK 99777	
Title: 1st Chief		
Agency: Native Village of Tanana		
Phone Number: (907) 366-7160, x200	**E-Mail:** hedwardsen@tananatribe.org	

State Reviewer (if applicable):	**Title:** Brent Nichols, CFM	**Date:**

FEMA Reviewer: Kate Skaggs Amanda Siok; Amanda.Siok@fema.dhs.gov	**Title:** Mitigation Champion FEMA Mitigation Planner	**Date:** March 19, 2018
Date Received in FEMA Region 10	February 23, 2018; April 4, 2018	
Plan Not Approved		
Plan Approved	**APA – May 11, 2018**	
Date Approved		

Additional Indian Tribal Governments (if appropriate): N/A	**DFIRM**		**NFIP Status***			
	In Plan	**NOT In Plan**	**Y**	**N**	**N/A**	**CRS Class**
1.						
2.						
3.						
4.						
5. [ATTACH PAGE(S) WITH ADDITIONAL INDIAN TRIBAL GOVERNMENTS]						

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

TRIBAL MULTI-HAZARD MITIGATION PLAN REVIEW SUMMARY

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

SCORING SYSTEM

Please check one of the following for each requirement.

N – Needs Improvement: The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.
S – Satisfactory: The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

Planning Process	N	S
1. Documentation of the Planning Process: 201.7(b) and 201.7(c)(1)(i) and (ii)		**X**
2. Program Integration: 201.7(c)(1)(iii) and (iv)		X

Risk Assessment	N	S
3. Identifying Hazards: 201.7(c)(2)(i)		X
4. Profiling Hazards: 201.7(c)(2)(i)		X
5. Assessing Vulnerability: Overview: 201.7(c)(2)(ii)		X
6. Assessing Vulnerability: Identifying Structures: 201.7(c)(2)(ii)(A)		X
7. Assessing Vulnerability: Estimating Potential Losses: 201.7(c)(2)(ii)(B)		X
8. Assessing Vulnerability: Analyzing Development Trends: 201.7(c)(2)(ii)(C)		X
9. Assessing Vulnerability: Assessing Cultural and Sacred sites: 201.7(c)(2)(ii)(D)		X

Mitigation Strategy	N	S
10. Tribal Multi-Hazard Mitigation Goals: 201.7(c)(3)(i)		X
11. Identification and Analysis of Tribal Mitigation Actions: 201.7(c)(3)(ii)		X
12. Implementation of Tribal Mitigation Actions: 201.7(c)(3)(iii)		X
13. Tribal Capability Assessment: 201.7(c)(3)(iv)		X
14. Tribal Funding Sources: 201.7(c)(3)(v)		X

Plan Maintenance Process	N	S
15. Monitoring, Evaluating, and Updating the Plan: 201.7(c)(4)(i)		X
16. Monitoring Progress of Mitigation Activities: 201.7(c)(4)(ii) and 201.7(4)(v)		X
17. Incorporation into Existing Planning Mechanisms: 201.7(c)(4)(iii)		X
18. Continued Member and Stakeholder Involvement: 201.7(c)(4)(iv)		X

Prerequisites	NOT MET	MET
19. Adoption by the Tribal Governing Body : 201.7(c)(5) and (c)(6) ***[single Indian Tribal government only]***	**X**	
20. Multi-Jurisdictional Plan Adoption: 201.7(a)(4), (c)(5) and(c)(6) ***[multi-jurisdictional only]***		N/A
21. Multi-Jurisdictional Planning Participation: 201.7(a)(4) ***[multi-jurisdictional only]***		N/A

Severe Repetitive Loss Strategy (Optional)	N	S
22. Repetitive Loss Strategy: 201.7(c)(3)(vi)		N/A

TRIBAL MITIGATION PLAN APPROVAL STATUS

PLAN NOT APPROVED	
See Reviewer's Comments	
PLAN APPROVED	**Pending Adoption**

PLANNING PROCESS: *201.7(b): An effective planning process is essential in developing and maintaining a good plan. The mitigation planning process should include coordination with other tribal agencies, appropriate Federal agencies, adjacent jurisdictions, interested groups, and be integrated to the extent possible with other ongoing tribal planning efforts as well as other FEMA mitigation programs and initiatives.*

1. Documentation of the Planning Process

Requirement 201.7(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 defined and involved. This **shall** include:*

(i) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval, including a description of how the Indian Tribal government defined "public;" and

(ii) As appropriate, an opportunity for neighboring communities, tribal 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.

