

Deactivated SM-1A Nuclear Reactor Facility Decommissioning and Dismantlement Draft Environmental Assessment

February 2021



UNITED STATES ARMY GARRISON ALASKA FORT GREELY
DELTA JUNCTION, ALASKA



**US Army Corps
of Engineers®**



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DRAFT ENVIRONMENTAL ASSESSMENT DECOMMISSIONING AND DISMANTLEMENT OF THE DEACTIVATED SM-1A NUCLEAR POWER PLANT

United States Army Garrison Alaska Fort Greely

Approved By:

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US Army Corps
of Engineers ®



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Abstract

Lead Agency: United States Army Corps of Engineers

Title of Proposed Action: Decommissioning and Dismantlement of the Deactivated SM-1A Nuclear Power Plant, United States Army Garrison Alaska Fort Greely

Designation: Draft Environmental Assessment

Prepared by: United States Army Corps of Engineers, Baltimore District

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EA Available: <https://www.nab.usace.army.mil/SM-1A/>
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Abstract: The United States Army Corps of Engineers (USACE) has prepared this Draft Environmental Assessment (EA) to evaluate the potential environmental consequences from the Army's Proposed Action to decommission and dismantle the deactivated Stationary Medium Power Model 1A (SM-1A) Nuclear Power Plant at United States (U.S.) Army Garrison Alaska Fort Greely (Fort Greely) and release the property for unrestricted use. In its current condition, SM-1A does not support the Army's mission in Alaska or at Fort Greely. The **purpose** of the Proposed Action is to: 1) safely remove, transport, and dispose of all materials and equipment (M&E), structures, and residual contamination associated with SM-1A; 2) release the SM-1A site for unrestricted use in accordance with U.S. Nuclear Regulatory Commission (NRC) radiological dose criteria established in 10 Code of Federal Regulations (CFR) 20.1402, *Radiological criteria for unrestricted use* and adopted by the Army; and 3) terminate the U.S. Army-issued SM-1A decommissioning permit. The **need** for the Proposed Action is to complete the decommissioning of SM-1A within 60 years (by 2032) of permanent cessation of operations in accordance with NRC regulation 10 CFR 50.82(a)(3) and Army Regulation (AR) 50-7, *Army Reactor Program* (17 November 2016), which establishes the Army's intent to follow NRC guidelines. USACE implements the decommissioning of deactivated Army nuclear power plants and ensures compliance with associated environmental and safety requirements in accordance with AR 50-7.

This Draft EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (Title 42, United States Code [USC] 4321 et seq.); the NEPA-implementing regulations of the Council on Environmental Quality (CEQ)¹ (40 CFR 1500–1508) (1978, as amended in 1986 and 2005); and the Army's NEPA regulations (32 CFR 651, *Environmental Analysis of Army Actions*). This Draft EA examines the

¹ Substantive preparation of this Draft EA began prior to updates to the CEQ regulations implementing NEPA that became effective on September 14, 2020. Therefore, this Draft EA has been prepared in accordance with the NEPA regulations that were previously in effect.

potential environmental impacts of the Proposed Action and its alternatives on the following environmental resources: cultural resources, water resources, socioeconomics and environmental justice, biological resources, air quality, transportation and traffic, utilities, soils, waste, and safety and health. With implementation of best management practices (BMPs) and minimization measures, the Draft EA concludes that adverse impacts would not meet the conditions requiring preparation of an Environmental Impact Statement (EIS) (32 CFR 651.41, *Conditions requiring an EIS*). The Proposed Action would have no significant adverse impacts on the natural or human environment; therefore, it is not an action normally requiring preparation of an EIS (32 CFR 651.42, *Actions normally requiring an EIS*).

Executive Summary

ES.1 Introduction

The United States Army Corps of Engineers (USACE), Baltimore District proposes to decommission and dismantle the deactivated Stationary Medium Power Model 1A Nuclear Power Plant (SM-1A) at United States (U.S.) Army Garrison Alaska Fort Greely (Fort Greely) and release the property for unrestricted use (Proposed Action). SM-1A was deactivated in 1972 and has been maintained in a safe storage (SAFSTOR) condition since that time. The decommissioning of a nuclear reactor is required within 60 years of permanent cessation of operations in accordance with U.S. Nuclear Regulatory Commission (NRC) regulation 10 Code of Federal Regulations (CFR) 50.82(a)(3) and Army Regulation (AR) 50-7, *Army Reactor Program* (17 November 2016), which establishes the Army's intent to follow NRC guidelines. Therefore, the decommissioning of SM-1A must be completed by 2032. In its current condition, SM-1A does not support the Army's mission in Alaska or at Fort Greely.

USACE has prepared this Draft Environmental Assessment (EA) to analyze the Proposed Action's potential environmental impacts in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (Title 42, United States Code [USC] 4321 et seq.); the NEPA-implementing regulations of the Council on Environmental Quality (CEQ)² (40 CFR 1500–1508) (1978, as amended in 1986 and 2005); and the Army's NEPA regulations (32 CFR 651, *Environmental Analysis of Army Actions*). USACE implements the decommissioning of deactivated Army nuclear power plants and ensures compliance with associated environmental and safety requirements in accordance with AR 50-7.

ES.2 Project Background and Setting

SM-1A is on an approximately 1.5-acre fenced site in the central portion of Fort Greely. Fort Greely covers approximately 6,840 acres near Delta Junction, Alaska, approximately 100 miles southeast of Fairbanks. The deactivated reactor and associated systems are primarily in a cylindrical structure known as the Vapor Container (VC), adjacent to Building 606 North. Building 606 North and Building 606 South also contain critical infrastructure associated with Fort Greely's existing utility systems. Other facilities associated with SM-1A include the waste tanks pit, the spent fuel pit, and Building J-5 (also known as Building 607).

SM-1A was built between 1958 and 1962, and operated from 1962 to 1972. Its primary mission was to supply electrical power and heating steam for on-post buildings and facilities at Fort Greely. SM-1A was also used as an in-service test facility to understand how the equipment would function in an arctic environment. SM-1A has been maintained in a SAFSTOR condition since its deactivation in 1972. USACE maintenance of SM-1A

² Substantive preparation of this EA began prior to updates to the CEQ regulations implementing NEPA that became effective on September 14, 2020. Therefore, this Draft EA has been prepared in accordance with the NEPA regulations that were previously in effect.

in its SAFSTOR condition includes routine inspections, monitoring, and other permit-required activities.

Buildings 606 North, 606 South, and Building J-5 (also known as Building 607) are owned and occupied by Fort Greely's utility privatization (UP) contractor (Doyon Utilities, LLC). The UP contractor operates and maintains Fort Greely's utility systems under the terms of a 50-year UP contract that was issued by the Defense Logistics Agency (DLA) in 2007. The federal government retains ownership of structures and equipment associated with SM-1A. Access to unrestricted areas and equipment associated with SM-1A is controlled by the UP contractor. Access to restricted areas containing radioactive materials and waste is controlled by USACE. The Army owns the land underlying the facilities associated with SM-1A.

ES.3 Army Reactor Program and Regulatory Authority

USACE maintains SM-1A in accordance with AR 50-7 and Reactor Possession Permit No. SM1A-1-19, Amendment 1-20 issued by the U.S. Army Deputy Chief of Staff G-3/5/7 through the Army Reactor Office (ARO). The ARO, established by the U.S. Army, oversees the Army Reactor Program (ARP) and designates the ARP manager.

The Atomic Energy Act (AEA) of 1954 (42 USC 2011 et seq.) provides the Army with the authority to establish the ARO and administer the ARP. AR 50-7 implements this authority and sets forth program policies consistent with NRC regulations, including decommissioning criteria set forth in 10 CFR 20 Subpart E, *Radiological Criteria for License Termination*. Today, the ARP helps ensure that Army reactors are decommissioned in a manner that is consistent with federal regulatory standards and guidelines, including those put forth by NRC, National Council on Radiation Protection (NCRP), and American National Standards Institute (ANSI). It is Army policy to implement decommissioning projects consistent with NRC guidelines as well as the recommendations of NCRP and ANSI.

ES.4 Proposed Action

Under the Proposed Action, USACE would: 1) complete the proposed decommissioning and dismantlement of SM-1A in accordance with an ARO-approved Decommissioning Plan (DP); 2) terminate the U.S. Army-issued SM-1A decommissioning permit; and 3) release the SM-1A site for unrestricted use in accordance with NRC regulations established in 10 CFR 20.1402, *Radiological criteria for unrestricted use*, and adopted by the Army. Implementation of the Proposed Action would occur over approximately 6 years, beginning in 2022 and ending in 2028.

The Proposed Action would be implemented primarily in a 1.5-acre area that includes Building 606 North, the VC, Building J-5 (also known as Building 607), and an approximately 18,000-square-foot (0.4-acre) gravel parking area immediately north of Building 606 North. Major phases of the Proposed Action evaluated in the Draft EA include:

1. Mobilization and site preparation, and establishment of exterior controlled area boundary and radiological control points
2. Building J-5 disposition
3. Building 606 North disposition
4. Other exterior system removals, remediation, and final status surveys
5. Site restoration
6. Demobilization

The Proposed Action would require the complete dismantlement of Building 606 North, the VC, and Building J-5 to remove components of SM-1A in those buildings. Building materials and underlying soils impacted by residual contamination associated with the reactor's operation would also be removed. Removal of these buildings, materials, and soils would support release of the site in accordance with unrestricted use criteria in 10 CFR 20.1402. UP contractor operations must relocate for the duration of the Proposed Action to Building 606 South. UP contractor operations may also relocate to a temporary modular office and storage facility that may be erected on the southwest side of Building 606 South, and an approximately 1,000 square foot permanent addition that may be built on the southeast corner of Building 606 South. Relocation of UP contractor operations to the southern portion of Building 606 must occur prior to the implementation of Phase 1 of the proposed decommissioning activities as listed above. The southern portion of Building 606 would be physically isolated from the northern end for the duration of the Proposed Action. Following decommissioning, the UP contractor may rebuild in-kind administrative and storage facilities on the footprint of the existing Building 606 North.

All waste generated during the Proposed Action would be initially transported from the SM-1A site by trucks. To the extent practicable, non-radioactive construction and demolition (C&D) waste that does not contain regulated solid waste (e.g., lead, polychlorinated biphenyls [PCBs]), would be recycled, or disposed of at one or more on-post or off-post municipal waste and/or C&D waste landfills. There are no NRC-permitted radiological waste disposal facilities in Alaska. Additionally, with the exception of certain types of asbestos-containing materials (ACM), the disposal of most non-radioactive solid waste regulated under the Resource Conservation and Recovery Act (RCRA) of 1976 (42 USC 6901 et seq.) and the Toxic Substances Control Act (TSCA) of 1976 (15 USC 2601 et seq.) is prohibited in Alaska. Therefore, all radioactive waste and most non-radioactive regulated solid waste generated by the Proposed Action would be transported to permitted facilities in the contiguous 48 states for disposal. Radioactive waste and non-radioactive regulated solid waste would be managed, characterized, packaged, transported, and disposed of in accordance with applicable federal and state regulatory requirements. Initial shipments of waste from the SM-1A site would be expected to begin in the summer of 2023. The transportation of waste by air or by truck and/or rail through Canada from Fort Greely to disposal facilities in the contiguous 48 states is not currently anticipated, and is not addressed in the Draft EA.

Site restoration activities under the Proposed Action would occur following the removal of facilities and infrastructure associated with SM-1A, and verification that the release criteria have been achieved. The SM-1A site would be considered suitable for release for unrestricted use once it is determined that the average member of a critical group would

not receive a total effective dose equivalent in excess of 25 millirem (mrem) per year above background radiation levels on the site, in accordance with radiological dose criteria in 10 CFR 20.1402. Following completion of the Proposed Action, future use or redevelopment of the SM-1A site would be at the discretion of Fort Greely and the UP contractor. NEPA documentation would be prepared separately from the Draft EA as applicable for future use or redevelopment of the site.

ES.5 Purpose and Need

The **purpose** of the Proposed Action is to safely remove, transport, and dispose of all materials and equipment (M&E), structures, and residual contamination associated with SM-1A; release the SM-1A site for unrestricted use in accordance with radiological dose criteria established by the NRC in 10 CFR 20.1402 and adopted by the Army; and terminate the U.S. Army-issued SM-1A decommissioning permit. The **need** for the Proposed Action is to complete the decommissioning of SM-1A within 60 years (by 2032) of permanent cessation of operations in accordance with NRC regulation 10 CFR 50.82(a)(3) and AR 50-7, *Army Reactor Program* (17 November 2016), which establishes the Army's intent to follow NRC guidelines.

SM-1A has been maintained in a SAFSTOR condition and subject to regular inspection and monitoring for 48 years. In its current condition, SM-1A does not support the Army's mission on Fort Greely, now or in the future. The Proposed Action would enable USACE to meet Army mission objectives to decommission SM-1A, terminate the U.S. Army SM-1A decommissioning permit, and release the underlying land for unrestricted use.

ES.6 Scope of the Environmental Assessment

The Draft EA analyzes the Proposed Action's potential adverse, beneficial, and cumulative effects on the human and natural environment at, and in the vicinity of, SM-1A and Fort Greely. Potential impacts from the No Action Alternative are also analyzed in the Draft EA in accordance with CEQ NEPA regulations in 40 CFR 1502.14, *Alternatives Including the Proposed Action*.

The Proposed Action's potential effects are analyzed in the Draft EA for the following resources: cultural resources; water resources; socioeconomic and environmental justice; biological resources; air quality; transportation and traffic; utilities; soils; waste; and safety and health. The following resources were dismissed from analysis in the Draft EA because the Proposed Action would have no potential to meaningfully or measurably affect them: airspace, land use, noise, recreation, seismology, geology and topography, and visual resources.

ES.7 Alternatives

ES.7.1 No Action Alternative

Under the No Action Alternative, USACE would continue to maintain SM-1A in a SAFSTOR condition under its current Reactor Possession Permit (SM1A-1-19, Amendment 1-20). Decommissioning would not take place within 60 years (by 2032) of SM-1A's deactivation. The No Action Alternative does not meet the Proposed Action's purpose and need. However, it is analyzed in the Draft EA in accordance with 40 CFR

1502.14 to provide a comparative baseline for the analysis of potential effects from the Proposed Action Alternative (**Section ES.7.2**).

ES.7.2 Proposed Action Alternative

The Proposed Action Alternative would implement the Proposed Action as summarized in **Section ES.4**. The Proposed Action Alternative would fulfill the Proposed Action’s purpose and need by completing the decommissioning and dismantlement of SM-1A within 60 years of its final shutdown (by 2032), releasing the SM-1A site for unrestricted use, and terminating the U.S. Army-issued decommissioning permit.

Following the implementation of the Proposed Action Alternative, no remnants of SM-1A would remain on the site.

ES.8 Environmental Impact Minimization

The Proposed Action Alternative would incorporate the best management practices (BMPs) listed in **Table ES-1** to proactively minimize environmental impacts and comply with applicable environmental regulatory requirements.

