UNITED STATES AIR FORCE

Eielson Air Force Base, Alaska

Explanation of Significant Differences for the Interim Record of Decision for Community of Moose Creek, Alaska Long-Term Water Supply

Final

December 2024

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AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
AFFF	aqueous film-forming foam
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CONP	City of North Pole
CWMA	Critical Water Management Area
EAFB	Eielson Air Force Base
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
GAC	granular activated carbon
IFS	Interim Feasibility Study
IPP	Interim Proposed Plan
I-ROD	Interim Record of Decision
IRP	Installation Restoration Program
LUC	land use control
MCLs	Maximum Contaminant Levels
NCP	National Contingency Plan
NPL	National Priorities List
PFAS	per- and polyfluoroalkyl substances
PFC	perfluorinated compound
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PPT	parts per trillion
RACR	Remedial Action Completion Report
RAWP	Remedial Action Work Plan
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SEMS	Superfund Enterprise Management System
TCRA	time-critical removal action
UECA	Uniform Environmental Covenants Act
USAF	U.S. Air Force
WTA	water transition agreement
WTP	Water Treatment Plant

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United States Air Force Acceptance of the Explanation of Significant Differences for the Interim Record of Decision for Community of Moose Creek, Alaska Long-Term Water Supply
EIELSON AIR FORCE BASE, ALASKA

By my signature below, the United States Air Force approves the issuance of this Explanation of Significant Differences for the Interim Record of Decision for Moose Creek, Alaska, and the changes stated therein.

JOHNSON.KENNY.R.1231177740 Digitally signed by JOHNSON.KENNY.R.1231177740 Date: 2025.04.03 11:06:03 -05'00'

KENNY R. JOHNSON, P.E., GS-15, DAF
Director, Environmental Management
Air Force Civil Engineer Center

3 April 2025
Date

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United States Department of Environmental Protection Agency Acceptance of the Explanation of Significant Differences for the Interim Record of Decision for Community of Moose Creek, Alaska Long-Term Water Supply
EIELSON AIR FORCE BASE, ALASKA

By my signature below, the United States Environmental Protection Agency concurs with the issuance of this Explanation of Significant Differences for the interim Record of Decision for Moose Creek, Alaska, and the changes stated therein.

CALVIN TERADA

Digitally signed by CALVIN TERADA
Date: 2025.06.24 12:58:28 -07'00'

_____ _____

CALVIN J. TERADA, Director
Superfund and Emergency Management Division
Region 10, United States Environmental Protection Agency

Date

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Alaska Department of Environmental conservation Acceptance of the Explanation of Significant Differences for the Interim Record of Decision for Community of Moose Creek, Alaska Long-Term Water Supply
EIELSON AIR FORCE BASE, ALASKA

By my signature below, the Alaska Department of Environmental Conservation agrees that, when properly implemented, the revised remedies provided in this Explanation of Significant Differences for the interim Record of Decision for Moose Creek, Alaska comply with State law. This decision may be reviewed and revised in the future if information indicates the site may pose an unacceptable risk to human health, safety, welfare, or the environment.

DocuSigned by:
Stephanie Buss
ACA3A4435043402...

7/8/2025

STEPHANIE BUSS
Contaminated Sites Program Manager
Alaska Department of Environmental Conservation

Date

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1.0 INTRODUCTION

Name: Interim Record of Decision
Location: Moose Creek, AK

This Explanation of Significant Differences (ESD) documents significant changes to the remedy identified in the 2019 Interim Record of Decision (I-ROD) for Community of Moose Creek, Alaska, which is located approximately 120 miles south of the Arctic Circle, 21 miles southeast of Fairbanks, and 7 miles southeast of the City of North Pole (see Figure 1-1). The Moose Creek community is situated adjacent to the northern boundary of Eielson Air Force Base (EAFB), which is included in the Superfund Enterprise Management System (SEMS) under U.S. Environmental Protection Agency (EPA) Identification Number AK1570028646. The United States Air Force (USAF) is the lead agency for cleanup response for EAFB. The publication requirements for this ESD are set forth by: §117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); U.S. Code Title 42, §9617(c); and §300.435(c)(2)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), which is contained in Title 40 of the Code of Federal Regulations. This document will become publicly available as part of the EAFB Administrative Record. A public notice of availability and brief ESD description will be posted in the Daily News-Miner.