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE** N	**SCORE** S
A. Does the plan provide a narrative **description of the process** followed to prepare the new or updated plan?	PDF 14-20, 111-134	This was a joint plan between the City of Tanana and the Native Village of Tanana. All NVT members reside within the City and are included as City residents. Plan Committee sign-in sheet on PDF page 113.		X
B. Does the new or updated plan indicate **who was involved** in the current planning process?	PDF 14-20, 111-134	Table 1. shows the Hazard Mitigation Planning Team on PDF page 15.		X
C. Does the new or updated plan indicate **how the "public" was defined and involved**? How was the "public" defined? How was the "public" involved? Were they provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?	PDF 17-18, 111-134			X
D. Does the new or updated plan discuss the opportunity for other Indian Tribal governments, tribal and regional agencies, businesses, academia, nonprofits, neighboring communities, and other affected stakeholders and interested parties to be involved in the planning process?	PDF 17-18; 125-127; Tribal Administrator had the Draft HMP Update electronically before the December 22 meeting and was instructed to email			X

	at her discretion			
E. Does the updated plan document how the planning team reviewed and analyzed each section of the plan? ***[Updates only.]***	N/A	This plan is an update for the City but an initial plan for the NVT.		N/A
F. Does the updated plan indicate for each section of the plan whether or not it was revised as part of the update process? ***[Updates only.]***	N/A	Not a plan update.		N/A
		SUMMARY SCORE		X

2. Program Integration

Requirement 201.7(c)(1)(iii) and (iv): *[The plan **shall**:]*
[include] (iii) Review and incorporation, if appropriate, of existing plans, studies, and reports; and
(iv) Be integrated to the extent possible with other ongoing tribal planning efforts as well as other FEMA programs and initiatives.

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	SCORE N	SCORE S
A. Does the new or updated plan describe the review and incorporation, if appropriate, of existing plans, studies, and reports in the new or updated plan?	PDF 16, 18	Recommended Revisions: PDF 18 explains that the City Manager and Tribal Executive Director were responsible for providing a list of City and NVT documents. Consider including those documents in this section.		X
B. Does the new or updated plan describe how the Indian tribal mitigation plan is **integrated with other ongoing Indian tribal planning efforts**?	PDF 28-30	Recommended Revision: While tables indicate which planning mechanisms are available, consider additional information about how this plan data will be integrated into these mechanisms.		X
C. Does the new or updated plan describe how the Indian tribal mitigation planning process is **integrated with FEMA mitigation programs and initiatives**?	PDF 32-35			X
		SUMMARY SCORE		X

RISK ASSESSMENT: *201.7(c)(2): [The plan **shall** include a] risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Tribal risk assessments must provide sufficient information to enable the Indian Tribal government to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.*

3. Identifying Hazards

Requirement 201.7(c)(2)(i): *[The risk assessment **shall** include a] description of the type … of all natural hazards that can affect the tribal planning area.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE** N	**SCORE** S
A. Does the new or updated plan describe the **tribal planning area**?	PDF 14			X
B. Does the new or updated plan include a description of the **types of all natural hazards** that affect the tribal planning area?	PDF 57-78			X
		SUMMARY SCORE		X

4. Profiling Hazards

Requirement 201.7(c)(2)(i): *[The risk assessment **shall** include a] description of the … location and extent of all natural hazards that can affect the tribal planning area. The plan **shall** include information on previous occurrences of hazard events and on the probability of future hazard events.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the risk assessment identify the **location** (i.e., geographic area affected) of each natural hazard addressed in the new or updated plan?	PDF 57-78	Recommended Revision Provide more information such as a narrative description or a map illustration, showing the geographic location of the area impacts by each hazard.		X
B. Does the risk assessment identify the **extent** (i.e., magnitude or severity) of each hazard addressed in the new or updated plan?	PDF 57-78	Recommended Revision Include more information on extent for each hazard, this could include the Richter scale for earthquakes, 100 year flood, fuel models and condition classes or slopes for wildfire hazards. Landfire data at https://www.landfire.gov/index.php provides this most of this information for wildfires.		X
C. Does the new or updated plan provide information on **previous occurrences** of each hazard addressed in the plan?	PDF 58-59, 62-64, 67-70, 72-73, 74-76, 77-78			X
D. Does the new or updated plan include the **probability of future events** (i.e., chance of occurrence) for each hazard addressed in the plan?	PDF 58-59, 62-64, 67-70, 72-73, 74-76, 77-78	Recommended Revision: Consider integrating climate change data in this section to better predict changes in future events.		X
E. Does the updated plan address data deficiencies, if any, noted in the previously approved plan?	N/A	Not a plan update.		N/A
		SUMMARY SCORE		X