Table ES-1: Best Management Practices Applicable to the Proposed Action Alternative

Resource Area	BMP
Cultural Resources (Draft EA Section 3.2)	In consultation with the Alaska SHPO and other participating consulting parties, execute a MOA with stipulations to resolve adverse effects on historic properties in accordance with 36 CFR 800.6(c).
	Adhere to the unanticipated discovery plan set forth in the 2020-2025 USAG Alaska ICRMP in the event that a previously unidentified archaeological site, which could include human remains, funerary or sacred objects, or other items of cultural patrimony, is discovered during the Proposed Action Alternative.
Water Resources (Draft EA Section 3.3)	Prepare and adhere to a site-specific SWPPP as a condition of coverage under the CGP to manage the quality and quantity of stormwater discharged from the SM-1A site.
	Capture, containerize, and characterize contact water from decommissioning activities (e.g., wet saw cutting, power washing, decontamination) and dispose of accordingly at permitted off-post facilities, in accordance with a site-specific liquid effluent monitoring plan that would be prepared as part of the project-specific Environmental Monitoring and Control program.
	Prepare and adhere to a project- and site-specific SPCC Plan.
	In accordance with the SPCC Plan, provide spill containment and cleanup kits in conspicuous and accessible locations throughout the SM-1A site for use in the event of an unintended release of contaminants or regulated materials.
Socioeconomics and Environmental Justice (Draft EA Section 3.4)	Continue public engagement with local communities on and around Fort Greely throughout the duration of the Proposed Action Alternative.
	Continue to maintain information regarding the Proposed Action Alternative on the USACE project website (https://www.nab.usace.army.mil/SM-1A/).
	BMPs identified for other resources listed in this table would minimize potential adverse impacts on nearby on- and off-post communities, particularly from noise, air pollutant emissions, fugitive dust, traffic, waste, and safety and health. Adherence to these BMPs would ensure that potential impacts on environmental justice communities are not disproportionately adverse.
Biological Resources	Adhere to applicable policies and practices set forth in the Fort Greely Draft INRMP to prevent or minimize the introduction and spread of invasive plant species, such as only using certified weed-free seed mixtures during revegetation.

Table ES-1: Best Management Practices Applicable to the Proposed Action Alternative

Resource Area	BMP
(Draft EA Section 3.5)	Use spotters or escort vehicles, as determined necessary, to minimize the risk of collisions with moose or other wildlife during on-post vehicle operations (e.g., waste transport).
	Coordinate with the Fort Greely Directorate of Public Works, Environmental Division, to determine the most appropriate course of action if an active MBTA-protected bird nest is observed on the SM-1A site.
Air Quality (Draft EA Section 3.6)	Directly load (i.e., do not stockpile) radioactive waste and non-radioactive regulated solid waste into appropriate containers for transport.
	Transport radioactive waste and non-radioactive regulated solid waste in closed containers meeting applicable regulatory requirements.
	Cover payloads of C&D waste and backfill soils in trucks while in transit.
	Periodically spray water on on-post paved and unpaved haul roads, as weather conditions allow.
	Cover clean backfill soil stockpiles or periodically spray with water, as weather conditions allow.
Transportation and Traffic (Draft EA Section 3.7)	Use trained and qualified contractors to transport waste in accordance with applicable federal and state regulatory requirements for disposal at permitted on-post and/or off-post facilities.
	Implement a transportation management plan that identifies approved on-post travel routes to and from the SM-1A site for heavy trucks transporting materials, equipment, and waste.
	Schedule decommissioning-related traffic (particularly heavy truck traffic) for off-peak hours when feasible and in coordination with Fort Greely and other affected organizations.
	Package and ship all radioactive and non-radioactive waste in accordance with the WTDP, as well as applicable regulatory and permit requirements established by NRC, USDOT (including IMDG), USEPA, the State of Alaska, and other agencies.
Utilities (Draft EA Section 3.8)	Coordinate with potentially affected facilities regarding temporary planned utility service shutoffs or disruptions to prevent or minimize impacts on their operations.
	Sequence or stagger temporary planned utility service shutoffs or disruptions to the extent feasible.
Soils (Draft EA Section 3.9)	Prepare and adhere to a project- and site-specific SWPPP as a condition of coverage under the CGP. Adherence to the SWPPP would manage the quantity and quality of stormwater discharged from the SM-1A site, prevent or minimize the migration of temporarily disturbed or stockpiled soils, and the corresponding sedimentation of receiving waterbodies.
	Replace soils excavated from the SM-1A site with clean fill soils meeting applicable Fort Greely requirements.
	Implement an environmental monitoring plan and conduct soil sampling to support release of the site.
	Conduct an FSS following the removal of SM-1A facilities and infrastructure to ensure remaining soils meet the unrestricted release criteria.
Waste (Draft EA Section 3.10)	Prepare and adhere to a Hazardous Material Abatement Plan in accordance with EM 385-1-1, <i>Safety and Health Requirements</i> to establish procedures for the management and disposition of non-radioactive regulated solid waste.
	Implement a Waste Management and Disposal Plan that would establish procedures and requirements for the safe management, handling, storage, and transportation of waste to optimize safety and prevent or minimize risks to the extent possible.

Table ES-1: Best Management Practices Applicable to the Proposed Action Alternative

Resource Area	BMP
	Manage and dispose of non-radioactive regulated solid waste in accordance with applicable requirements established by USEPA through its enforcement of RCRA, TSCA and those established by ADEC, where applicable.
	Prepare and adhere to a project- and site-specific SPCC Plan to prevent or minimize the potential for accidental spills of petroleum products or other regulated materials from decommissioning-related vehicles and equipment, and establish procedures for containing and cleaning up any spills that may occur.
	Provide spill containment and cleanup kits in conspicuous and accessible locations throughout the SM-1A site in accordance with the SPCC Plan for use in the event of an unintended release of regulated materials.
Safety and Health (Draft EA Section 3.11)	Implement an Industrial Safety Program to establish safety and health procedures, practices, and the use of PPE.
	In accordance with EM 385-1-1, implement a site- and project-specific APP that would describe the specific work, work processes, equipment to be used, and hazards pertaining to the decommissioning activities.
	Implement a Waste Management and Disposal Plan that would establish procedures and requirements for the safe management, handling, storage, and transportation of waste to optimize safety and prevent or minimize risks to the extent possible.
	Prepare and adhere to AHAs that would define the steps to perform the work; assign risk assessment codes to each step; and identify the Competent Person(s) required for specific tasks.
	Prior to performing particularly hazardous tasks or operations, coordinate with on- or off-post fire and emergency services or other relevant organizations to identify and prevent or minimize potential risks.
	Conduct decommissioning activities in a controlled manner to minimize and keep radiological exposures ALARA in accordance with EM 385-1-80, <i>Radiation Protection</i> .
	Implement a Radiation Safety Program and Radiation Protection Plan that would require the use of applicable PPE and establish limits and monitoring for worker exposure to radiation in accordance with EM 385-1-1.
	Conduct environmental monitoring throughout the Proposed Action Alternative to ensure controls are adequate to protect human health and the environment.
Enter into one or more MOAs with on- and/or off-post fire and emergency response services and/or emergency health care providers to minimize fire risk and ensure safety, define roles and responsibilities, and establish conditions for response, oversight, and monitoring.	

Notes:

ADEC = Alaska Department of Environmental Conservation
 AHA = All Hazards Assessment
 ALARA = as low as reasonably achievable
 APP = Accident Prevention Plan
 BMP = best management practice
 C&D = construction and demolition
 CFR = Code of Federal Regulations
 CGP = Construction General Permit
 EA = Environmental Assessment
 EM = Engineer Manual
 FSS = Final Status Survey
 ICRMP = Integrated Cultural Resources Management Plan
 IMDG = International Maritime Dangerous Goods

INRMP = Integrated Natural Resources Management Plan
 MBTA = Migratory Bird Treaty Act
 MOA = memorandum of agreement
 NRC = Nuclear Regulatory Commission
 PPE = personal protective equipment
 RCRA = Resource Conservation and Recovery Act
 SHPO = State Historic Preservation Office
 SPCC = Spill Prevention, Control, and Countermeasure
 SWPPP = Stormwater Pollution Prevention Plan
 TSCA = Toxic Substances Control Act
 USACE = United States Army Corps of Engineers
 USAG = United States Army Garrison
 USDOT = United States Department of transportation
 USEPA = United States Environmental Protection Agency
 WTDP = Waste Transportation and Disposal Plan

ES.9 Public and Agency Involvement

USACE outreach regarding the Proposed Action is ongoing. The Draft EA will be available for a 30-day public review and comment period beginning February 26, 2021 and ending March 28, 2021. The availability of the Draft EA for public review will be announced in local and on-post newspapers as well as USACE social media platforms. Printed copies of the Draft EA will be made available for review or checkout at local libraries in accordance with applicable Coronavirus Disease 2019 (COVID-19) health mandates. Electronic copies of the Draft EA will be available for viewing or download from local public libraries, as applicable, and on the USACE project website (<https://www.nab.usace.army.mil/SM-1A/>). A list of individuals, agencies, organizations, Alaska Native tribal governments, and Alaska Native Claims Settlement Act (ANCSA) corporations that will be notified of the Draft EA's availability for public review is provided in the Draft EA.

Two in-person public meetings will be conducted in Fairbanks and Delta Junction during the 30-day Draft EA public review period. The meetings will be conducted in accordance with Centers for Disease Control and Prevention guidelines, health protection measures, and restrictions in effect at the time of the meetings. Public meetings will also be conducted in a virtual/online format in accordance with the *Interim Army Procedures for NEPA* dated June 15, 2020. To join the virtual public meeting, navigate a web browser to sm1a.consultation.ai and follow the instructions. The virtual meeting will be open the same dates as the comment period.

The 30-day Draft EA public review period will also provide the opportunity for public comment during the National Historic Preservation Act (NHPA) Section 106 process. The NHPA Section 106 process is being conducted in parallel with the NEPA process for the Proposed Action.

USACE is consulting with multiple regulatory agencies regarding the Proposed Action, including the Alaska Department of Environmental Conservation, Alaska Department of Fish and Game, Alaska Department of Natural Resources, Office of History and Archaeology (the Alaska State Historic Preservation Office [SHPO]), and U.S. Environmental Protection Agency (USEPA). In accordance with Department of Defense (DOD) Instruction 4710.02, *Interactions with Federally Recognized Tribes*, USACE is also coordinating with federally recognized Alaska Native tribes.

Substantive comments received during the NEPA process, including the 30-day Draft EA public review period, will be addressed in the Final EA.

ES.10 Environmental Consequences

The potential environmental consequences of the No Action Alternative and the Proposed Action Alternative are summarized in **Table ES-2**. Under either alternative, adverse impacts on resources analyzed in the Draft EA would be less-than-significant and would not meet the conditions requiring preparation of an EIS as defined in 32 CFR 651.41, *Conditions requiring an EIS*. Therefore, the Army has determined that the Proposed Action is not an action normally requiring preparation of an EIS as defined in 32 CFR 651.42, *Actions normally requiring an EIS*. The development and implementation of

formal mitigation measures would not be required because potential impacts from the Proposed Action Alternative would be less-than-significant.

The Army has determined, and the Alaska SHPO has concurred, that SM-1A is eligible for listing in the National Register of Historic Places (NRHP). The Proposed Action Alternative would have an *adverse effect* on historic properties under NHPA Section 106. In consultation with the Alaska SHPO and participating Section 106 consulting parties, USACE will execute a memorandum of agreement (MOA) with stipulations to resolve the adverse effect consistent with 36 CFR 800.6(c) and ensure that it remains less-than-significant.

Table ES-2: Summary of Impacts

Resource Area	No Action Alternative	Proposed Action Alternative
Cultural Resources (Draft EA Section 3.2)	No impacts. Existing conditions would continue.	Long-term, less-than-significant adverse effect on historic properties from the removal of SM-1A, which is eligible for listing in the NRHP. No effect on archaeological resources. NHPA Section 106 determination: <i>Adverse effect</i> on NRHP-eligible historic properties.
Water Resources (Draft EA Section 3.3)	No impacts. Existing conditions would continue.	Short-term, less-than-significant adverse impacts on water resources from temporarily increased sedimentation during ground-disturbing activities, and potential accidental spills. Stormwater would be managed in accordance with the CGP. Contact water from decommissioning activities would be managed in accordance with a site-specific liquid effluent monitoring plan. No long-term impacts on surface waterbodies or water quality. Beneficial long-term effects on stormwater management from restoration of the SM-1A site following removal of SM-1A facilities and infrastructure, and on groundwater from the decommissioning of 3 inactive wells associated with SM-1A.
Socioeconomics and Environmental Justice (Draft EA Section 3.4)	No impacts. Existing conditions would continue.	Short-term, beneficial effects on the local demography and economy from temporary decommissioning-related jobs, some of which may be local; and increased spending to purchase local goods and services during decommissioning activities. No short-term or long-term disproportionately adverse impacts on environmental justice communities or children. No long-term impacts.
Biological Resources (Draft EA Section 3.5)	No impacts. Existing conditions would continue.	Short-term, less-than-significant adverse impacts on vegetation from temporary disturbance; and on wildlife from temporary disturbance, displacement, or annoyance during decommissioning activities, and from an elevated risk of collisions with decommissioning-related traffic. No or negligible potential to affect marine biological resources. No long-term impacts.
Air Quality (Draft EA Section 3.6)	No impacts. Existing conditions would continue.	Short-term, less-than-significant adverse impacts on air quality from potential emissions of fugitive dust, and criteria pollutants from decommissioning-related vehicles and equipment. No long-term impacts.