1.1 RECORD OF DECISION

The I-ROD for Community of Moose Creek, Alaska Long-Term Water Supply was signed by the USAF on 5 June 2019, U.S Environmental Protection Agency (EPA) on 10 June 2019, and by Alaska Department of Environmental Conservation (ADEC) on 6 June 2019 (USAF, 2019).

1.2 SUMMARY OF CIRCUMSTANCES NECESSITATING AN EXPLANATION OF SIGNIFICANT DIFFERENCES

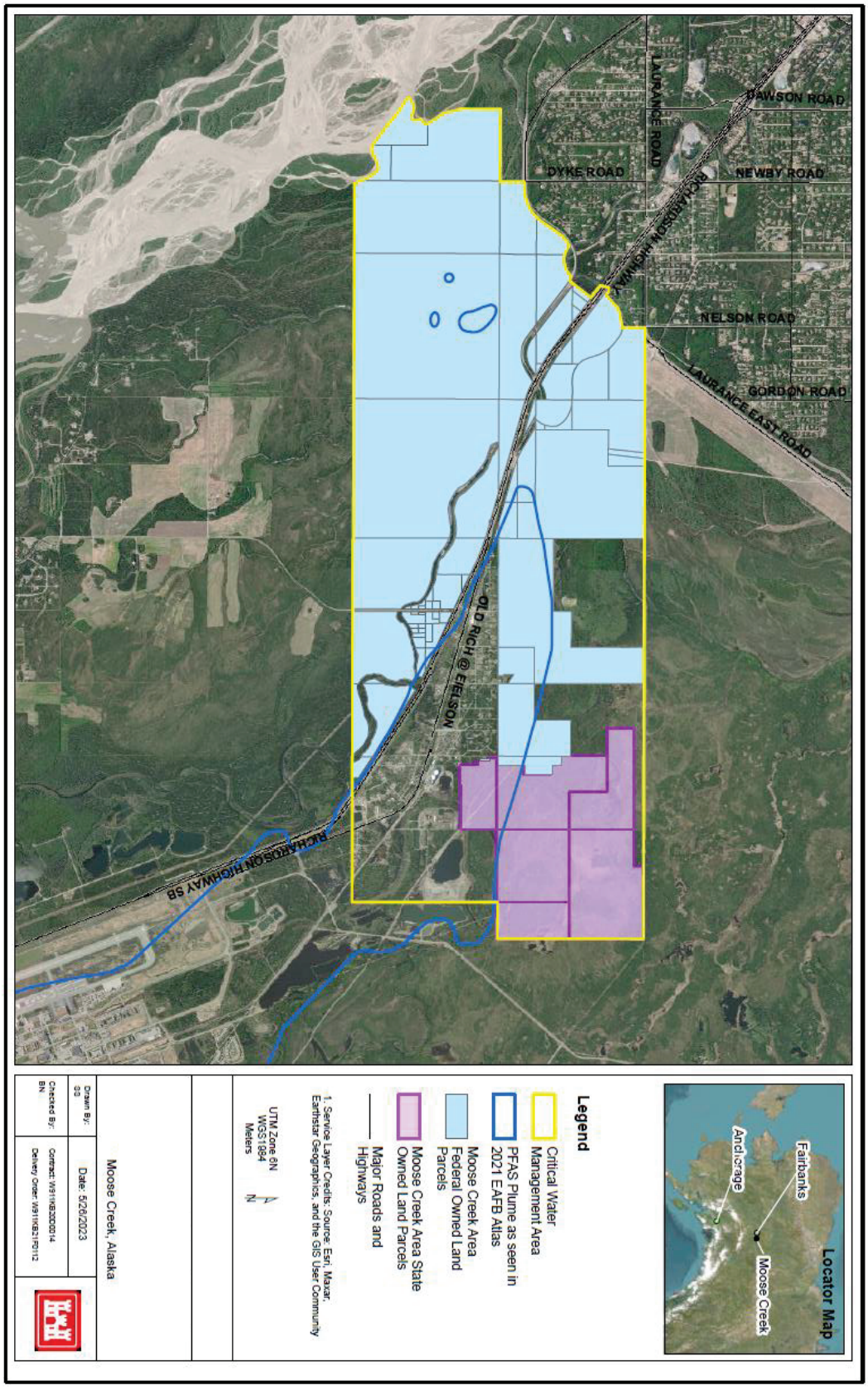
After a ROD is signed, new information may be received or generated that could affect the implementation of the remedy selected in the ROD or could prompt the reassessment of that remedy. The NCP contains the regulatory requirements for documenting post-ROD changes to the selected remedy and including such documentation in the Administrative Record. Post-ROD changes are classified in order of severity as non-significant/minor, significant, or fundamental. Significant changes generally involve a change to a component of a remedy that does not fundamentally alter the overall cleanup approach and are documented in an Explanation of Significant Differences. Implementation of the remedy for the Community of Moose Creek was initiated in 2019 and completed in 2022 (USAF, 2023). As part of the remedy outlined in the 2019 I-ROD, the USAF is to provide potable water supplied by the City of North Pole (CONP) Water Treatment Plant (WTP) to the community of Moose Creek. The purpose of this ESD is to document instances where the municipal water connection component of the selected remedy could not be implemented because properties could not meet the criteria to connect to municipal water or the distance for the connection to the main line was considered cost prohibitive to install.