5. Assessing Vulnerability: Overview

Requirement 201.7(c)(2)(ii): *[The risk assessment **shall** include a] description of the Indian Tribal government'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 tribe.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan include an **overall summary** description of the Indian tribe's **vulnerability** to each hazard?	PDF 53-54	Information in Extent and Impacts describe overall vulnerability to each hazard.		X
B. Does the new or updated plan address the **impact** of each hazard on the Indian tribe?	PDF 53-54, 58, 61, 67, 72, 74, 77-78	Specific lists of critical facilities that would be impacted.		X
		SUMMARY SCORE		X

6. Assessing Vulnerability: Identifying Structures

Requirement 201.7(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.*

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan describe vulnerability in terms of the **types and numbers** of **existing** buildings, infrastructure, and critical facilities located in the identified hazard areas?	PDF 44-51			X
B. Does the new or updated plan describe vulnerability in terms of the **types and numbers** of **future** buildings, infrastructure, and critical facilities located in the identified hazard areas?	PDF 53-56			X
		SUMMARY SCORE		X

7. Assessing Vulnerability: Estimating Potential Losses

Requirement 201.7(c)(2)(ii)(B): *[The plan **should** describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate.*

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan estimate **potential dollar losses** to vulnerable structures?	PDF 49-51	Plan provides some building loss estimates.		X
B. Does the new or updated plan describe the **methodology** used to prepare the estimate?	PDF 53			X
C. Does the updated plan reflect the effects of **changes in development** on loss estimates?	N/A	Not a plan update.		N/A
		SUMMARY SCORE		X

8. Assessing Vulnerability: Analyzing Development Trends

Requirement 201.7(c)(2)(ii)(C): *[The plan **should** describe vulnerability in terms of a] general description of land uses and development trends within the tribal planning area so that mitigation options can be considered in future land use decisions.*

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan describe land uses and development trends within the tribal planning area?	PDF 54-56	This plan details some information on pending development since the City's last NHMP.		X
B. Does the updated plan reflect changes in development for tribal lands in hazard prone areas within the tribal planning area?	N/A	Not a plan update.		N/A
		SUMMARY SCORE		X

9. Assessing Vulnerability: Assessing Cultural and Sacred Sites

Requirement 201.7(c)(2)(ii)(D): *[The plan **should** describe vulnerability in terms of] cultural and sacred sites that are significant, even if they cannot be valued in monetary terms.*

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan describe significant cultural and sacred sites that are located in hazard areas?	PDF 28, 44-45			X
		SUMMARY SCORE		X

MITIGATION STRATEGY: *201.7(c)(3): [The plan **shall** include a] mitigation strategy that provides the Indian Tribal government'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.*

10. Tribal Multi-Hazard Mitigation Goals

Requirement 201.7(c)(3)(i): *[The mitigation strategy **shall** include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A Does the new or updated plan include a description of mitigation **goals** to reduce or avoid long-term vulnerabilities to the identified hazards?	PDF 81			X
B. Does the updated plan demonstrate that the goals were evaluated and either remain valid or have been revised?	N/A	Not a plan update.		N/A
		SUMMARY SCORE		X

11. Identification and Analysis of Tribal Mitigation Actions

Requirement 201.7(c)(3)(ii): *[The mitigation strategy **shall** include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan identify and analyze a **comprehensive range** of specific mitigation actions and projects for each hazard?	PDF 81-84; 90-96	Recommended Revision: Consider updating the timeframe for each action. FEMA recommends changing that to specific years such as 2018 or 2021 to give a specific target.		X
B Do the identified actions and projects address reducing the effects of hazards on **new** buildings and infrastructure?	PDF 81-96	Recommended Revision: The plan mentions a new subdivision development. Consider updating the mitigation actions to include hazard risk reduction for this community. Or develop outreach strategies for the developer.		X
C. Do the identified actions and projects address reducing the effects of hazards on **existing** buildings and infrastructure?	PDF 84			X
		SUMMARY SCORE		X

12. Implementation of Tribal Mitigation Actions

Requirement: 201.7(c)(3)(iii): *[The mitigation strategy **shall** include an] action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the Indian Tribal government.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	SCORE N	SCORE S
A. Does the mitigation strategy in the new or updated plan include how the actions are **prioritized**? (For example, is there a discussion of the process and criteria used?)	PDF 98-99			X
B. Does the mitigation strategy in the new or updated plan address how the actions will be **implemented and administered,** including the responsible agency, existing or potential resources, and the timeframe to complete each action?	PDF 90-99			X
C. Does the **updated** plan identify the completed, deleted, or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (i.e., deferred), does the updated plan describe why no changes occurred?	N/A	Not a plan update.		N/A
		SUMMARY SCORE		X