Table ES-2: Summary of Impacts

Resource Area	No Action Alternative	Proposed Action Alternative
<p>Transportation and Traffic (Draft EA Section 3.7)</p>	<p>No impacts. Existing conditions would continue.</p>	<p>Short-term, less-than-significant adverse impacts on the on-post and off-post road network from increased decommissioning-related traffic, including heavy truck traffic and workers' commuting vehicles, that would have the potential to contribute to traffic congestion.</p> <p>Short-term, less-than-significant adverse impacts from the transportation of radioactive waste and non-radioactive regulated solid waste. All such waste would be packaged and transported in accordance with applicable regulatory requirements established by NRC, USDOT (including IMDG), USEPA, and the State of Alaska.</p> <p>Short-term, less-than-significant adverse impacts on marine ports and shipping. Waste container volumes would be minimal relative to the cargo volume routinely handled by the Port of Alaska and Port of Whittier. Radioactive waste containers would be shipped in accordance with USDOT regulations that limit radiation exposure to the public during transport.</p> <p>No short-term adverse impacts on the freight rail transportation network. Transport of waste containers by freight rail would be within the capacity of the ARRC.</p> <p>No long-term impacts.</p>
<p>Utilities (Draft EA Section 3.8)</p>	<p>No impacts. Existing conditions would continue.</p>	<p>Short-term, less-than-significant adverse impacts from pre-planned, temporary utility service outages or disruptions during the relocation of utility systems or components during decommissioning and dismantlement activities.</p> <p>No long-term impacts.</p>
<p>Soils (Draft EA Section 3.9)</p>	<p>Long-term, less-than-significant impacts. Low-level radioactive and non-radioactive contaminants associated with SM-1A would remain in soils on the site, and would continue to be monitored and managed as they currently are.</p>	<p>Short-term, less-than-significant adverse impacts from soil disturbance and excavation during decommissioning and dismantlement activities.</p> <p>Long-term, beneficial effects on soils from the removal of radiologically and non-radiologically contaminated soils.</p>
<p>Waste (Draft EA Section 3.10)</p>	<p>Long-term, less-than-significant adverse impacts from radioactive and non-radioactive regulated materials and waste associated with SM-1A. These materials and wastes would continue to be monitored and managed as they currently are.</p> <p>No impacts on non-hazardous solid waste.</p>	<p>Short-term, less-than-significant adverse impacts from the generation and management of radioactive and non-radioactive waste during decommissioning and dismantlement activities. Waste volumes would not exceed USACE's capacity to effectively manage and dispose of them.</p> <p>No long-term impacts from radioactive and non-radioactive waste.</p> <p>Long-term, beneficial effects from the removal and disposal of radioactive and non-radioactive waste from SM-1A and Fort Greely.</p>
<p>Safety and Health (Draft EA Section 3.11)</p>	<p>No impacts. Existing conditions would continue. Radiation monitoring would continue in accordance with the Reactor Possession Permit.</p>	<p>Short-term, less-than-significant adverse impacts from increased risk of worker exposure or injury during decommissioning and dismantlement activities.</p> <p>Long-term, beneficial effects on safety and health from the removal of radioactive waste and non-radioactive regulated solid waste from SM-1A.</p>

Table ES-2: Summary of Impacts

Resource Area	No Action Alternative	Proposed Action Alternative
Cumulative Effects (Draft EA Chapter 4)	No cumulative effects.	Less-than-significant adverse cumulative effects when considered with past, present, and reasonably foreseeable future projects in the ROI. Beneficial cumulative effects on safety and health.

Notes:

- ARRC = Alaska Railroad Corporation
- CGP = Construction General Permit
- EA = Environmental Assessment
- IMDG = International Maritime Dangerous Goods
- NHPA = National Historic Preservation Act
- NRC = Nuclear Regulatory Commission
- NRHP = National Register of Historic Places
- ROI = Region of Influence
- USACE = United States Army Corps of Engineers
- USEPA = United States Environmental Protection Agency
- USDOT = United States Department of Transportation

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LIST OF ACRONYMS AND ABBREVIATIONS

AAAQS	Alaska Ambient Air Quality Standards
AAC	Alaska Administrative Code
AADT	average annual daily traffic
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing material
ACP	access control point
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADOT&PF	Alaska Department of Transportation and Public Facilities
AEA	Atomic Energy Act
AHA	All Hazards Assessment
AHRS	Alaska Heritage Resources Survey
ALARA	As Low as Reasonably Achievable
ANCSA	Alaska Native Claims Settlement Act
ANSI	American National Standards Institute
APE	Area of Potential Effect
APP	Accident Prevention Plan
AR	Army Regulation
ARO	Army Reactor Office
ARP	Army Reactor Program
ARRC	Alaska Railroad Corporation
AS	Alaska Statute
bgs	below ground surface
BLM	Bureau of Land Management
BMP	best management practice
C&D	construction and demolition
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGP	Construction General Permit
CO	carbon monoxide
COVID-19	Coronavirus Disease 2019
CWA	Clean Water Act
DA PAM	Department of the Army Pamphlet
DECON	decontamination
DOD	Department of Defense
Doyon	Doyon Utilities, LLC
DP	Decommissioning Plan
DPW	Directorate of Public Works

EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	environmental justice
EM	Engineer Manual
ENTOMB	Entombment
EO	Executive Order
FHWA	Federal Highway Administration
FSS	Final Status Survey
GEIS	Generic Environmental Impact Statement
GHG	greenhouse gas
GTCC	Greater-Than-Class C
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HAP	hazardous air pollutant
HTD	hard to detect low-energy beta emitter
ICRMP	Integrated Cultural Resources Management Plan
ICRP	International Commission on Radiological Protection
IICEP	Intergovernmental and Interagency Coordination for Environmental Planning
IMDG	International Maritime Dangerous Goods
INRMP	Integrated Natural Resources Management Plan
LBP	Lead-based paint
LLRW	low-level radioactive waste
M&E	Materials and Equipment
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MBTA	Migratory Bird Treaty Act
MOA	memorandum of agreement
mrem	millirem
MSGP	Multi-Sector General Permit
MSW	municipal solid waste
NAAQS	National Ambient Air Quality Standards
NCRP	National Council on Radiation Protection
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO ₂	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NUREG	U.S. Nuclear Regulatory Commission Regulation

NWSR	National Wild and Scenic Rivers
NWSRS	National Wild and Scenic Rivers System
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyl
PEL	Planning and Environmental Linkage
PM2.5	particulate matter with an aerodynamic diameter of 2.5 microns or less
PM10	particulate matter with an aerodynamic diameter of 10 microns or less
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act
ROC	radionuclide of concern
ROI	region of influence
RPV	Reactor Pressure Vessel
SAFSTOR	Safe Storage
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Office
SM-1A	Stationary Medium Power Model 1A (Nuclear Power Plant)
SO2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure
SWPPP	Stormwater Pollution Prevention Plan
tpy	tons per year
TSCA	Toxic Substances Control Act
UFC	Unified Facilities Criteria
UP	Utility Privatization
U.S.	United States
USACE	United States Army Corps of Engineers
USAG	United States Army Garrison
USC	United States Code
USDA	United States Department of Agriculture
USDOE	United States Department of Energy
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VC	Vapor Container
WTDP	Waste Transportation and Disposal Plan

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1.0 Purpose and Need

1.1 Introduction

The United States Army Corps of Engineers (USACE), Baltimore District proposes to decommission and dismantle the deactivated Stationary Medium Power Model 1A Nuclear Power Plant (SM-1A) at United States (U.S.) Army Garrison Alaska Fort Greely (Fort Greely) and release the property for unrestricted use (Proposed Action). SM-1A was deactivated in 1972 and has been maintained in a safe storage (SAFSTOR) condition since that time. The decommissioning of a nuclear reactor is required within 60 years of permanent cessation of operations in accordance with U.S. Nuclear Regulatory Commission (NRC) regulation 10 Code of Federal Regulations (CFR) 50.82(a)(3) and Army Regulation (AR) 50-7, *Army Reactor Program* (17 November 2016), which establishes the Army's intent to follow NRC guidelines. Therefore, the decommissioning of SM-1A must be completed by 2032. In its current condition, SM-1A does not support the Army's mission in Alaska or at Fort Greely.

USACE has prepared this Environmental Assessment (EA) to analyze the Proposed Action's potential environmental impacts in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (Title 42, United States Code [USC] 4321 et seq.); the NEPA-implementing regulations of the Council on Environmental Quality (CEQ)³ (40 CFR 1500–1508) (1978, as amended in 1986 and 2005); and the Army's NEPA regulations (32 CFR 651, *Environmental Analysis of Army Actions*). USACE implements the decommissioning of deactivated Army nuclear power plants and ensures compliance with associated environmental and safety requirements in accordance with AR 50-7.

1.2 Background

1.2.1 SM-1A Location and Setting

SM-1A is on Fort Greely, which covers approximately 6,840 acres near Delta Junction, Alaska, approximately 100 miles southeast of Fairbanks (**Figure 1.2-1**). SM-1A occupies an approximately 1.5-acre fenced site in the central portion of Fort Greely along the north side of Arctic Avenue between First Street and East Fifth Street (**Figure 1.2-2**). The deactivated reactor and associated systems are primarily in a cylindrical structure known as the Vapor Container (VC) adjacent to Building 606 North. Building 606 North and Building 606 South also contain critical infrastructure associated with Fort Greely's existing utility systems. Building J-5 (also known as Building 607), immediately east of the VC, is used for storage by Fort Greely's utility privatization (UP) contractor (Doyon Utilities, LLC).

³ Substantive preparation of this EA began prior to updates to the CEQ regulations implementing NEPA that became effective on September 14, 2020. Therefore, this Draft EA has been prepared in accordance with the NEPA regulations that were previously in effect.

Figure 1.2-1: Fort Greely

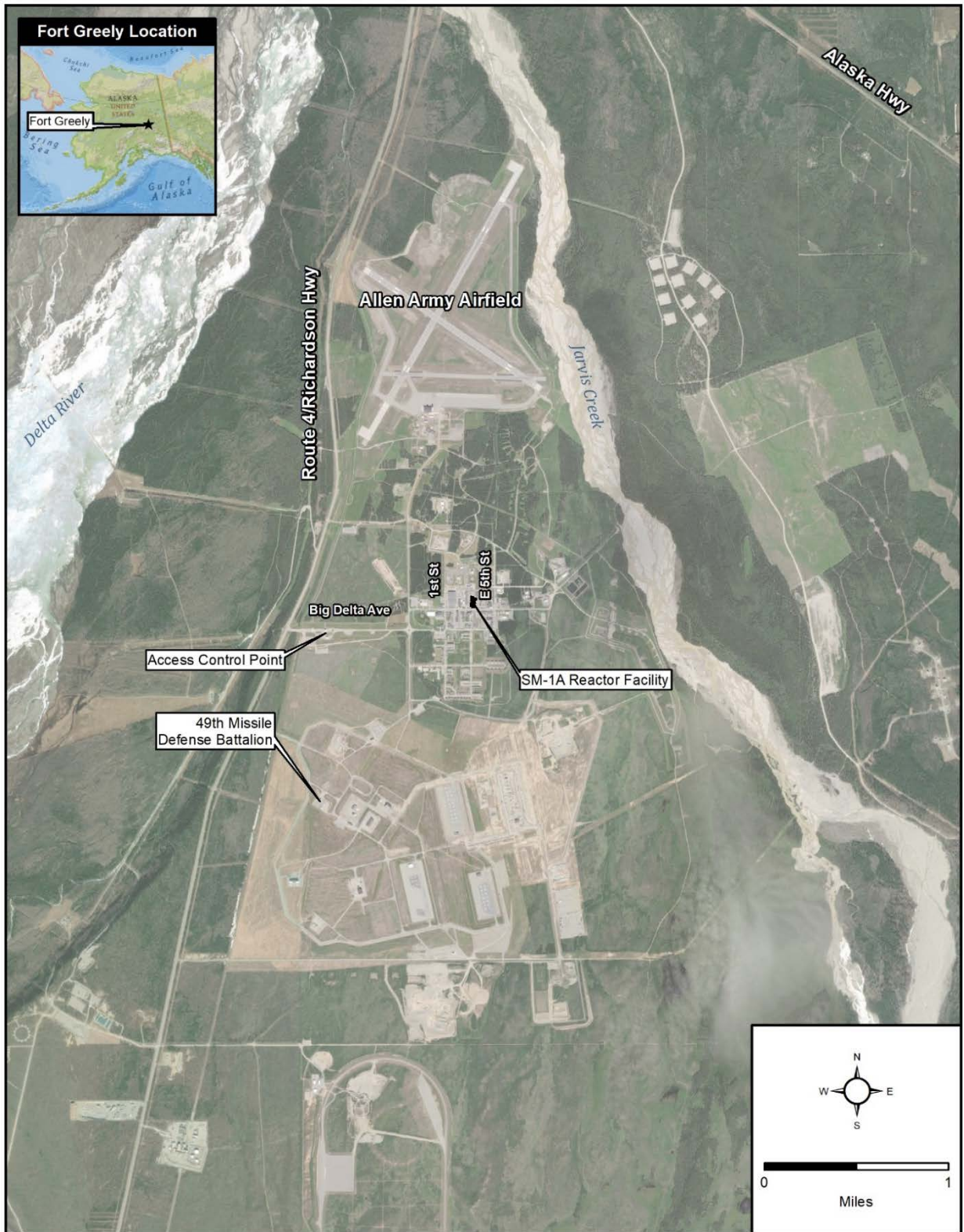
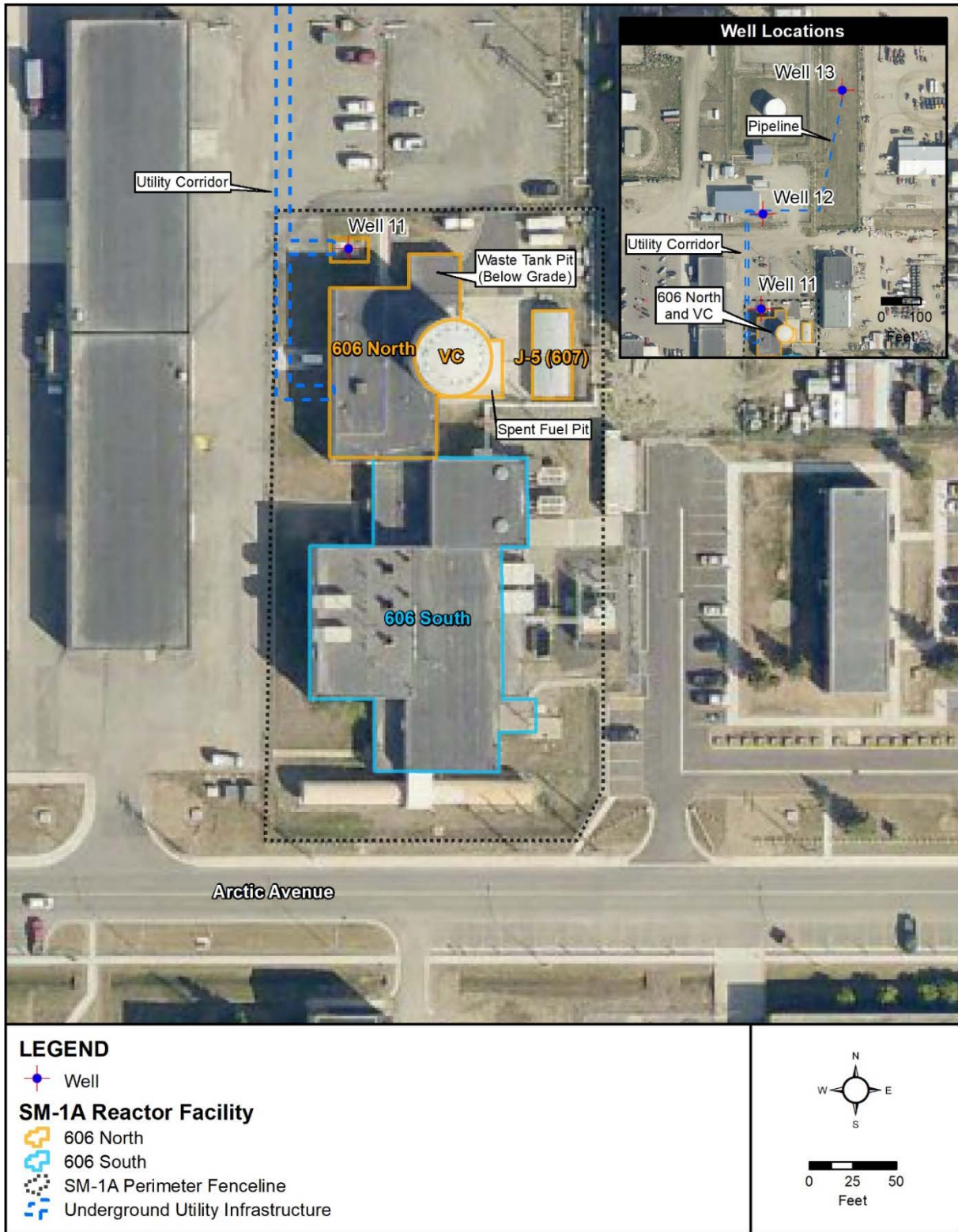


Figure 1.2-2: SM-1A



Facilities comprising SM-1A are summarized in **Table 1.2-1. Photos 1** through **6** show buildings and components associated with SM-1A and Fort Greely's utility systems.