There is no change to the Land Use Control (LUC) component of the selected remedy. Although not all properties currently have environmental covenants (ECs) and decommissioned wells, the USAF continues to pursue those measures with property owners as properties are sold, transferred, or foreclosed.

1.3 ADMINISTRATIVE RECORD

This ESD will be added to the EAFB Administrative Record, maintained by the USAF. The Administrative Record is open for public review and available online at https://ar.cce.af.mil.

Figure 1-1 Location and Vicinity Map



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2.0 SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

Per- and polyfluoroalkyl substances (PFAS) have migrated from contaminant sources on EAFB to the community of Moose Creek's groundwater, which was used to supply the community's drinking water. Detected concentrations of two PFAS chemicals (PFOS and PFOA) in the Moose Creek community's groundwater exceeded 70 parts per trillion (ppt), which is the actionable level established in the I-ROD. The interim response action selected in the I-ROD was necessary to protect public health or welfare from actual or threatened releases of pollutants or contaminants from EAFB, which may present an imminent and substantial endangerment to public health or welfare of the community of Moose Creek.

On 26 April 2024, EPA published a final National Primary Drinking Water Regulation establishing nationwide drinking water standards for certain PFAS under the Safe Drinking Water Act. The regulation includes maximum contaminant levels (MCLs) for five PFAS, to include PFOA and PFOS. The MCLs for PFOS and PFOA are both 4 parts per trillion (ppt). The selected remedy, as detailed in the I-ROD, and as updated by this ESD, will continue to be protective of human health by preventing the use and consumption of contaminated groundwater through the implementation of the CWMA, environmental covenants, municipal water connections, and water delivery service.

There have been no enforcement activities related to the PFOS and PFOA impacted groundwater in the community of Moose Creek's drinking water supply.

The community of Moose Creek is located adjacent to EAFB, which has used aqueous film forming foam (AFFF) firefighting agents containing PFAS in both training exercises and to extinguish petroleum fires on the base. AFFF formulations may contain PFOS, as well as some PFAS-based AFFF constituents that may further degrade into PFOA. Releases of AFFF to the environment have occurred during fire training, equipment maintenance, and storage at EAFB (USAF, 2018).

EAFB is an active military installation that has been used for military operations since its establishment in 1944. The base is in the Tanana River Valley along the northern bank of the river on a low, relatively flat, floodplain terrace approximately 2 miles from the active river channel. EAFB participates in the Installation Restoration Program (IRP), a program established in 1978 under which the U.S. Department of Defense seeks to identify, investigate, and clean up contamination from hazardous materials and pollutants or contaminants. A wide variety of source areas have been identified at EAFB including closed and active unlined landfills, drum storage area(s), fuel spill areas, fire training areas, and other disposal or spill areas (USAF, 2017a). Eielson AFB was listed on the National Priorities List (NPL) in 1989 (54 Federal Register [FR] 48184) by the EPA due to historical contamination at the base. The listing designated the facility as a federal Superfund site subject to the remedial response requirements of CERCLA, as amended by SARA (USAF, 2017b). The USAF is the lead agency, the EPA is the lead regulatory agency, and the ADEC is the support regulatory agency.

2.1 PREVIOUS INVESTIGATION ACTIVITIES

In 2014, the USAF conducted screening level site investigations at EAFB to determine the presence of PFOS and PFOA and their relative concentrations. The site investigation report associated with that work was finalized in February 2015 (USACE, 2015a) and documented both PFOA and PFOS at concentrations in groundwater above 2015 recommended health advisory levels of 400 ppt in the case of PFOA and 200 ppt in the case of PFOS (USEPA, 2009).