13. Tribal Capability Assessment

Requirement 201.7(c)(3)(iv): *[The mitigation strategy **shall** include a] discussion of the Indian Tribal government's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including: An evaluation of tribal laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas; and a discussion of tribal funding capabilities for hazard mitigation projects.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	SCORE	
			N	**S**
A. Does the new or updated plan include an evaluation of the Indian Tribal government's **pre-disaster hazard management** laws, regulations, policies, programs, and capabilities?	PDF 14			X
B. Does the new or updated plan include an evaluation of the Indian Tribal government's **post-disaster hazard management** laws, regulations, policies, programs, and capabilities?	PDF 14			X
C. Does the new or updated plan include an evaluation of the Indian Tribal government's laws, regulations, policies, programs, and capabilities **related to development** in hazard prone areas?	PDF 29-30			X
D. Does the new or updated plan include a discussion of the Indian Tribal government's **funding capabilities** for hazard mitigation projects?	PDF 29	Depend on available government and private grants.		X
E. Does the updated plan address any hazard management laws, policies, programs, capabilities, or funding capabilities of the Indian Tribal government's that have changed since approval of the previous plan?	N/A	Not a plan update.		N/A
		SUMMARY SCORE		X

14. Tribal Funding Sources

Requirement 201.7(c)(3)(v): *[The mitigation strategy **shall** include an] identification of current and potential sources of Federal, tribal, or private funding to implement mitigation activities.*

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan identify **current** sources of Federal, tribal, or private funding to implement mitigation activities?	PDF 32-35, 98-99			X
B. Does the new or updated plan identify **potential** sources of Federal, tribal, or private funding to implement mitigation activities?	PDF 32-35, 98-99			X
C. Does the updated plan identify the sources of mitigation funding used to implement activities in the mitigation strategy since approval of the previous plan?	N/A	Not a plan update.		N/A
		SUMMARY SCORE		X

PLAN MAINTENANCE PROCESS

15. Monitoring, Evaluating, and Updating the Plan

Requirement 201.7(c)(4)(i): *[The plan maintenance process **shall** include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan.*

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan describe the method and schedule for **monitoring** the plan, including how, when, and by whom (e.g., the responsible agency)?	PDF 19-20, 165-168	The City Manager will coordinate with the Tribal Executive Director to monitor the plan.		X
B. Does the new or updated plan describe the method and schedule for **evaluating** the plan, including how, when, and by whom (e.g., the responsible agency)?	PDF 19-20, 165-168			X
C. Does the new or updated plan describe the method and schedule for **updating** the plan, including how, when, and by whom (e.g., the responsible agency), within the 5-year cycle?	PDF 19-20, 165-168			X
D. Does the updated plan include an analysis of whether the previously approved plan's method and schedule worked, and what elements or processes, if any, were changed for the next 5 years?	N/A	Not a plan update.		N/A
		SUMMARY SCORE		X

16. Monitoring Progress of Mitigation Activities

Requirement 201.7(c)(4)(ii): *[The plan maintenance process **shall** include a] system for monitoring implementation of mitigation measures and project closeouts.*

Requirement 201.7(c)(4)(v): *[The plan maintenance process **shall** include a] system for reviewing progress on achieving goals as well as activities and projects identified in the mitigation strategy.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan describe how mitigation measures and project closeouts will be **monitored**?	PDF 19-20			X
B. Does the new or updated plan identify a **system for reviewing progress** on achieving goals and implementing activities and projects in the Mitigation Strategy?	PDF 19-20	Recommended Revision: Develop a clearer description of how the Mitigation Action Progress Report will be used to track progress on mitigation actions.		X
C. Does the updated plan describe any modifications, if any, to the system identified in the previously approved plan to track the initiation, status, and completion of mitigation activities?	N/A	Not a plan update.		N/A
D. Does the updated plan discuss whether mitigation actions were implemented as planned?	N/A	Not a plan update.		N/A
		SUMMARY SCORE	X	

17. Incorporation into Existing Planning Mechanisms

Requirement 201.7(c)(4)(iii): *[The plan maintenance process **shall** include a] process by which the Indian Tribal government incorporates the requirements of the mitigation plan into other planning mechanisms such as reservation master plans or capital improvement plans, when appropriate.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan identify **other tribal planning mechanisms** available for incorporating the requirements of the mitigation plan?	PDF 29-30			X
B. Does the new or updated plan include a **process by which the Indian Tribal government will incorporate the mitigation strategy** and other information contained in the plan (e.g., risk assessment) into other planning mechanisms, when appropriate?	PDF 97			X
		SUMMARY SCORE		X