Table 1.2-1: SM-1A Facilities

Facility No. or Name ¹	Facility Description	Building Footprint (square feet)	Total Building Square Footage
Building 606 North	Owned and occupied by the UP contractor. Contains office/storage space, electrical switchgear (Photo 1), battery charging stations, water softening systems, backup treated boiler water associated with Fort Greely's conventional utility systems; and the SM-1A reactor turbine (Photo 2). LLRW generated during SM-1A's 1973-1974 deactivation, including soils excavated from inside SM-1A's fenced perimeter, is sealed in the Demineralizer Room on the first floor adjacent to the VC. Ownership of the reactor components and associated radioactive materials and waste is maintained by the federal government.	4,760	9,120 (two stories)
Building 606 South	Owned and occupied by the UP contractor. Contains boilers, and the installation water supply and treatment area.	20,500	20,500
Building J-5 (also known as Building 607) (Photo 3)	Owned and occupied by the UP contractor. Formerly used as storage for radioactive materials and non-flammable chemicals when SM-1A was operational. Six inches of concrete were added to the building's floor during SM-1A's 1972-1973 deactivation. Currently used for UP contractor storage.	1,000	1,000
VC Structure	Cylindrical structure with a base diameter of 43 feet and an overall height of 63 feet (Photos 4 and 5). The base of the VC extends to 18.7 feet bgs. Contains the deactivated SM-1A reactor and associated equipment, including the RPV, primary shield tank, steam generator, pressurizer, and associated piping. Remaining reactor components are encased in concrete and an acrylamide grout-sand-soil mixture that is capped with 36 inches of reinforced concrete. Deactivated/not in use. Ownership of the reactor components and associated radioactive materials and waste is maintained by the federal government.	1,452	N/A
Supply Well No. 11 (Photo 6)	Supplied reactor cooling water when SM-1A was operational; deactivated/not in use. Ownership of the reactor components is maintained by the federal government.	N/A	N/A
Supply Well No. 12		N/A	N/A
Recharge Well No. 13 (also known as the "dry well")	Received treated reactor cooling water after 1968 when SM-1A was operational; deactivated/not in use. Ownership of the reactor components is maintained by the federal government.	N/A	N/A

Table 1.2-1: SM-1A Facilities

Facility No. or Name ¹	Facility Description	Building Footprint (square feet)	Total Building Square Footage
Spent fuel pit & waste tanks pit	Entirely filled with debris and an acrylamide grout-sand-soil mixture during SM-1A's 1972-1973 deactivation; deactivated/not in use. The base of the spent fuel pit extends to 13.5 feet bgs. Debris in these pits are assumed to be radiologically contaminated. Ownership of the reactor components and associated radioactive materials and waste is maintained by the federal government.	N/A	N/A
Pipe pit	Immediately north of the VC access hatch inside Building 606 North (below grade). Contains some radioactive materials and is entirely filled with concrete. Ownership of the reactor components and associated radioactive materials and waste is maintained by the federal government.	N/A	N/A

Notes:

¹The locations of SM-1A facilities are shown on **Figure 1.2-2**.

bgs = below ground surface

LLRW = low-level radioactive waste

N/A = not applicable

RPV = reactor pressure vessel

UP = utility privatization

VC = Vapor Container



Photo 1: Electrical switchgear in Building 606 North



Photo 2: Electrical generator (foreground, blue) and turbine (behind generator at right) associated with the original operation of SM-1A in Building 606 North



Photo 3: Building J-5 (also known as Building 607)



Photo 4: Exterior view of structure containing the SM-1A VC



Photo 5: VC access hatch inside Building 606 North



Photo 6: Well No. 11 Pump House

The area inside the SM-1A perimeter fence generally consists of paved asphalt or concrete with small areas of maintained lawn. Buildings 606 North, 606 South, and J-5 are owned by Fort Greely’s UP contractor. The UP contractor operates and maintains Fort Greely’s utility systems under the terms of a 50-year UP contract that was issued by the Defense Logistics Agency in 2007; these systems include the central heat and power plant, heat distribution system and utilidors, electrical distribution system, potable water treatment and distribution system, and wastewater distribution system and treatment plant. Most of the utility infrastructure in Building 606 North (**Table 1.2-1**) is original to the operation of SM-1A. Access to and conveyance of the utility systems and infrastructure facilities, including those in Building 606 North, is granted to the UP contractor by Army Easement DACA85-08-00124. The federal government maintains ownership of SM-1A reactor components and associated radioactive materials and waste.

The SM-1A site is accessed by vehicles and pedestrians through multiple locked gates in the perimeter fence. Access to unrestricted areas and equipment associated with SM-1A is controlled by the UP contractor. Access to restricted areas containing radioactive materials and waste is controlled by USACE. The Army owns the land underlying the facilities associated with SM-1A (**Table 1.2-1**).

1.2.2 SM-1A Operating and Decommissioning History

SM-1A was built between 1958 and 1962 and operated from 1962 to 1972 (**Figure 1.2-3**). It was a single-loop, 20.2 megawatt-thermal pressurized water reactor that used highly enriched uranium dioxide fuel to generate 2,000 kilowatts of electrical power and 37,850 pounds of extraction steam per hour. SM-1A's primary mission was to supply electrical power and heating steam for on-post buildings and facilities at Fort Greely; it was also used as an in-service test facility to understand how the equipment would function in an arctic environment.

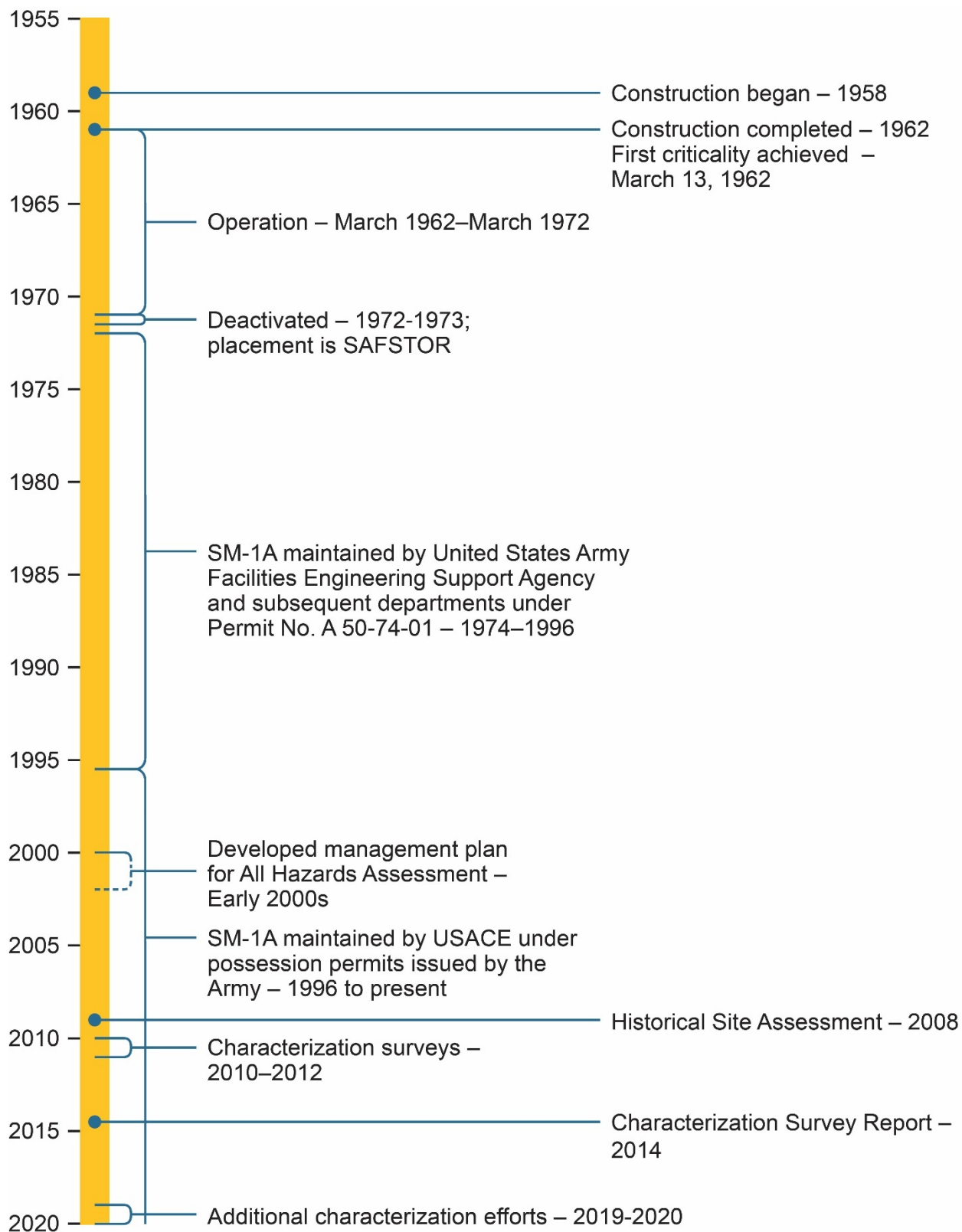
The SM-1A decommissioning process began following the reactor's final shutdown in March 1972. The initial deactivation of SM-1A consisted of placing the facility in a SAFSTOR configuration by removing the nuclear fuel, conducting minor decontamination, shipping some radioactive waste for disposal, sealing the VC, and installing appropriate warning signs and monitoring devices. Much of the reactor's primary system components were dismantled, and components inside the VC were encased in concrete and an acrylamide grout-sand-soil mixture. This mixture was capped with 36 inches of reinforced concrete to a finished elevation of about 10 feet above the bottom of the VC, and the VC hatch was sealed (**Photo 5**). Waste generated during the initial deactivation activities was placed in the spent fuel pit and waste tanks pit. These pits were then filled with an acrylamide grout-sand-soil mixture, and capped with reinforced concrete. Debris in these pits are assumed to be radiologically contaminated.

Following these deactivation activities, SM-1A was placed under a routine monitoring program, currently implemented by USACE. SM-1A has been maintained in SAFSTOR since 1972 to allow residual radioactivity to decay and minimize worker exposure to radiation to the extent possible during final decommissioning and dismantlement activities. Since its placement in SAFSTOR, SM-1A has been subject to regular inspection and monitoring by USACE in accordance with AR 50-7 and SM-1A Reactor Possession Permit Number SM1A-1-19, Amendment 1-20, issued by the U.S. Army Deputy Chief of Staff G-3/5/7 through the Army Reactor Office (ARO) (see additional discussion in **Section 1.2.3**). Generally, Building 606 North has remained occupied by government personnel and/or contractors operating Fort Greely's conventional steam and power plant since SM-1A's deactivation in 1972.

Prior to completing the decommissioning of a deactivated nuclear reactor, AR 50-7 requires the preparation of a four-phase All Hazards Assessment (AHA) to outline the planning and decommissioning approach. The planning, sampling, and analytical requirements of the AHA are integral parts of the decommissioning process that ensure proper waste classification, handling, treatment, disposal, and/or storage.

USACE began developing a management plan in the early 2000s for conducting the SM-1A AHA. Phase I of the AHA, a Historical Site Assessment, was completed in 2008, and Phase II characterization surveys were conducted at the SM-1A site from 2010 to 2012. The survey results were documented in a 2014 Characterization Survey Report, thereby completing Phase II of the AHA. Additional characterization efforts were performed in 2019 and 2020 to validate the Characterization Survey Report findings and address identified data gaps.

Figure 1.2-3: SM-1A Historical Timeline from 1958 to 2020



Currently, the proposed decommissioning of SM-1A is in Phase III of the AHA process. Phase III includes the development of a detailed Decommissioning Plan (DP) and associated documentation to execute the selected hazards reduction approach, decommissioning, and disposal options. Upon ARO approval of the DP, the U.S. Army Deputy Chief of Staff G-3/5/7 would issue the SM-1A decommissioning permit to USACE. Phase IV would consist of implementing the ARO-approved DP, completing the proposed decommissioning and dismantlement, and terminating the U.S. Army-issued SM-1A decommissioning permit.

1.2.3 Army Reactor Program and Regulatory Authority

USACE maintains SM-1A in accordance with AR 50-7 and Reactor Possession Permit No. SM1A-1-19, Amendment 1-20, issued through the ARO. The ARO, established by the U.S. Army, oversees the Army Reactor Program (ARP) and designates the ARP Manager. USACE implements the decommissioning of deactivated Army nuclear power plants and ensures compliance with associated environmental and safety requirements in accordance with AR 50-7.

SM-1A was designed, constructed, and operated as part of the Army Nuclear Power Program (the present-day ARP). The program was established in the 1950s to develop, construct, and operate small nuclear power reactors on select Department of Defense (DOD) lands under authority granted to the DOD by Section 91(b) of the Atomic Energy Act (AEA) of 1954, as amended (42 USC 2011 et seq.). AEA Section 91(b) authorizes DOD to procure and use special nuclear material in the interest of national defense and to acquire utilization facilities (e.g., nuclear reactors) for military purposes. AEA Section 110(b) excludes such utilization facilities acquired by DOD from the licensing requirements specified therein.

The AEA provides the Army with the authority to establish the ARO and administer the ARP. AR 50-7 implements this authority and sets forth program policies consistent with NRC regulations, including decommissioning criteria set forth in 10 CFR 20 Subpart E, *Radiological Criteria for License Termination*. Today, the ARP helps ensure that Army reactors are decommissioned in a manner that is consistent with federal regulatory standards and guidelines, including those put forth by NRC, National Council on Radiation Protection (NCRP), and American National Standards Institute (ANSI). It is Army policy to implement decommissioning projects consistent with NRC guidelines as well as the recommendations of NCRP and ANSI.