In January 2015, EPA Region 10 requested that EAFB test the drinking water wells on base to determine if PFOS or PFOA were present. The USAF conducted site inspections following the CERCLA process. Sampling confirmed both chemicals in EAFB drinking water wells (USAF, 2018). Since PFOS and PFOA are water soluble, an additional site inspection was conducted to determine whether contaminants had migrated in groundwater towards the northern base boundary and to the nearby community of Moose Creek.

In April 2015, the USAF tested the groundwater at the northern base boundary, which abuts the community of Moose Creek, and identified PFOS levels exceeding 200 ppt near the base boundary (USACE, 2015a). As a result of the identification, the USAF coordinated with the community of Moose Creek to test private drinking water wells, starting in May 2015 (USACE, 2015b). This testing showed that 170 out of 174 properties with private drinking water wells in the community of Moose Creek had water exceeding the 2015 EPA recommended health advisory levels for PFOA and PFOS in drinking water.

The USAF conducted an emergency removal action to provide bottled drinking water to the community of Moose Creek. The emergency action was followed by a time-critical removal action (TCRA) to mitigate the health threat posed by the PFOS and PFOA in the drinking water (AFCEC, 2015). This TCRA included the delivery of bottled water and installation of potable water tanks or granular activated carbon (GAC) filter systems at the affected private properties. The USAF installed 181 systems at properties in the Moose Creek community (117 storage tanks and 64 GAC filter systems). Properties that did not have treatment systems installed were provided with delivered bottled water.

A limited Interim Feasibility Study (IFS) was developed in 2017 to determine potential remedies for the community of Moose Creek drinking water supply. The findings were presented to the community during a July 2017 public meeting. The Interim Proposed Plan (IPP) for the community of Moose Creek drinking water supply was released for public comment in April 2018, with the public comment period extending from 15 April 2018 to 15 May 2018. A notice was placed in the Fairbanks Daily News-Miner inviting public comment on the IPP and announcing a public meeting (USAF, 2018). The public meeting to discuss the IPP was held on 23 April 2018. The IFS and IPP can be found in the Administrative Record file for EAFB.

2.2 SELECTED REMEDY

The selected interim remedy is limited in scope and addresses only the provision of an alternative domestic water supply to the community of Moose Creek (USAF, 2019). The selected interim action is designed to protect human health in the short-term while a comprehensive final remedial solution, which will be documented in a Final ROD, is being developed.

The selected interim remedy is to provide potable water supplied by the CONP WTP to the community of Moose Creek. Following are the major components of the selected remedy:

- A new water main will be installed to connect the CONP WTP to the community of Moose Creek. A local distribution system, holding tank, and circulation pumping station will be constructed to serve the community, and local connections will be made to affected properties in the community of Moose Creek.
- The new system will be maintained and operated by the North Pole Municipality, which will collect water use charges from property owners, and operate and maintain the system for the residents of Moose Creek.
- Land use controls (LUCs) will be required to prohibit the use of contaminated groundwater.
- The LUCs will include a Critical Water Management Area (CWMA), which will be established to prevent the use of contaminated groundwater and prohibit the installation of new water wells within the CWMA.
- The Alaska Uniform Environmental Covenants Act (UECA) will require the recording of environmental covenants on all impacted real properties in accordance with Alaska statutory law. The USAF will negotiate agreements with impacted landowners to:
    - decommission existing wells
    - discontinue use of the property groundwater for any purpose
    - provide access for USAF monitoring of groundwater/LUCs
    - place a covenant on the property to prohibit future well installation/ contaminated-groundwater use.
- In addition, the previously installed water tanks and GAC systems will be removed, and tanker and bottled water delivery would stop.

2.2.1 REMEDY IMPLEMENTATION

Design of the new water main began in January of 2019, with construction commencing between spring of 2020 through fall of 2022 (USAF, 2023). Design began with a charrette, during which routing options were presented to regulatory agency representatives, land management agencies, and other relevant stakeholders. A concept design memorandum was finalized on May 10, 2019, detailing the following design needs:

- Replace well pumps at the existing CONP water wells to accommodate increased water demand.
- Modify CONP's existing water rights permit to accommodate system expansion.
- Add a greensand filter, pressure pumps, meter equipment, and a new generator to CONP's water treatment plant to expand water treatment capacity.
- Install a 410,000-gallon storage tank in Moose Creek to maintain the capacity to serve 2 days at the peak summer day rate.