18. Continued Member and Stakeholder Involvement

Requirement 201.7(c)(4)(iv): *[The plan maintenance process **shall** include a] discussion on how the Indian Tribal government will continue public participation in the plan maintenance process.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan explain how **continued public participation** will be obtained? (For example, will there be public notices, an on-going mitigation plan committee, or annual review meetings with stakeholders?)	Continued Public Involvement on PDF 18-19	The plan highlights the great opportunity of the Spring Carnival as a venue for continued public participation and outreach.		X
		SUMMARY SCORE		X

PREREQUISITES

19. Adoption by the Tribal Governing Body (*Single Indian Tribal government*)

Requirement 201.7(c)(5)**:** *The plan **must** be formally adopted by the governing body of the Indian Tribal government prior to submitting to FEMA for final review and approval.*

Requirement 201.7(c)(6): *[The plan **must** include] assurances that the Indian Tribal government will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 13.11(c) of this chapter. The Indian Tribal government will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in 13.11(d) of this chapter.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Has the Indian tribal governing body formally adopted the new or updated plan?	They have committed to do so after FEMA approval of the plan.	Completion upon APA.		X
B. Is supporting documentation, such as a resolution, included with the new or updated plan?	PDF 10			X
C. Does the new or updated plan provide assurances that the Indian Tribal government will continue to comply with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in 44 CFR 13.11(d)?	PDF 14			X

SUMMARY SCORE		X

20. Multi-Jurisdictional Plan Adoption (*Multiple Indian Tribal governments*)

***Requirement 201.7(a)(4)*:** *Multi-jurisdictional plans (*e.g., *county-wide or watershed plans) may be accepted, as appropriate, as long as each Indian Tribal government…has officially adopted the plan.*

***Requirement 201.7(c)(5)*:** *The plan **must** be formally adopted by the governing body of the Indian Tribal government prior to submittal to FEMA for final review and approval.*

***Requirement 201.7(c)(6):** [The plan **must** include] assurances that the Indian Tribal government will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 13.11(c) of this chapter. The Indian Tribal government will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in 13.11(d) of this chapter.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	SCORE NOT MET	SCORE MET
A. Does the new or updated plan indicate the specific Indian Tribal government(s) represented in the plan?	N/A			
B. For each Indian Tribal government(s), has the governing body adopted the new or updated plan?	N/A			
C. Is supporting documentation, such as a resolution, included for each participating Indian Tribal government(s)?	N/A			
D. Does the new or updated plan provide assurances that the Indian Tribal government will continue to comply with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in 44 CFR 13.11(d)?	N/A			
		SUMMARY SCORE		

21. Multi-Jurisdictional Planning Participation (*Multiple Indian Tribal governments*)

***Requirement 201.7(a)(4)*:** *Multi-jurisdictional plans (e.g., county-wide or watershed plans) may be accepted, as appropriate, as long as each Indian Tribal government has participated in the process... Indian Tribal governments must address all the elements identified in [44 CFR 201.7] to ensure eligibility as a grantee or as a subgrantee.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Does the new or updated plan describe **how** each Indian Tribal government participated in the plan's development?	N/A			
B. Does the updated plan identify all participating Indian Tribal governments, including new and continuing Indian Tribal government(s) and any Indian Tribal government(s) that no longer participate in the plan?	N/A			
C. Does each participating Indian Tribal government participating in the new or updated mitigation plan meet all of the elements identified in the *Tribal Multi-Hazard Mitigation Plan Review Crosswalk* for their tribal planning area? Has a separate crosswalk for participating Indian Tribal government(s) been completed, and are all elements "Met" or "S"?	N/A			
		SUMMARY SCORE		

REPETITIVE LOSS STRATEGY (OPTIONAL)

22. Repetitive Loss Strategy

Requirement 201.7(c)(3)(vi): *An Indian Tribal government applying to FEMA as a grantee may request the reduced cost share authorized under 79.4(c)(2) of this chapter of the FMA and SRL programs if they have an approved Tribal Mitigation Plan meeting the requirements of this section that also identifies actions the Indian Tribal government has taken to reduce the number of repetitive loss properties (which must include severe repetitive loss properties), and specifies how the Indian Tribal government intends to reduce the number of such repetitive loss properties.* ***[Note: While submittal of a Repetitive Loss Strategy is optional, if the Indian Tribal government wants to request the reduced cost share authorized under 44 CFR 79.4(c)(2) for the FMA and SRL programs as a grantee, then all of the following requirements must be met.]***