Decommissioning activities under ARO's purview are also subject to AR 385-10, *The Army Safety Program* (29 November 2000); and Department of the Army Pamphlet (DA PAM) 385-24, *The Army Radiation Safety Program* (30 November 2015), which outlines radiation safety regulations and protocols applicable to the decommissioning of Army reactor facilities. The ARP adopts the NRC's radiological dose criteria for releasing a facility or site for unrestricted use, as provided in 10 CFR 20.1402, *Radiological criteria for unrestricted use*. This regulation states that a facility or site can be released for unrestricted use if radioactivity levels are such that the average member of a critical

group⁴ would not receive a total effective dose equivalent in excess of 25 millirem (mrem) per year above background levels. Regulations in 10 CFR 20, *Standards for Protection Against Radiation* also stipulate that residual activity be reduced to levels that are as low as reasonably achievable (ALARA) (radiological safety and health is discussed in **Section 3.11**).

1.3 Purpose and Need

The **purpose** of the Proposed Action is to safely remove, transport, and dispose of all materials and equipment (M&E), structures, and residual contamination associated with SM-1A; release the SM-1A site for unrestricted use in accordance with radiological dose criteria established by the NRC in 10 CFR 20.1402 and adopted by the Army; and terminate the U.S. Army-issued SM-1A decommissioning permit. The **need** for the Proposed Action is to complete the decommissioning of SM-1A within 60 years (by 2032) of permanent cessation of operations in accordance with NRC regulation 10 CFR 50.82(a)(3) and AR 50-7, *Army Reactor Program* (17 November 2016), which establishes the Army's intent to follow NRC guidelines.

SM-1A has been maintained in a SAFSTOR condition and subject to regular inspection and monitoring for more than 48 years. In its current condition, SM-1A does not support the Army's mission on Fort Greely, now or in the future. The Proposed Action would enable USACE to meet Army mission objectives to decommission SM-1A, terminate the SM-1A decommissioning permit, and release the underlying land for unrestricted use.

1.4 National Environmental Policy Act Process

NEPA provides a process for the consideration of environmental issues in federal agency planning and decision-making. Under NEPA, federal agencies must prepare an EA for any federal action, except those actions that are determined to be "categorically excluded." An EA is a concise public document that serves to provide sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS). The EA includes brief discussions of the following:

- The purpose of and need for the proposal
- Alternatives to the proposal (as required under Section 102 [2][E] of NEPA)
- The environmental impacts of the proposed action and alternatives
- A listing of agencies and persons consulted

Army regulations governing NEPA compliance are provided in 32 CFR 651. Every EA must lead to either a Finding of No Significant Impact (FNSI) or a decision to prepare an EIS (32 CFR 651.20[a]). Should the Army determine that the Proposed Action would have a significant impact on the quality of the human and natural environment, an EIS would be prepared.

⁴ A critical group is defined in NRC regulations (10 CFR 20.1003, *Definitions*) as the group of individuals reasonably expected to receive the greatest exposure to residual radioactivity for any applicable set of circumstances.

1.5 Scope of the Environmental Assessment

This Draft EA analyzes the Proposed Action's potential adverse, beneficial, and cumulative effects on the human and natural environment at and in the vicinity of SM-1A and Fort Greely. Alternatives for implementing the Proposed Action and USACE's alternatives screening criteria are discussed in **Chapter 2**. Potential impacts from the No Action Alternative are also analyzed in this Draft EA in accordance with CEQ NEPA regulations in 40 CFR 1502.14, *Alternatives Including the Proposed Action*.

The Proposed Action's potential effects are analyzed in this Draft EA for the following resources: cultural resources, water resources, socioeconomics and environmental justice, biological resources, air quality, transportation and traffic, utilities, soils, waste, and safety and health. **Chapter 3** presents information on the existing condition of each resource area in its appropriate analysis area, or region of influence (ROI); the environmental impact analysis; and recommended best management practices (BMPs). **Section 3.1** discusses the resource areas that were dismissed from further analysis in this Draft EA: airspace, land use, noise, recreation, seismology, geology and topography, and visual resources. Cumulative effects are discussed in **Chapter 4**.

1.6 Decision to be Made

The intent of this Draft EA is to inform decision makers and the public of the potential environmental effects from the Proposed Action and its alternatives prior to making a federal decision to implement an alternative. In doing so, the Army can make a fully informed decision, aware of the Proposed Action's potential environmental effects. This decision-making process also includes identifying measures that USACE would commit to undertake to minimize potential environmental effects, as required by NEPA, CEQ regulations, and Army NEPA regulations.

The decision to be made is whether the Army should implement the Proposed Action and, if necessary, incorporate measures to minimize potential adverse effects and enhance beneficial effects on resources, as applicable.

1.7 Public and Agency Involvement

USACE invites public participation in its decision-making process in accordance with NEPA. The following sections summarize public and agency involvement regarding to the Proposed Action that is planned or has been conducted to date.

1.7.1 Public Involvement

USACE outreach regarding the Proposed Action is ongoing. This Draft EA will be available for a 30-day public review and comment period beginning February 26, 2021 and ending March 28, 2021. A Notice of Availability for the public release of the Draft EA will be published in the *Delta Wind*, *Fairbanks Daily News Miner*, *Anchorage Daily News*, and the *Alaska Post* (Fort Greely's on-post newspaper). Availability of the Draft EA will also be announced on USACE social medial platforms. The 30-day Draft EA public review period will provide interested parties with the opportunity to comment on the National Historic Preservation Act (NHPA) Section 106 process, which is being conducted concurrently with the NEPA process for the Proposed Action. Individuals, agencies,

organizations, Alaska Native tribal governments, and Alaska Native Claims Settlement Act (ANCSA) corporations that will be notified of the Draft EA's availability for public review are listed in **Section 8.0**.

State and/or local Coronavirus Disease 2019 (COVID-19) health mandates permitting, printed copies of this Draft EA will be made available for public review or checkout, at the Delta Community Library in Delta Junction, the Fort Wainwright Library in Fort Wainwright, the Noel Wien Public Library in Fairbanks, and the Z. J. Loussac Public Library in Anchorage. Electronic copies of the Draft EA will also be available for viewing and download from the Z. J. Loussac Public Library, the Noel Wien Public Library, and on the USACE project website (<https://www.nab.usace.army.mil/SM-1A/>).

To provide interested parties and local communities with additional opportunities to learn about and comment on the Proposed Action and Draft EA, USACE will hold in-person public meetings during the 30-day Draft EA public comment period at the Westmark Fairbanks Hotel and Conference Center on March 9, 2021 and the Delta Junction Community Center on March 11, 2021. Both meetings will be held from 5:00 p.m. to 9:00 p.m. and will include an open house/poster session and formal presentation by USACE personnel. In consideration of the COVID-19 public health emergency, these meetings will be conducted in a manner consistent with applicable Centers for Disease Control and Prevention guidelines, health protection measures, and restrictions in effect at the time of the meetings. Public meetings will also be conducted in a virtual/online format in accordance with the *Interim Army Procedures for NEPA* dated June 15, 2020. To join the virtual public meeting, navigate a web browser to sm1a.consultation.ai and follow the instructions. The virtual meeting will be open the same dates as the comment period.

Substantive comments received during the Draft EA public review period will be addressed in the Final EA. Additional information about the proposed SM-1A decommissioning is available on the project website.

Table 1.7-1 summarizes additional USACE outreach conducted to date for the Proposed Action. The events and venues were selected to provide multiple on- and off-post opportunities to obtain information about the proposed decommissioning of SM-1A. Participants at each event were encouraged to ask questions and provide comments about the Proposed Action. Additionally, USACE conducted several stakeholder, partner, and public engagements from August 6-8, 2019. During this time, USACE coordinated with project partners, including Fort Greely, USACE Alaska District, and the UP contractor to ensure continued regional expertise and transparency for the proposed decommissioning.

Table 1.7-1: Public Outreach Conducted to Date for the Proposed Action

Event	Date	Location
Restoration Advisory Board Meeting	April 25, 2018	Fort Greely, AK
Alaska Forum for the Environment	February 12-15, 2019	Anchorage, AK
On-post Community Meeting	April 23, 2019	Fort Greely, AK
Off-post Community Meeting	April 24, 2019	Delta Junction, AK
Delta Junction City Council Meeting	August 6, 2019	Delta Junction, AK
Pre-Technical Project Planning Meeting with Federal, State, and Local Regulatory Officials	June 11-12, 2020	Teleconference / Online
Delta Junction City Council Meeting	September 20, 2020	Delta Junction, AK
Tribal Stakeholder Meeting	September 21, 2020	Fairbanks, AK / Teleconference / Online
Technical Project Planning Meeting with Federal, State, and Local Regulatory Officials	January 28-29, 2021	Fairbanks, AK / Teleconference / Online

1.7.2 Intergovernmental and Interagency Coordination for Environmental Planning

Intergovernmental and Interagency Coordination for Environmental Planning (IICEP) is a federally mandated process for informing and coordinating with other government agencies regarding a federal proposed action. USACE is coordinating and consulting with the following agencies during the IICEP process for this EA:

- Alaska Department of Environmental Conservation (ADEC)
- Alaska Department of Fish and Game (ADF&G)
- Alaska Department of Natural Resources, Office of History and Archaeology (State Historic Preservation Office [SHPO])
- U.S. Environmental Protection Agency (USEPA)

Copies of correspondence relevant to the IICEP process are included in **Appendix A** of this Draft EA.

1.7.3 Tribal Consultation

USACE is consulting with federally recognized Alaska Native tribes during this NEPA process in accordance with DOD Instruction 4710.02, *Interactions with Federally Recognized Tribes*. This instruction implements tribal consultation in accordance with DOD's American Indian and Alaska Native Policy (updated January 2012); AR 200-1, *Environmental Protection and Enhancement*; NEPA; NHPA; and Native American Graves and Protection and Repatriation Act. Tribes have been invited to participate in the NEPA process as Sovereign Nations per Executive Order (EO) 13175, *Consultation and Coordination with Indian Tribal Governments* (6 November 2000), as reiterated by Presidential Memorandum, *Tribal Consultation* dated 5 November 2009. Copies of correspondence relevant to the Tribal consultation process are included in **Appendix A** of this Draft EA.

1.8 Relevant Documents

1.8.1 Programmatic NEPA Review

Pursuant to NEPA, the NRC has completed three program-level NEPA documents that evaluate the potential environmental effects from decommissioning nuclear reactor facilities and associated activities. The scope of these documents, and their relevant conclusions that are applicable to the analysis presented in this Draft EA, are summarized as follows:

- *Generic Environmental Impact Statement (GEIS) on Decommissioning of Nuclear Facilities, Supplement 1 (U.S. Nuclear Regulatory Commission Regulation [NUREG]-0586) (NRC 2002)*. This GEIS analyzes decommissioning activities performed to remove radioactive and non-radioactive (e.g., intake structures and cooling towers) materials from structures, systems, and components from license certification to termination. The GEIS determined that most potential environmental impacts from the decommissioning of nuclear facilities are small.
- *GEIS in Support of Rulemaking on Radiological Criteria for License Termination of NRC-Licensed Nuclear Facilities (NUREG-1496) (NRC 1997)*. This GEIS analyzes regulatory alternatives for establishing radiological criteria for decommissioning licensed nuclear facilities. The GEIS concludes that decommissioning alternatives should consider the future use of the site, provisions for public participation, the minimization of radioactive waste volumes and overall public risk, and other factors.
- *Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes (NUREG-0170) (NRC 1977)*. This Final Environmental Statement analyzes impacts on human health and safety (under normal and accident conditions) from the transport of radioactive material, packaged in accordance with applicable regulatory requirements. The Final Environmental Statement determined that risks to workers and the general public from exposure to radioactive material during transport are low.

This Draft EA incorporates relevant analyses and conclusions from the NEPA documents listed above, as applicable.

1.8.2 Decommissioning Planning Documents and Studies

Relevant information from the following SM-1A decommissioning planning documents is incorporated in this Draft EA, as applicable:

- Decommissioning Environmental Assessment (U.S. Army 1971)
- Historical Site Assessment (USACE 2008)
- Characterization Survey Report (USACE 2014)
- Decommissioning Plan (USACE 2020a)
- Waste Management and Disposal Plan (USACE 2020b)

1.8.3 Previous NEPA Documentation for the Disposal of Radioactive Waste and Non-Radioactive Regulated Solid Waste in the Contiguous 48 States

The previously prepared NEPA documents listed below evaluate the disposal of radioactive waste and/or non-radioactive regulated solid waste at federally and privately operated facilities in the contiguous 48 states:

- *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste (DOE/EIS-0200)* (USDOE 1997)
- *Environmental Assessment for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste at Waste Control Specialists, Andrews County, Texas (DOE/EA-2082)* (USDOE 2018)
- *Final Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste (DOE/EIS-0375)* (USDOE 2016)
- *Final Site-Wide Environmental Impact Statement (EIS) for the Nevada National Security Site and Off-Site Locations in Nevada (DOE/EIS-0426)* (USDOE 2013)
- *Final Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement, Richland, Washington (DOE/EIS-0286F)* (USDOE 2004)

The documents listed above were prepared separately from this Draft EA. This list is not intended to be comprehensive. Other NEPA documents evaluating the disposal of radioactive waste and non-radioactive regulated solid waste in the contiguous 48 states may be available.

1.8.4 Other Relevant Documents

Information relevant to the Proposed Action analyzed in this Draft EA was obtained from multiple sources. This information is cited or summarized throughout the document, as appropriate. A complete list of references is provided in **Chapter 6**.

1.9 Regulatory Framework

This Draft EA has been prepared in accordance with NEPA, CEQ regulations, and Army NEPA regulations (**Section 1.1**). Other laws and regulations applicable to the Proposed Action include, but are not limited to, the following:

- Atomic Energy Act (AEA) (42 USC 2011 et seq.)
- Clean Water Act (CWA) (33 USC 1251 et seq.)
- Resource Conservation and Recovery Act (RCRA) of 1976 (42 USC 6901 et seq.)
- Section 438 of the Energy Independence and Security Act (Public Law 110-140)
- Federal Clean Air Act (CAA) of 1990 (42 USC 7401 et seq., as amended)
- Endangered Species Act (16 USC 1531 et seq.)
- Migratory Bird Treaty Act (MBTA) (16 USC 703 et seq.)
- NHPA (16 USC 470 et seq., 54 USC 300101 et seq.)

- Native American Graves and Protection and Repatriation Act (25 USC 3001 et seq.)
- Toxic Substances Control Act (TSCA) of 1976 (15 USC 2601 et seq.)
- Transportation Safety Act of 1974 (Public Law 93-633)
- Hazardous Material Transportation Act (49 USC 5101 et seq.)
- Energy Reorganization Act of 1974
- EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (1994)
- EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (21 April 1997), as amended by EO 13296 (2003)
- EO 13834, *Efficient Federal Operations* (2018)

2.0 Description of Proposed Action and Alternatives

2.1 Introduction

This section describes the Army's Proposed Action to decommission SM-1A. Alternatives retained for analysis in this Draft EA, alternatives that USACE considered but dismissed from detailed EA analysis, and USACE's alternatives screening criteria are also discussed.

2.2 Description of the Proposed Action

Under the Proposed Action, USACE would: 1) complete the decommissioning and dismantlement of SM-1A in accordance with the ARO-approved DP; 2) terminate the U.S. Army-issued SM-1A decommissioning permit; and 3) release the SM-1A site for unrestricted use in accordance with NRC regulations in 10 CFR 20.1402 and adopted by the Army. Implementation of the Proposed Action would occur over approximately 6 years, beginning in 2022 and ending in 2028.