- Construct a pump house in Moose Creek to house pumping and heating equipment that supports CONP's distribution system in Moose Creek.
- Construct a 6-mile-long transmission line to connect CONP's existing distribution system to the storage tank and pump house in Moose Creek.
- Construct two distribution loops, totaling 12 miles in length, to serve the Moose Creek community. The north loop is oriented primarily north of the Richardson Highway and the south loop primarily south of the Richardson Highway.
- Install approximately 220 service lines extending from the distribution main nearest to each structure to connect to the existing plumbing inside the home or business.

Affected properties with habitable structures (referred to as eligible water customers), whether they contained a well or not, were offered connection to the CONP water system (a water service). Before installing water services, water customers were required to meet water connection criteria, including permanent year-round heat and power and a functional septic system. CONP required that all water customers meet these criteria to protect water services from freezing and bursting, which would cause pressure loss and increase chances of contamination.

3.0 BASIS FOR THE EXPLANATION OF SIGNIFICANT DIFFERENCES

As part of the remedy for the I-ROD, eligible water customers were to be connected to the CONP water system. Eligible water customers were defined as properties with habitable structures for connection, whether the properties had wells or not. Of the 192 eligible water customers, 179 properties were connected to the CONP water system. The purpose of this ESD is to amend the selected remedy for those properties where the property owner requested a municipal water connection to the CONP water system, and the USAF was unable to provide the connection because the property could not meet the municipal water connection criteria or where the distance for the connection to the main line was considered cost prohibitive to install. This ESD describes these circumstances and explains the resulting significant differences in the amended remedy.

3.1 EXPANSION OF CONP WATER SYSTEM

Expanding the CONP water system to the Moose Creek community involved constructing a 410,000-gallon water holding tank and pump house in Moose Creek, installing 18 miles of water main, and upgrading CONP's existing infrastructure to provide the additional capacity needed to serve Moose Creek. Construction of the expanded water system is documented in Appendix G of the Draft-Final Moose Creek Remedial Action Completion Report (RACR).

3.2 PROPERTIES WITH SIGNIFICANT DIFFERENCES FROM THE SELECTED REMEDY

To be connected to the CONP water system, property owners had to agree to the terms of a water transition agreement (WTA). Owners had to agree to and sign for one of three options on the WTA:

- Option A - connection to the CONP water system with financial consideration,
- Option B - connection to the CONP water system without a financial consideration, or
- Option C - no connection, no financial consideration.

Owners signing for Option A agreed to have their property connected to the CONP water system at USAF expense, and to receive a financial consideration from the USAF for agreeing to execute an environmental covenant on the property. Owners signing for Option B agreed to be connected to the CONP water system at USAF expense, but without a financial consideration from the USAF as these owners did not agree to execute an environmental covenant on the property. Owners signing for Option C did not agree to connect to the CONP water system at USAF expense and did not agree to grant an environmental covenant on the property.

Owners agreeing to option A or B had additional paperwork to complete as part of the WTA paperwork. The paperwork included the following:

- Property Owner Utility Service Contract Application,

- Utility Tie-In Application, and
- Well Decommissioning Agreement.

Certain properties were not considered to be an eligible water customer or requested a municipal water connection but could not meet the connection criteria. The USAF's inability to provide the municipal water connection component of the selected remedy in these cases resulted in significant differences from the selected remedy. These differences are summarized as follows:

The USAF could not provide the selected remedy to one property located outside of the expanded water system service area. Construction of a utility line to a single property was cost prohibitive. Therefore, any such property was not counted as an eligible water customer. The USAF is providing water delivery in the form of bottled water or water delivered to an on-property tank for this category in place of the selected remedy component of connection to the municipal water system.

The USAF could not provide the selected remedy to three properties that signed a WTA authorizing a water service connection but did not meet the water connection criteria of permanent year-round heat and power and a functional septic system. Two of these properties are occupied and the USAF will continue to provide water delivery in place of a municipal water connection.

3.3 OTHER PROPERTIES WITH NO CHANGE IN REMEDY

In addition to the four properties listed in section 3.2, the following are other properties not connected to the CONP water system. These are summarized as follows:

- Four potential water customers did not sign a water transition agreement (WTA) authorizing the connection of their property to the CONP water system.
    - Three of these property owners created safety concerns. Two of the three displayed hostile and threating behavior towards government employees and/or contract employees working for the government. The third property owner had aggressive dogs within the perimeter fence of the property that prevented attempts by contract employees working for the government to make in-person contact with the owner.
    - One property owner declined water service because they did not want to use CONP water.
- Six potential water customers with unoccupied houses on their properties declined to enter into WTAs authorizing a connection to the CONP water system.