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan address repetitive loss properties in its risk assessment (see 201.7(c)(2))?	N/A	***[Note: Only required for SRL 90/10 under FMA & SRL]***		
B. Does the new or updated plan describe the Indian Tribal government's mitigation goals that support the selection of mitigation activities for repetitive loss properties (see 201.7(c)(3)(i))?	N/A	***[Note: Only required for SRL 90/10 under FMA & SRL]***		
C. Does the new or updated plan identify mitigation actions for repetitive loss properties (see 201.7(c)(3)(iii))?	N/A	***[Note: Only required for SRL 90/10 under FMA & SRL]***		
D. Does the new or updated plan describe specific actions that have been implemented to mitigate repetitive loss properties, including actions taken to reduce the number of severe repetitive loss properties?	N/A	***[Note: Only required for SRL 90/10 under FMA & SRL]***		
E. Does the new or updated plan consider repetitive loss properties in its evaluation of the Indian Tribal government's hazard management laws, regulations, policies, programs, and capabilities and its general description of mitigation capabilities (see 201.7(c)(3)(iv))?	N/A	***[Note: Only required for SRL 90/10 under FMA & SRL]***		
F. Does the new or updated plan identify current and potential sources of Federal, tribal, or private funding to implement mitigation activities for repetitive loss properties (see 201.7(c)(3)(v))?	N/A	***[Note: Only required for SRL 90/10 under FMA & SRL]***		
		SUMMARY SCORE		

MATRIX A: PROFILING HAZARDS

This matrix can assist FEMA (and the State, if applicable) as well as the Indian Tribal government in scoring each hazard. Indian Tribal governments may find the matrix useful to ensure that their plan addresses each natural hazard that can affect the tribal planning area. **Completing the matrix is not required**.

Note: First, check which hazards are identified in requirement 201.7(c)(2)(i). Then, place a checkmark in either the N or the S box for each applicable hazard. An "N" for any element of any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk.

Hazard Type	Hazards Identified Per Requirement 201.7(c)(2)(i)		A. Location		B. Extent		C. Previous Occurrences		D. Probability of Future Events	
	Not a Hazard	Yes	N	S	N	S	N	S	N	S
Avalanche		√								
Coastal Erosion		√								
Coastal Storm		√								
Dam Failure	√									
Drought		√								
Earthquake		√								
Expansive Soils	√									
Extreme Heat	√									
Flood		√								
Hailstorm	√									
Hurricane	√									
Land Subsidence		√								
Landslide		√								
Severe Winter Storm		√								
Tornado	√									
Tsunami		√								
Volcano	√									
Wildfire		√								
Windstorm		√								
Other:										
Other:										
Other:										

Legend: 201.7(c)(2)(i) Profiling Hazards
A. Does the risk assessment identify the location (i.e., geographic area affected) of each hazard addressed in the new or updated plan?
B. Does the risk assessment identify the extent (i.e., magnitude or severity) of each hazard addressed in the new or updated plan?
C. Does the plan provide information on previous occurrences of each natural hazard addressed in the new or updated plan?
D. Does the plan include the probability of future events (i.e., chance of occurrence) for each hazard addressed in the new or updated plan?

MATRIX B: ASSESSING VULNERABILITY

This matrix can assist FEMA (and the State, if applicable) as well as the Indian Tribal government in scoring each hazard. Indian Tribal governments may find the matrix useful to ensure that their plan addresses each natural hazard that can affect the tribal planning area. **Completing the matrix is not required**.

*Note: First, check which hazards are identified in requirement 201.7(c)(2)(i). Then, place a checkmark in either the N or the S box for each **applicable** hazard. An "N" for any element of any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk. Note: Receiving an N in the shaded columns will not preclude the plan from passing.*

Hazard Type	Hazards Identified Per Requirement 201.7(c)(2)(i)		201.7(c)(2)(ii) Overview	A. Overall Description of Vulnerability		B. Hazard Impact		201.7(c)(2)(ii)(A) and (D) Identifying Structures and Sacred Sites (types and estimated numbers)	A. Existing Structures		B. Future Structures		201.7(c)(2)(ii)(B) Estimating Potential Losses	A. Loss Estimate		B. Methodology	
	Not a Hazard	Yes		N	S	N	S		N	S	N	S		N	S	N	S
Avalanche		√															
Coastal Erosion		√															
Coastal Storm		√															
Dam Failure	√																
Drought		√															
Earthquake		√															
Expansive Soils		√															
Extreme Heat	√																
Flood		√															
Hailstorm	√																
Hurricane	√																
Land Subsidence		√															
Landslide		√															
Severe Winter Storm		√															
Tornado	√																
Tsunami		√															
Volcano	√																
Wildfire		√															
Windstorm		√															
Other:																	
Other:																	
Other:																	

Legend:

201.7(c)(2)(ii) Assessing Vulnerability: Overview

A. Does the new or updated plan include an overall summary description of the vulnerability of the tribal planning area to each hazard?