The Proposed Action would be implemented primarily in a 1.5-acre area that includes Building 606 North, the VC, Building J-5, and an approximately 18,000-square-foot (0.4-acre) gravel parking area immediately north of Building 606 North (**Figure 1.2-1**). The parking area would primarily be used for laydown of decommissioning-related materials, and staging for packaged (i.e., containerized) waste prior to transport from the site. Vehicular traffic associated with the Proposed Action would use existing on-post and off-post roads to access the SM-1A site throughout the 6-year implementation period.

This section summarizes key elements of the Proposed Action; additional information is provided in **Chapter 3**, as applicable. The major phases of the Proposed Action are summarized in **Table 2.2-1**. These phases are listed in the probable sequence that they would occur. However, some variability in this sequence is anticipated due to scheduling considerations, construction seasons, permitting, and the availability of personnel and specialized equipment.

The Proposed Action would require the complete dismantlement of Building 606 North, the VC, and Building J-5 to remove components of SM-1A in those buildings. Building materials and underlying soils impacted by residual contamination associated with the reactor's operation would also be removed. Removal of these buildings, materials, and soils would support release of the site in accordance with unrestricted use criteria in 10 CFR 20.1402.

Building 606 is owned and used by the installation's UP contractor. UP contractor operations must relocate to Building 606 South for the duration of the Proposed Action. Discussions between the UP contractor, DLA, Fort Greely, and USACE are ongoing, and it is believed that the Proposed Action is implementable with the full support of the UP contractor.

To replace UP contractor administrative and storage space that would be lost due to the proposed dismantlement of Building 606 North, an approximately 1,500-square-foot temporary facility may be erected adjacent to the southwestern side of Building 606 South. This temporary facility may consist of modular office and storage units (similar to

steel shipping containers) that could be stacked up to two stories high to provide the necessary space, and covered to accommodate weather. An approximately 1,000-square-foot permanent addition may also be built on the southeast corner of Building 606 to provide additional storage, office, and work space. Relocation of UP contractor operations to the southern portion of Building 606 must occur prior to the implementation of decommissioning activities as described under Phase 1 (**Table 2.2-1**). The southern portion of Building 606 would be physically isolated from the north end for the duration of the Proposed Action. Following decommissioning, the UP contractor may rebuild in-kind administrative and storage facilities on the footprint of the existing Building 606 North.

Table 2.2-1: Proposed Action Summary

Proposed Action Phase	Description
<p>1. Mobilization and Site Preparation; Establishment of Exterior Controlled Area Boundary and Radiological Control Points</p>	<p>Activities in this phase would include:</p> <ul style="list-style-type: none"> • Establishing an approximately 1,500-square-foot temporary work facility and 1,000-square-foot permanent addition to the southwest and southeast sides of Building 606 South, respectively, and relocating UP contractor operations (including personnel, materials, and equipment) to those areas and Building 606 South from Building 606 North • Relocating overhead power lines and aboveground fuel lines, as necessary, prior to heavy equipment mobilization • Removing existing areas of vegetation on the SM-1A site, consisting of small areas of grass and two trees near the southwest corner of the building • Installing new fencing to separate the project area from Building 606 South (the fencing would include vehicle and pedestrian access control points, and could be extended farther to the north to enclose additional laydown areas or waste storage locations) • Establishing radiological and security controls • Establishing temporary or modified facilities and work support areas • Establishing temporary waste staging area • Disconnecting existing electrical power service to Buildings 606 North and J-5, and installing temporary power connections to those buildings • Upgrading or reconfiguring the site's existing perimeter security fence and access control points, as necessary • Mobilization of personnel and equipment to the SM-1A site
<p>2. Building J-5 Disposition</p>	<p>Building J-5 would be demolished early in the project to provide additional operating space on the east side of the SM-1A site. Dismantlement would include removal of non-radioactive M&E and the aboveground structure so the area could be used for additional workspace for the dismantlement of Building 606 North, the VC, and associated structures. The concrete floor slab and any underlying soils impacted by radioactive or non-radioactive constituents would be removed later in the Proposed Action to meet unrestricted use standards. FSSs would be conducted as necessary to ensure that excavated areas and remaining soils meet unrestricted release criteria, and the disturbed area would be subsequently backfilled with clean fill soils meeting applicable Fort Greely requirements.</p>

Table 2.2-1: Proposed Action Summary

Proposed Action Phase	Description
<p>3. Building 606 North Disposition</p>	<p>As necessary, radiological release surveys and abatement of non-radioactive regulated materials would be conducted in Buildings 606 North (Table 1.2-1). Non-radioactive regulated materials at SM-1A may include:</p> <ul style="list-style-type: none"> • LBP; • ACM; • PCBs in paints, oils, and other materials; and • Other non-radioactive regulated materials, such as lead pipes and solder, fluorescent tubes and bulbs, and mercury switches and thermostats. <p>Non-radioactive regulated materials would be removed from unrestricted areas of Building 606 North first. Unrestricted areas are those areas outside the VC, spent fuel pit, waste tanks pit, and the Demineralizer Room. This would be followed by removal of M&E and radiologically contaminated regulated materials from the Demineralizer Room, spent fuel pit, VC, and waste tanks pit. Aboveground and underground structures and equipment comprising these areas would also be dismantled.</p> <p>Due to the harsh weather conditions at Fort Greely, portions of Building 606 North would be used for project support activities, material storage, waste decontamination, or controlled access to radiologically contaminated areas as long as reasonably possible. After indoor areas are no longer needed, radiologically contaminated materials and non-radioactive regulated materials are removed, and painted surfaces are decontaminated to address PCB and lead paints, Building 606 North would be demolished. FSSs of the walls, ceilings, floors, structural members, remaining M&E, and other remaining components would be performed as necessary to allow for the unrestricted release of building materials prior to demolition. The dismantlement of Building 606 North would include the removal of subsurface components such as foundation slabs, footings, and underlying and/or adjacent soils.</p> <p>Radioactive waste and non-radioactive regulated solid waste would be managed in accordance with applicable requirements established, respectively, by NRC and USEPA through its enforcement of RCRA and TSCA. These wastes would be packaged (i.e., containerized) in accordance with applicable regulatory requirements established by NRC, USDOT (including IMDG), and USEPA, and transported by trained and qualified contractors for disposal at permitted facilities in the contiguous 48 states (there are no permitted disposal facilities in Alaska for radioactive waste or most non-radioactive regulated solid wastes). Waste transportation is discussed in Section 3.7. Wastes that would be generated by the Proposed Action are discussed in Section 3.10.</p>
<p>4. Other Exterior System Removals, Remediation, and Final Status Surveys</p>	<p>Supply Well No. 11, Supply Well No. 12, and Recharge Well No. 13 would be abandoned in place and sealed in accordance with ADEC drinking water regulations set forth in 18 AAC 80.015(e) after associated pumps, pipes, and concrete structures are removed, characterized, and disposed of according to state and federal regulations. An approximately 400-foot-long concrete utilidor connecting Building 606 North with Wells No. 11 and 12 (Figure 1.2-2), and an approximately 450-foot pipe from the north end of the utilidor to Well No. 13 would be excavated and removed. The utilidor is approximately 3 feet bgs while the pipe to Well No. 13 is 4 to 5.5 feet bgs. An approximately 40-foot-long remnant pipe segment (from the waste tanks pit to the perimeter fence) associated with SM-1A's original liquid radioactive waste discharge system, which was deactivated in 1968, would also be excavated and removed. This remnant segment is less than 6 feet bgs. All excavations would be backfilled with clean fill soils meeting applicable Fort Greely requirements. FSSs would be conducted at excavated areas as necessary to ensure radioactivity levels meet applicable unrestricted use criteria.</p>
<p>5. Site Restoration</p>	<p>FSSs would be conducted as necessary to ensure that excavated areas and remaining soils meet unrestricted release criteria. FSS results would be confirmed by an independent verification contractor. Excavated areas would then be backfilled with clean fill soils meeting applicable Fort Greely requirements, and graded and compacted to achieve positive drainage. The site would be seeded with native grasses to prevent soil erosion. Future use or redevelopment of the site would be at</p>

Table 2.2-1: Proposed Action Summary

Proposed Action Phase	Description
	the discretion of Fort Greely and the UP contractor. NEPA documentation would be prepared separately from this Draft EA as applicable for future use or redevelopment of the site.
6. Demobilization	Temporary structures or infrastructure components used to support the prior phases of the Proposed Action would be dismantled and removed from the site. Historical markers or displays describing SM-1A may be installed during this phase in accordance with the outcome of the NHPA Section 106 consultation process (Section 106 consultation is discussed in Section 3.2). Following demobilization, no remnants of SM-1A would remain on the site.

Notes:

- | | |
|---|--|
| <p>AAC = Alaska Administrative Code
 ACM = asbestos-containing material
 ADEC = Alaska Department of Environmental Conservation
 bgs = below ground surface
 EA = Environmental Assessment
 FSS = Final Status Survey
 IMDG = International Maritime Dangerous Goods
 LBP = lead-based paint
 M&E = materials and equipment
 NEPA = National Environmental Policy Act</p> | <p>NHPA = National Historic Preservation Act
 NRC = Nuclear Regulatory Commission
 PCB = polychlorinated biphenyl
 RCRA = Resource Conservation and Recovery Act
 TSCA = Toxic Substances Control Act
 UP = utility privatization
 USDOT = United States Department of Transportation
 USEPA = United States Environmental Protection Agency
 VC = Vapor Container</p> |
|---|--|

The Proposed Action would require substantial excavation of the SM-1A site in areas underlying and adjacent to Buildings 606 North and J-5 to remove contaminated soils and subsurface components (e.g., foundation slabs, footings, and pipes). The Proposed Action would also generate radioactive waste, non-radioactive regulated solid waste, and non-hazardous solid waste. Estimated volumes of waste (including soil excavation), and the number of trucks or containers required to transport waste from the SM-1A site for disposal, are summarized in **Table 2.2-2**.

Table 2.2-2: Estimated Waste Volumes and Trucks/Containers Required for Shipment

Waste Type	Estimated Waste Volume (cubic yards)	Estimated Number of Trucks or Containers
C&D waste ¹	3,032	255
Radioactive Waste	2,969	250 ²
Non-Radioactive Regulated Solid Waste	49	
TOTAL	6,050	505
Excavated Soils ²	1,681	119

Note:

- ¹ C&D waste typically consists of inert materials such as lumber, metal, roofing, bricks, drywall, insulation, and concrete (U.S. Army 2017).
- ² Already included in the estimated radioactive waste volume and corresponding number of trucks/containers but listed separately to provide additional detail. It is anticipated that most excavated soils would require disposal as radioactive waste and/or non-radioactive regulated material at permitted facilities in the contiguous 48 states.
- C&D = construction and demolition
 Source: USACE 2021b

As shown in **Table 2.2-2**, it is anticipated that approximately half of the waste generated during the Proposed Action would be characterized as construction and demolition (C&D) waste. C&D waste is not radiologically contaminated and does not contain non-radioactive regulated solid waste such as lead or polychlorinated biphenyls (PCBs). Therefore, this waste can be recycled or disposed of in typical municipal solid waste (MSW) or C&D waste landfills. Non-radioactive regulated solid waste would likely include substances regulated by USEPA in accordance with RCRA, such as lead and lead-based paint (LBP); universal wastes, which are a class of RCRA-regulated materials that have less stringent management requirements (40 CFR 273); and substances regulated under TSCA, such as oils, equipment, and surfaces containing PCBs.

Based on the low levels of residual radioactivity at SM-1A, it is anticipated that radioactive waste that would be generated during the Proposed Action would be classified as either Class A, Class B, or Class C low-level radioactive waste (LLRW), in accordance with 10 CFR 61.55. Class A LLRW requires the fewest long-term considerations for disposal and Class C requires the most. Wastes that would be generated by the Proposed Action are further discussed in **Section 3.10**.

Waste would be segregated throughout the duration of the Proposed Action according to each disposal facility's waste acceptance criteria. C&D waste would be recycled to the extent possible, or disposed of at on- or off-post landfills. Non-radioactive regulated solid waste would be managed in accordance with applicable federal and state requirements as well as Fort Greely environmental policies and procedures, including the installation's Integrated Solid Waste Management Plan and spill report procedures. Radioactive waste, non-radioactive regulated solid waste, and C&D waste generated during the Proposed Action would be managed, characterized, packaged, transported, and disposed of in accordance with applicable federal, state, and local regulatory and permit requirements.

All waste generated during the Proposed Action would be initially transported from the SM-1A site by trucks. On-post waste transportation routes would follow existing roads and avoid residential areas, recreational facilities, and other sensitive land uses to the extent practicable. C&D waste would be transported directly from the SM-1A site to appropriate recycling or disposal facilities in typical dump trucks or in end-dump roll-off containers. Radioactive waste and non-radioactive regulated solid waste would be characterized and packaged at the SM-1A site, then temporarily staged at an on-post area, in accordance with applicable regulations, prior to transport from Fort Greely to appropriate disposal facilities in the contiguous 48 states. The location of the temporary on-post waste staging area has not been identified; however, at a minimum it would be a graded, level site at least 2 acres in size with a concrete pad, security fence, and remote security monitoring. Overweight and/or oversize SM-1A components requiring specialized transport requirements, such as the Reactor Pressure Vessel (RPV), would be transported directly from the SM-1A site for disposal in the contiguous 48 states. Off-post waste transportation would follow existing routes (e.g., roads, rail lines, navigation routes). Waste transportation is further discussed in **Section 3.7**.

There are no NRC-permitted radiological waste disposal facilities in Alaska (ADEC 2020a). Additionally, with the exception of certain types of asbestos-containing materials (ACM), the disposal of most non-radioactive solid waste regulated under RCRA and TSCA is prohibited in Alaska. Therefore, all radioactive waste and most non-

radioactive regulated solid waste generated by the Proposed Action would be transported to permitted facilities in the contiguous 48 states for disposal. This waste would be sorted, packaged, and transported by trained and qualified contractors in accordance with applicable regulatory requirements established by the NRC, U.S. Department of Transportation (USDOT) (including the International Maritime Dangerous Goods [IMDG] Code), USEPA, other federal agencies, and the State of Alaska. Radioactive waste and non-radioactive regulated solid waste would likely be packaged in intermodal shipping containers ranging in capacity from 25 to 40 cubic yards. USACE and its contractor would evaluate packaging options throughout the Proposed Action and select the safest and most efficient waste packaging and transport options available.