There is no change in the remedy for these properties. In contrast to the properties in section 3.2 that requested a municipal water connection by signing a WTA and did not meet the connection criteria, the properties in this section declined a municipal water connection.

3.4 IMPACTS TO SELECTED REMEDY

I-ROD Selected Remedy Component	ESD Impact
A new water main will be installed to connect the City of North Pole WTP to the community of Moose Creek. A local distribution system, holding tank, and circulation pumping station will be constructed to serve the community, and local connections will be made to affected properties in the community of Moose Creek.	With exception to local connections, all other components were accomplished. Changes to this remedy component includes the delivery of tank or bottled water in place of municipal connection for properties where connection was requested, but the property could not meet the service line connection requirements. As a result, the USAF could not connect the property to municipal water. This also applied to properties outside of the water service area. Refer to Section 3.2 for details concerning affected properties.
The new system will be maintained and operated by the North Pole Municipality, which will collect water use charges from property owners, and operate and maintain the system for the residents of Moose Creek.	No Impact
LUCs will be required to prohibit the use of contaminated groundwater. The LUCs will include a CWMA, which will be established to prevent the use of contaminated groundwater and prohibit the installation of new water wells within the CWMA.	No Impact
The Alaska UECA will require the recording of environmental covenants on all impacted real properties in accordance with Alaska statutory law. The USAF will negotiate agreements with impacted landowners to: 1) decommission existing wells, 2) discontinue use of the property groundwater for any purpose 3) provide access for USAF monitoring of groundwater/LUCs, and 4) place a covenant on the property to prohibit future well installation/ contaminated-groundwater use.	No Impact. While not all properties currently have ECs or wells decommissioned, USAF continues to pursue such LUCs as these properties change ownership or foreclose.
In addition, the previously installed water tanks and GAC systems will be removed, and tanker and bottled water delivery would stop.	Of the 64 GAC treatment systems and 117 tanks installed, only 63 GAC systems and 106 tanks were removed. In most of the 11 instances where tanks were not removed, the Air Force either could not arrange access to the property for the tank removal or left the tank in place for water delivery purposes as requested by the property owner, e.g., properties that had requested a municipal water connection, but the structure on the property could not accommodate such a connection.

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4.0 STATUTORY DETERMINATION

The selected remedy for the Interim Record of Decision for Community of Moose Creek, Alaska, Long-Term Water Supply, as stated in the 2019 I-ROD, and modifications herein, remain protective of human health and the environment under CERCLA §121, and all federal and state requirements that are applicable or relevant and appropriate to the remedial action have been satisfied.

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5.0 PUBLIC PARTICIPATION REQUIREMENTS

This ESD and Administrative Record for the Interim Record of Decision for Community of Moose Creek Alaska, Long-term Water Supply are available for public review as presented in Section 1.3. The ESD release notification will be posted in the Fairbanks News-Miner to satisfy the requirements in NCP §300.435(c)(2)(i).

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6.0 REFERENCES

ADEC, 2017 (November). Oil and Other Hazardous Pollution Control Regulations—Discharge Reporting, Cleanup, and Disposal of Oil and Other Hazardous Substances. 18 AAC 75.

Air Force Civil Engineer Center (AFCEC), 2015. Final Action Memorandum for a Time-Critical Removal Action of PFC-Contaminated Water at Moose Creek, Alaska. 18 November.

U.S. Army Corps of Engineers (USACE), 2015a. Final Site Investigation Report for Site Investigations of Fire Fighting Foam Usage at Various Air Force Bases in the United States for Eielson Air Force Base. February.

USACE, 2015b. Final Addendum #2 to the Perfluorinated Compounds (PFCs) Investigation Work Plan at Eielson Air Force Base, Alaska. Prepared by EA Engineering. July.

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USAF, 2017b. Eielson Air Force Base Final Interim Feasibility Study for Community of Moose Creek, Alaska, Long-Term Drinking Water Supply. October.

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USEPA, 2016. EPA–HQ–OW–2014–0138/ FRL–9946–91– OW. Lifetime Health Advisories and Health Effects Support Documents for Perfluorooctanoic Acid and Perfluorooctane Sulfonate. November. (rescinded)