B. Does the new or updated plan address the impact of each hazard on the tribal planning area?

201.7(c)(2)(ii)(A) Assessing Vulnerability: Identifying Structures

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

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

201.7(c)(2)(ii)(B) Assessing Vulnerability: Estimating Potential Losses

A. Does the new or updated plan estimate potential dollar losses to vulnerable structures?

B. Does the new or updated plan describe the methodology used to prepare the estimate?

MATRIX C: IDENTIFICATION AND ANALYSIS OF MITIGATION ACTIONS

This matrix can assist FEMA (and the State, if applicable) as well as the Indian Tribal government, in scoring each hazard. Indian Tribal governments may find the matrix useful to ensure consideration of a range of actions for each hazard. **Completing the matrix is not required.**

*Note: First, check which hazards are identified in requirement 201.7(c)(2)(i). Then, place a checkmark in either the N or the S box for each **applicable** hazard. An "N" for any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk.*

Hazard Type	Hazards Identified Per Requirement 201.7(c)(2)(i)		A. Comprehensive Range of Actions and Projects	
	Not a Hazard	Yes	N	S
Avalanche		√		
Coastal Erosion		√		
Coastal Storm		√		
Dam Failure	√			
Drought		√		
Earthquake		√		
Expansive Soils		√		
Extreme Heat	√			
Flood		√		
Hailstorm	√			
Hurricane	√			
Land Subsidence		√		
Landslide		√		
Severe Winter Storm		√		
Tornado	√			
Tsunami		√		
Volcano	√			
Wildfire		√		
Windstorm		√		
Other:				
Other:				
Other:				

Legend:
201.7(c)(3)(ii) Identification and Analysis of Mitigation Actions
A. Does the new or updated plan identify and analyze a comprehensive range of specific mitigation actions and projects for each hazard?

Appendix D: Benefit-Cost Analysis Fact Sheet

Benefit-Cost Analysis Fact Sheet

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

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

All Benefit-Costs must be:

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

General Data Requirements:

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

Damage and Benefit Data

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

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

Building Data

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

Use Correct Occupancy Data

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

Questions to Be Answered

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

Common Shortcomings

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

Appendix E: Plan Maintenance Documents

Annual Review Questionnaire

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

Mitigation Action Progress Report

Progress Report Period: _____ (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:

Community Local Hazard Mitigation Plan Survey

This survey is an opportunity for you to share your opinions and participate in the mitigation planning process. The information that you provide will help us better understand your concerns for hazards and risks, which could lead to mitigation activities that will help reduce those risks and the impacts of future hazard events.

The hazard mitigation process is not complete without your feedback. All individual responses are strictly confidential and will be used for mitigation planning purposes only.

Please help us by taking a few minutes to complete this survey and return it to:

City Manager or Tribal Executive Director

Vulnerability Assessment

The following questions focus on how vulnerable the community or its facilities are to damage from a particular hazard type using the following vulnerability scale:

0= Don't Know 1 =Minimally Vulnerable 2=Moderately Vulnerable 3=Severely Vulnerable

1. How vulnerable to damage are the *structures* in the community from:

a. Flooding?	0 1 2 3
b. Wildfire?	0 1 2 3
C. Earthquakes?	0 1 2 3
d. Volcanoes?	0 1 2 3
e. Snow Avalanche?	0 1 2 3
f. Tsunami/Seiches?	0 1 2 3
g. Severe weather storms?	0 1 2 3
h. Ground failure (landslide, permafrost)?	0 1 2 3
i. Coastal erosion?	0 1 2 3
j. Climate change?	0 1 2 3
k. Other hazards?	0 1 2 3
Please Specify:	

2. How vulnerable to damage are the *critical facilities* within our community from:

[Critical facilities include airport, community shelter, bulk fuel storage tanks, generators, health clinic, law enforcement office (VPO, VPSO, police department), school, public works, e.g. washeteria/water treatment, reservoir/water supply, satellite dish, communications tower, landfills, sewage lagoons, and stores.]