Existing licensed and permitted facilities in the contiguous 48 states that USACE is considering for disposal of radioactive waste and/or non-radioactive regulated solid waste include the following:

1. Waste Control Specialists, LLC
Federal Waste Facility
9998 West State Hwy 176
Andrews, Texas 79714
2. U.S. Department of Energy (USDOE) Nevada National Security Site
Nevada Field Office
National Nuclear Security Administration
Las Vegas, Nevada 89193-8518
3. USDOE Hanford Nuclear Reservation
Environmental Restoration Disposal Facility
Richland, Washington 99352
4. Energy Solutions
Interstate 80, Exit 49
Grantsville, Utah 84029
5. U.S. Ecology Washington
1777 Terminal Drive, Suite A
Richland, Washington 99354
6. U.S. Ecology Idaho
20400 Lemley Road
Grand View, Idaho 83624

The disposal of radioactive waste and non-radioactive regulated solid waste at the facilities listed above, or at similar types of facilities in the contiguous 48 states, has been previously evaluated in NEPA documentation prepared separately from this Draft EA (**Section 1.8.3**).

As described above, radioactive waste and non-radioactive regulated solid waste would initially be transported from the SM-1A site by truck. Some waste, primarily consisting of C&D waste, could be disposed of at the Delta Junction Landfill or another regional disposal site, transfer station, or recycling facility. Radioactive waste and non-radioactive regulated solid waste destined for disposal in the contiguous 48 states would be trucked to Fairbanks and transferred to rail cars. From Fairbanks, the waste would travel by rail

to either the Port of Alaska (near Anchorage) or the Port of Whittier, then transported via vessel to the Port of Seattle. From Seattle, the waste would travel via rail or truck to one of the available disposal sites in Washington, Utah, Idaho, Nevada, and/or Texas. Waste transportation modes used throughout the Proposed Action would adhere to established routes; waste transportation methodologies would conform to practices previously evaluated in NRC NEPA documents, and approved.

The transportation of waste by truck and/or rail through Canada from Fort Greely to disposal facilities in the contiguous 48 states is not currently anticipated due to the additional time that would be required to satisfy applicable Canadian regulatory compliance and permitting requirements; the increased duration and potential safety risks of truck transport over long distances in an arctic or sub-arctic environment (the nearest railhead where cargo could be transferred to trains is in Edmonton, approximately 1,731 road-miles from Fort Greely); and the resulting inefficiencies from transportation of smaller volumes by truck relative to other modes, such as train or vessels. Therefore, the shipment of waste from SM-1A through Canada is not addressed further in this Draft EA.

Some waste could be transported from Fort Greely to the contiguous 48 states by air. The types and quantities of waste that would be transported by air, the type(s) of aircraft that would be used, receiving airports or military airfields, and other factors regarding this transportation option are not known at the current stage of planning. USACE would continue to evaluate this option as project planning continues, and would prepare supplemental NEPA documentation as necessary if this option is selected for implementation.

The initial shipments of waste from the SM-1A site would be expected to begin in the summer of 2023. A total of approximately 505 waste containers or truckloads would be transported from Fort Greely during the Proposed Action (**Table 2.2-2**). On average, it is anticipated that approximately 104 containers or truckloads would be transported from Fort Greely each shipping season between 2023 and 2026. However, the actual number of containers that would be transported during each season would vary based on project schedule. It is likely that the number of containers shipped between 2024 and 2026 would exceed the average noted above due to the anticipated schedule of decommissioning and dismantlement activities.

Transportation of waste from Fort Greely is subject to weight restrictions during the spring months (i.e., during the thaw period) and may be limited due to weather during the fall and winter. During the transportation seasons, trucks would transport waste destined for in-state disposal directly to the disposal or recycling facility. Waste containers destined for out-of-state disposal would be transported on a routine schedule (e.g., twice a week) to a rail yard in Fairbanks for transfer to trains for transit to the Port of Alaska or the Port of Whittier (USACE 2020a).

The RPV is the most radioactive item remaining at SM-1A. It is also the most substantial in terms of weight when considering the additional shielding that would be necessary for shipping. The use of a large crane would be required to lift the RPV from the primary shield tank for placement into a USDOT-compliant shielded shipping container for disposition. The packaged RPV would be anticipated to weigh approximately 60,000 to 80,000 pounds, not including the transport vehicle. Heavy equipment required during the

Proposed Action (e.g., cranes, skid loaders, forklifts, and boom lifts) would be mobilized to the SM-1A site as needed due to space constraints.

Waste disposition surveys would be conducted periodically throughout the Proposed Action to demonstrate that non-radioactive wastes and land areas meet the applicable unrestricted release criteria. A Material Categorization, Survey, and Release Plan would be developed to establish the framework for releasing structures and M&E as non-radiologically impacted waste. Building surfaces and M&E would be surveyed and released for disposal in accordance with the Multi-Agency Radiation Survey and Assessment of Materials and Equipment Manual (NRC 2009). Land areas would be surveyed and released in accordance Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (NRC 2000). The Material Characterization, Survey, and Release Plans would be approved by USACE prior to conducting each waste disposition survey.

Following the removal of SM-1A facilities and infrastructure, Final Status Surveys (FSSs) would be conducted as necessary to ensure that excavated areas and remaining soils meet unrestricted release criteria. FSS results would be confirmed by Oak Ridge Institute for Science and Education, an independent verification contractor. Excavated areas of the SM-1A site would then be backfilled with clean fill soils meeting applicable Fort Greely requirements. The site would be graded and compacted to achieve positive drainage, then seeded with native grasses to prevent soil erosion. The SM-1A site would be considered suitable for release for unrestricted use once it is determined that the average member of a critical group would not receive a total effective dose equivalent in excess of 25 mrem per year above background radiation levels, in accordance with radiological dose criteria in 10 CFR 20.1402 (**Section 1.2.3**).

Following completion of the Proposed Action, future use or redevelopment of the SM-1A site would be at the discretion of Fort Greely and the UP contractor. As applicable, NEPA documentation would be prepared separately from this Draft EA for future use or redevelopment of the site.

2.3 Environmental Impact Minimization

The Proposed Action would incorporate BMPs to proactively minimize environmental impacts and comply with applicable environmental regulatory requirements (**Table 2.3-1**). The development and implementation of formal mitigation measures would not be required because potential adverse impacts from the Proposed Action would be less-than-significant.

Table 2.3-1: Best Management Practices Applicable to the Proposed Action

Resource Area	BMP
Cultural Resources (Draft EA Section 3.2)	In consultation with the SHPO and other participating consulting parties, develop a MOA with stipulations to resolve adverse effects on historic properties in accordance with 36 CFR 800.6(c).
	Adhere to the unanticipated discovery plan set forth in the 2020-2025 USAG Alaska ICRMP in the event that a previously unidentified archaeological site, which could include human remains, funerary or sacred objects, or other items of cultural patrimony, is discovered during the Proposed Action.
Water Resources (Draft EA Section 3.3)	Prepare and adhere to a site-specific SWPPP as a condition of coverage under the CGP to manage the quality and quantity of stormwater discharged from the SM-1A site.
	Capture, containerize, and characterize contact water from decommissioning activities (e.g., wet saw cutting, power washing, decontamination) and dispose of accordingly at permitted off-post facilities, in accordance with a site-specific liquid effluent monitoring plan that would be prepared as part of the project-specific Environmental Monitoring and Control program.
	Prepare and adhere to a project- and site-specific SPCC Plan.
	In accordance with the SPCC Plan, provide spill containment and cleanup kits in conspicuous and accessible locations throughout the SM-1A site for use in the event of an unintended release of contaminants or regulated materials.
Socioeconomics and Environmental Justice (Draft EA Section 3.4)	Continue public engagement with local communities on and around Fort Greely throughout the duration of the Proposed Action.
	Continue to maintain information regarding the Proposed Action on the USACE project website (https://www.nab.usace.army.mil/SM-1A/).
	BMPs identified for other resources listed in this table would minimize potential adverse impacts on nearby on- and off-post communities, particularly from noise, air pollutant emissions, fugitive dust, traffic, waste, and safety and health. Adherence to these BMPs would ensure that potential impacts on environmental justice communities are not disproportionately adverse.
Biological Resources (Draft EA Section 3.5)	Adhere to applicable policies and practices set forth in the Fort Greely Draft INRMP to prevent or minimize the introduction and spread of invasive plant species, such as only using certified weed-free seed mixtures during revegetation.
	Use spotters or escort vehicles, as determined necessary, to minimize the risk of collisions with moose or other wildlife during on-post vehicle operations (e.g., waste transport).
	Coordinate with the Fort Greely Directorate of Public Works, Environmental Division, to determine the most appropriate course of action if an active MBTA-protected bird nest is observed on the SM-1A site.
Air Quality (Draft EA Section 3.6)	Directly load (i.e., do not stockpile) radioactive waste and non-radioactive regulated solid waste into appropriate containers for transport.
	Transport radioactive waste and non-radioactive regulated solid waste in closed containers meeting applicable regulatory requirements.
	Cover payloads of C&D waste and backfill soils in trucks while in transit.
	Periodically spray water on on-post paved and unpaved haul roads, as weather conditions allow.
	Cover clean backfill soil stockpiles or periodically spray with water, as weather conditions allow.

Table 2.3-1: Best Management Practices Applicable to the Proposed Action

Resource Area	BMP
Transportation and Traffic (Draft EA Section 3.7)	Use trained and qualified contractors to transport waste in accordance with applicable federal and state regulatory requirements for disposal at permitted on-post and/or off-post facilities.
	Implement a transportation management plan that identifies approved on-post travel routes to and from the SM-1A site for heavy trucks transporting materials, equipment, and waste.
	Schedule decommissioning-related traffic (particularly heavy truck traffic) for off-peak hours when feasible and in coordination with Fort Greely and other affected organizations.
	Package and ship all radioactive and non-radioactive waste in accordance with the WTDP, as well as applicable regulatory and permit requirements established by NRC, USDOT(including IMDG), USEPA, the State of Alaska, and other agencies.
Utilities (Draft EA Section 3.8)	Coordinate with potentially affected facilities regarding temporary planned utility service shutoffs or disruptions to prevent or minimize impacts on their operations.
	Sequence or stagger temporary planned utility service shutoffs or disruptions to the extent feasible.
Soils (Draft EA Section 3.9)	Prepare and adhere to a project- and site-specific SWPPP as a condition of coverage under the CGP. Adherence to the SWPPP would manage the quantity and quality of stormwater discharged from the SM-1A site, prevent or minimize the migration of temporarily disturbed or stockpiled soils, and the corresponding sedimentation of receiving waterbodies.
	Replace soils excavated from the SM-1A site with clean fill soils meeting applicable Fort Greely requirements.
	Implement an environmental monitoring plan and conduct soil sampling to support release of the site.
	Conduct an FSS following the removal of SM-1A facilities and infrastructure to ensure remaining soils meet the unrestricted release criteria.
	Seed the site with native grasses following backfill and grading to prevent soil erosion.
Waste (Draft EA Section 3.10)	Prepare and adhere to a Hazardous Material Abatement Plan in accordance with EM 385-1-1, <i>Safety and Health Requirements</i> to establish procedures for the management and disposition of non-radioactive regulated solid waste.
	Implement a Waste Management and Disposal Plan that would establish procedures and requirements for the safe management, handling, storage, and transportation of waste to optimize safety and prevent or minimize risks to the extent possible.
	Manage and dispose of non-radioactive regulated solid waste in accordance with applicable requirements established by USEPA through its enforcement of RCRA, TSCA and those established by ADEC, where applicable.
	Prepare and adhere to a project- and site-specific SPCC Plan to prevent or minimize the potential for accidental spills of petroleum products or other regulated materials from decommissioning-related vehicles and equipment, and establish procedures for containing and cleaning up any spills that may occur.
	Provide spill containment and cleanup kits in conspicuous and accessible locations throughout the SM-1A site in accordance with the SPCC Plan for use in the event of an unintended release of regulated materials.

Table 2.3-1: Best Management Practices Applicable to the Proposed Action

Resource Area	BMP
Safety and Health (Draft EA Section 3.11)	Implement an Industrial Safety Program to establish safety and health procedures, practices, and the use of PPE.
	In accordance with EM 385-1-1, implement a site- and project-specific APP that would describe the specific work, work processes, equipment to be used, and hazards pertaining to the decommissioning activities.
	Implement a Waste Management and Disposal Plan that would establish procedures and requirements for the safe management, handling, storage, and transportation of waste to optimize safety and prevent or minimize risks to the extent possible.
	Prepare and adhere to AHAs that would define the steps to perform the work; assign risk assessment codes to each step; and identify the Competent Person(s) required for specific tasks.
	Prior to performing particularly hazardous tasks or operations, coordinate with on- or off-post fire and emergency services or other relevant organizations to identify and prevent or minimize potential risks.
	Conduct decommissioning activities in a controlled manner to minimize and keep radiological exposures ALARA in accordance with EM 385-1-80, <i>Radiation Protection</i> .
	Implement a Radiation Safety Program and Radiation Protection Plan that would require the use of applicable PPE and establish limits and monitoring for worker exposure to radiation in accordance with EM 385-1-1.
	Conduct environmental monitoring throughout the Proposed Action to ensure controls are adequate to protect human health and the environment.
	Enter into one or more MOAs with on- and/or off-post fire and emergency response services and/or emergency health care providers to minimize fire risk and ensure safety, define roles and responsibilities, and establish conditions for response, oversight, and monitoring.

Notes:

ADEC = Alaska Department of Environmental Conservation
 AHA = All Hazards Assessment
 ALARA = as low as reasonably achievable
 APP = Accident Prevention Plan
 BMP = best management practice(s)
 C&D = construction and demolition
 CFR = Code of Federal Regulations
 CGP = Construction General Permit
 EA = Environmental Assessment
 EM = Engineer Manual
 FSS = Final Status Survey
 ICRMP = Integrated Cultural Resources Management Plan
 IMDG = International Maritime Dangerous Goods
 INRMP = Integrated Natural Resources Management Plan

MBTA = Migratory Bird Treaty Act
 MOA = memorandum of agreement
 NRC = Nuclear Regulatory Commission
 PPE = personal protective equipment
 RCRA = Resource Conservation and Recovery Act
 SHPO = State Historic Preservation Office
 SPCC = Spill Prevention, Control, and Countermeasure
 SWPPP = Stormwater Pollution Prevention Plan
 TSCA = Toxic Substances Control Act
 USACE = United States Army Corps of Engineers
 USAG = United States Army Garrison
 USDOT = United States Department of transportation
 USEPA = United States Environmental Protection Agency
 WTDP = Waste Transportation and Disposal Plan

2.4 Alternatives Screening Process

2.4.1 Decommissioning Strategies and Alternative Screening Criteria

NEPA, CEQ regulations, and Army NEPA regulations require the objective consideration of reasonable alternatives. NRC regulations adopted by the Army limit the possible reasonable alternatives for decommissioning nuclear reactor facilities within 60 years of deactivation (NRC 2020a):

- **SAFSTOR:** The nuclear facility is maintained and monitored in a condition that allows the radioactivity to decay; afterward, the plant is dismantled and the property decontaminated.
- **Decontamination (DECON):** Equipment, structures, and portions of the facility containing radioactive contaminants are removed or decontaminated to a level that permits release of the property and termination of the permit.
- **Entombment (ENTOMB):** Radioactive contaminants are permanently encased on-site in structurally sound material such as concrete. The facility is maintained and monitored until the radioactivity decays to a level permitting restricted release of the property.