a. Flooding?	0 1 2 3
b. Wildfire?	0 1 2 3

C. Earthquakes?	0 1 2 3
d. Volcanoes?	0 1 2 3
e. Snow Avalanche?	0 1 2 3
f. Tsunami/Seiches?	0 1 2 3
g. Severe weather storms?	0 1 2 3
h. Ground failure (landslide, permafrost)?	0 1 2 3
i. Coastal erosion?	0 1 2 3
j. Climate change?	0 1 2 3
k. Other hazards?	0 1 2 3

Please Specify:

3. How vulnerable to displacement, evacuation or life-safety is the community from:

a. Flooding?	0 1 2 3
b. Wildfire?	0 1 2 3
C. Earthquakes?	0 1 2 3
d. Volcanoes?	0 1 2 3
e. Snow Avalanche?	0 1 2 3
f. Tsunami/Seiches?	0 1 2 3
g. Severe weather storms?	0 1 2 3
h. Ground failure (landslide, permafrost)?	0 1 2 3
i. Coastal erosion?	0 1 2 3
j. Climate change?	0 1 2 3
k. Other hazards?	0 1 2 3

Please Specify:

4. Do you have a record of damages incurred during past flood events? Yes No

If yes, please describe:_____

_____

_____

Preparedness

Preparedness activities are often the first line of defense for protection of your family and the community. In the following list, please check those activities that you have done, plan to do in the near future, have not done, or are unable to do. *Please check one answer for each preparedness activity*.

Have you or someone in your household:	Have Done	Plan to do	Not Done	Unable to do
Attended meetings or received written information on natural disasters or emergency preparedness?	☐	☐	☐	☐
Talked with family members about what to do in case of a disaster or emergency?	☐	☐	☐	☐
Made a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?	☐	☐	☐	☐
Prepared a "Disaster Supply Kit" extra food, water, medications, batteries, first aid items, and other emergency supplies)?	☐	☐	☐	☐
In the last year, has anyone in your household been trained in First Aid or CPR?	☐	☐	☐	☐

5. Would you be willing to make your home more resistant to natural disasters? ☐ Yes ☐ No

6. Would you be willing to spend more money on your home to make it more disaster resistant? ☐ Yes ☐ No ☐ Don't know

7. How much <u>are you willing to spend</u> to better protect your home from natural disasters? *(Check only one)*

☐	Less than $100	☐	Desire to relocate for protection
☐	$100-$499	☐	Other, please explain
☐	$500 and above		
☐	Nothing / Don't know		
☐	Whatever it takes		

Mitigation Activities

A component of the Local Hazard Mitigation Plan activities is developing and documenting additional mitigation strategies that will aid the community in protecting life and property from the impacts of future natural disasters.

Mitigation activities are those types of actions you can take to protect your home and property from natural hazard events such as floods, severe weather, and wildfire. Please check the box for the following statements to best describe their importance to you. Your responses will help us determine your community's priorities for planning for these mitigation activities.

Statement	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important
Protecting private property	☐	☐	☐	☐	☐

Protecting critical facilities (clinic, school, washeteria, police/fire department, water/sewer, landfill)	☐	☐	☐	☐	☐
Preventing development in hazard areas	☐	☐	☐	☐	☐
Protecting natural environment	☐	☐	☐	☐	☐
Protecting historical and cultural landmarks	☐	☐	☐	☐	☐
Promoting cooperation within the community	☐	☐	☐	☐	☐
Protecting and reducing damage to utilities, roads, or water tank	☐	☐	☐	☐	☐
Strengthening emergency services (clinic workers, police/fire)	☐	☐	☐	☐	☐

8. Do you have other suggestions for possible mitigation actions/strategies?

_____

_____

_____

_____

_____

General Household Information

9. Please indicate your age: _____

and Gender: ☐ Male ☐ Female

10. Please indicate your level of education:

☐	Grade school/no schooling	☐	College degree
☐	Some high school	☐	Postgraduate degree
☐	High school graduate/GED	☐	Other, please specify
☐	Some college/trade school		

11. How long have you lived in Tanana?

☐ Less than 5 years ☐ 5 to 10 years ☐ 11 to 20 years ☐ 21 or more years

12. Do you have internet access? ☐ Yes ☐ No

13. Do you own or rent your home? ☐ Own ☐ Rent

If you have any questions regarding this survey or would like to learn about other ways that you can participate in the development of the Local Hazard Mitigation Plan, please contact the City Manager or Tribal Executive Director.

Thank You for Your Participation!

This survey may be submitted anonymously; however, if you provide us with your name and contact information below we will have the ability to follow up with you to learn more about your ideas or concerns (optional):

Name: _____

Address: _____

_____

Phone: _____