USACE considered each of these strategies during the initial process to develop alternatives for decommissioning SM-1A. However, only the Proposed Action met these regulations as incorporated in this action's purpose and need (**Section 1.3**):

USACE evaluated multiple alternatives for implementing the Proposed Action against the Purpose and Need which incorporates the various NRC and Army regulations.

Alternatives that were dismissed from further analysis in the EA are discussed in **Section 2.4.1**. Alternatives retained for analysis in the EA are discussed in **Section 2.4.2**.

2.4.2 Alternatives Considered but Dismissed from Detailed Analysis

USACE considered other alternatives for implementing the Proposed Action. These alternatives would not meet the Proposed Action's purpose and need. Therefore, they were dismissed from further evaluation in this EA. The rationale for dismissing each of these considered alternatives is summarized below.

2.4.2.1 Partial Dismantlement Alternative (DECON)

The Partial Dismantlement Alternative, a DECON alternative as described above, would remove radiologically contaminated structures, including Building J-5, the spent fuel pit, VC, Demineralizer Room, waste tanks pit, and radioactive M&E and radioactive waste encased in these structures. Radiologically contaminated soils on the SM-1A site that are accessible to excavation and earthmoving equipment (i.e., soils in open areas and/or adjacent to facilities that would not be dismantled) would also be removed. This alternative would result in the removal of nearly all of the radioactive contamination at SM-1A. This alternative would not require the dismantlement of Building 606 North. The UP contractor would remain in Building 606 North and the proposed decommissioning activities would be designed and implemented in a manner that would avoid impacting its operations in the building. USACE would demolish adjacent structures and remove

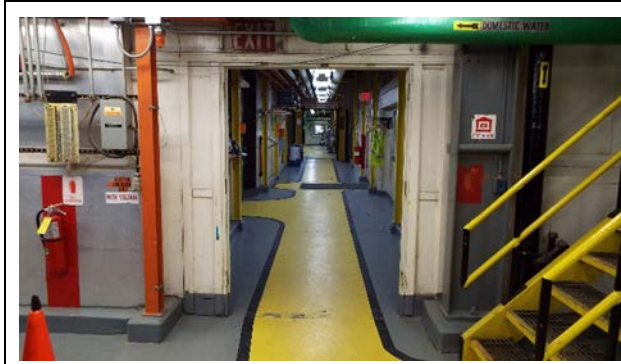
radioactive materials from the outside. Walls shared with Building 606 North would remain in place and exterior surfaces would be decontaminated to releasable levels. Due to the requirement to leave Building 606 North intact, this alternative would require the construction of one or more temporary containment structures adjacent to the VC and/or Building 606 North to capture dust and debris generated during the proposed decommissioning.

Some radioactive materials and residual contamination would remain in Building 606 North under this alternative (e.g., the internally contaminated steam turbine, embedded pipes under the concrete floor, and materials encased in the pipe pit). USACE would apply site-specific dose-based radiological release criteria in accordance with 10 CFR 20.1402 to release Building 606 North and the surrounding impacted area for unrestricted use and achieve permit termination. Site conditions cannot be fully understood without more extensive dismantlement and excavation; therefore, this alternative carries some inherent and unknown risks that could inhibit USACE's ability to successfully meet unrestricted use criteria in accordance with 10 CFR 20.1402 and achieve permit termination within 60 years of the reactor's deactivation.

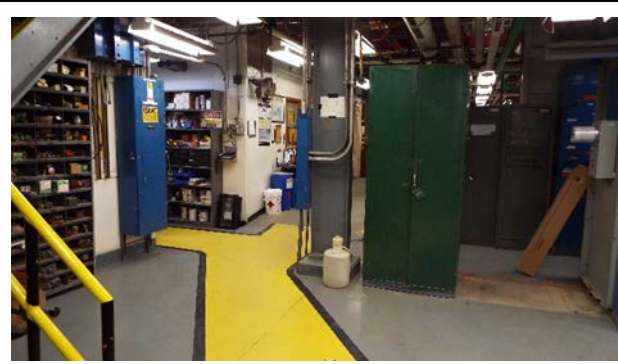
Aside from the potential risks associated with the unknown site conditions, this alternative would remove nearly all of the radioactive materials and contamination associated with SM-1A that may pose a risk to human health and by reducing the dose to the critical group to no more than 25 mrem per year above background levels in accordance with 10 CFR 20.1402 (**Section 1.2.3**). This alternative would also complete the decommissioning of SM-1A within 60 years of the reactor's deactivation. It would also avoid or minimize adverse effects on protected, beneficial, or valued environmental resources to the maximum extent possible. However, the Partial Dismantlement Alternative would fail to meet the Purpose and Need for the following reasons:

- The physically constrained nature of the SM-1A site, and the need to retain UP personnel and operations in Building 606 North, would increase risks of inadvertent radiological exposure and/or physical injury while performing decommissioning and dismantlement activities on the site.
- Due to the highly constrained character of the SM-1A site and interior areas of Building 606 North (**Photos 7 and 8**), and the requirement to leave Building 606 North intact while removing radioactive M&E and radioactive waste encased in associated structures, extensive engineering controls would be required to safely perform associated work activities.
- While some land area would become available for additional use to support the military mission and land use planning objectives at Fort Greely after demolition of some of the SM-1A structures, the area would be small and restricted by Buildings 606 North and South. Additionally, not all radiological contamination would be removed, and further remediation may be necessary in the future.

For these reasons, the Partial Dismantlement Alternative was dismissed from further analysis in this EA.



**Photo 7: Building 606 North, ground floor—
view through the annex connecting to Building
606 South**



**Photo 8: Building 606 North, ground floor—
view from the annex entry into Building 606
North**

2.4.2.2 Partial Entombment Alternative (ENTOMB)

The Partial Entombment Alternative, an ENTOMB alternative as described above, would leave some radiologically contaminated structures and the majority of the encased radioactive M&E on the SM-1A site. Under this alternative, Building J-5, the Demineralizer Room, and the spent fuel pit would be demolished, while the VC would be demolished to an elevation of approximately 6 feet above the ground surface (just above the height of the encased reactor shield tank). The VC would then be completely encased with cement/grout and an engineered structure would be constructed to entomb the remaining VC and the waste tank pit. The Partial Entombment Alternative would require substantial engineering where practicable to ensure that the entombment structure would meet current geotechnical, seismic, and similar applicable requirements and codes.

This alternative would not require the dismantlement of Building 606 North. The UP contractor would remain in Building 606 North, and its operations in the building would not be impacted. Shared walls would remain in place and incorporated into the entombment structure. Under this alternative, some radioactive materials and residual contamination would remain in Building 606 North (e.g., the internally contaminated steam turbine, embedded pipes under the concrete floor, and materials encased in the pipe pit). USACE would release Building 606 North for continued use and apply access and/or restrictions associated with the entombed areas.

For similar reasons as described for the Partial Dismantlement Alternative (**Section 2.4.2.1**), the Partial Entombment Alternative would fail to meet the Purpose and Need for this action. The requirement to leave Building 606 North intact and UP contractor personnel and operations in place while demolishing the adjoining structures and removing radioactive M&E and radioactive waste encased in associated structures, would increase the risk of exposure and/or injury from work-related accidents. Additionally, USACE would require a permit modification under this alternative to allow for the continued possession of radioactive materials in the entombment structure, including the reactor pressure vessel and steam generator, beyond 60 years of the reactor's deactivation. Because this alternative would continue to require a radioactive material possession permit, would require continued monitoring, and would fail to release the property for unrestricted use, Partial Entombment would not meet the Proposed Action's

purpose and need (**Section 1.3**). Therefore, the Partial Entombment alternative was dismissed from further evaluation in this EA.

2.4.3 Alternatives Retained for Detailed Analysis

2.4.3.1 No Action Alternative

Under the No Action Alternative, USACE would continue to maintain SM-1A in a SAFSTOR condition under its current Reactor Possession Permit (SM1A-1-19, Amendment 1-20). The ARP's mission to deactivate SM-1A would be delayed or defunct, should decommissioning not take place within 60 years (by 2032) of its deactivation. USACE would require a permit modification under this alternative to allow for the continued possession of radioactive materials at SM-1A—including the RPV and steam generator—beyond 60 years of the reactor's deactivation.

However, the No Action Alternative would fail to meet the Purpose and Need for the following reasons:

- Radiological contamination potentially posing a risk to public health would remain on the site indefinitely.
- The decommissioning of SM-1A would not be completed within 60 years of the reactor's deactivation.
- The presence of buildings, structures, and equipment associated with SM-1A would not support the military mission or land use planning objectives at Fort Greely, and the remediation of radiological contamination would continue to be required

While the No Action Alternative would not meet the Proposed Action's purpose and need, it is analyzed in the Draft EA in accordance with 40 CFR 1502.14 to provide a comparative baseline for the analysis of potential effects from the Proposed Action Alternative.

2.4.3.2 Proposed Action Alternative (DECON)

The Proposed Action Alternative, a DECON alternative as described above, would implement the Proposed Action as described in **Section 2.2**. Adherence to the DP under the Proposed Action Alternative would reduce safety and health risks to the maximum extent possible by carefully planning and executing decommissioning tasks to prevent or minimize hazardous work conditions. Implementation of the Proposed Action Alternative by approximately 2028 would result in permit termination within 60 years (by 2032) of SM-1A's final shutdown. Adequate space would be available on the SM-1A site to conduct the Proposed Action Alternative safely and efficiently, and work sequencing would further minimize the space required to decommission SM-1A. The Proposed Action Alternative would release the site for unrestricted use in support of the military mission and land use planning objectives at Fort Greely, and remove residual radiological contamination on the site. As described in this Draft EA, the Proposed Action Alternative would, to the maximum extent possible, avoid or minimize any potential adverse environmental impacts from decommissioning SM-1A.

The Proposed Action Alternative would fulfill the Proposed Action's purpose and need by completing the decommissioning of SM-1A within 60 years (by 2032) of its final shutdown, releasing the SM-1A site for unrestricted use, and terminating the Army-issued decommissioning permit. Therefore, this alternative is carried forward for analysis in this EA.

3.0 Affected Environment and Environmental Consequences

3.1 Introduction

Chapter 3 describes the affected environment (i.e., the existing condition) of environmental resources at SM-1A and the environmental consequences (i.e., beneficial or adverse impacts) that would potentially result from the No Action Alternative and Proposed Action Alternative. The geographic extent of potential effects would vary; therefore, the affected environment (or ROI) is defined individually for each resource (the terms “impact” and “effect” are used synonymously throughout this Draft EA). Information on resources analyzed in this Draft EA was obtained through the review of previously prepared studies, reports, and other documentation obtained from USACE, Fort Greely, and other credible sources, such as regulatory agencies and the scientific and engineering communities.

Discussions of the affected environment and potential environmental consequences for each evaluated resource are presented in **Chapter 3** as follows:

- **Section 3.2**, Cultural Resources
- **Section 3.3**, Water Resources
- **Section 3.4**, Socioeconomics and Environmental Justice
- **Section 3.5**, Biological Resources
- **Section 3.6**, Air Quality
- **Section 3.7**, Transportation and Traffic
- **Section 3.8**, Utilities
- **Section 3.9**, Soils
- **Section 3.10**, Waste
- **Section 3.11**, Safety and Health

Thresholds for determining the significance of a potential impact on a particular resource are defined in the corresponding “Environmental Consequences” discussion in each section listed above. Generally, adverse impacts that are determined to be less-than-significant do not meet the conditions requiring preparation of an EIS as defined in 32 CFR 651.41. Actions not having a significant impact on the environment do not normally require the preparation of an EIS, as defined in 32 CFR 651.42.

BMPs to prevent or minimize the severity of potential adverse impacts are presented for each resource as applicable. For all resources evaluated in this Draft EA, a beneficial effect would occur if an alternative would result in the improvement of a resource’s condition in the ROI.

The Proposed Action’s potential cumulative impacts are described in **Chapter 4**.

Table 3.1-1 summarizes the resources that were dismissed from detailed analysis in accordance with 40 CFR 1500 because the Proposed Action would have no potential to meaningfully or measurably affect them.

Table 3.1-1: Resources Dismissed from Analysis in the Draft EA

Resource	Rationale for Elimination
Airspace	Airspace resources are not expected to be affected sufficiently to warrant further discussion and were eliminated from further analysis. The number of flights per day at the Fort Greely airfield is not anticipated to change during or as a result of the Proposed Action.
Land Use	As a federal military installation, Fort Greely is not subject to state and local land use and zoning ordinances, policies, plans, and guidelines. The Proposed Action would have no potential to affect off-post land uses and zoning. Removing SM-1A and returning the land to Fort Greely for unrestricted use under the Proposed Action would be consistent with and support on-post land uses. The Proposed Action would have no potential to affect the segment of the Trans-Alaska Oil Pipeline that bisects Fort Greely or the associated Pumping Station #9 2.5 miles southwest of the installation's Cantonment Area.
Noise	The volume, intensity, and duration of noise generated by decommissioning-related vehicles, equipment, and tools would vary throughout the Proposed Action and would be similar to other construction and operational noise generated on and around Fort Greely. While such noise could be an annoyance to nearby listeners, it would be unlikely to delay or prevent the continued operation of nearby facilities and functions. There would be no impacts on noise-sensitive land uses (e.g., hospitals, schools, religious facilities), as none are present near SM-1A. Following completion of the Proposed Action, the ambient noise conditions at Fort Greely would be similar to those that existed prior to decommissioning activities.
Recreation	The SM-1A site does not contain or provide recreational facilities for Fort Greely personnel or the general public, and is in an intensively developed, industrialized area of Fort Greely with similar, non-recreational land uses. The Proposed Action would not involve the temporary or permanent disturbance or alteration of existing recreational facilities on Fort Greely, and would not result in temporary or permanent disruptions of current or planned recreational activities on the installation. Therefore, recreation resources were dismissed from further analysis in this Draft EA.
Seismology	The Proposed Action would be implemented in accordance with applicable seismic engineering considerations and requirements. The Proposed Action would have no potential to influence existing seismic conditions, nor would it increase or induce seismic activity at or near the SM-1A site. Therefore, seismology was dismissed from further analysis in this Draft EA.
Geology and Topography	The SM-1A site is previously disturbed and consists of graded, generally level areas that support buildings, structures, and vehicle parking areas associated with SM-1A. No unique or noteworthy topographical or geological features have been documented on or under the SM-1A site, respectively, and the Proposed Action would have no potential to have temporary or permanent adverse effects on such features. Following completion of the Proposed Action, topography on the SM-1A site would be similar to existing conditions. Therefore, geology and topography were dismissed from further analysis in this Draft EA.
Wetlands and Floodplains	There are no wetlands on the SM-1A site or in Fort Greely's cantonment area. SM-1A is not in a 100-year floodplain. None of the activities associated with the Proposed Action would be conducted in or have the potential to disturb or alter wetlands or 100-year floodplains. Therefore, these resources were dismissed from analysis in this Draft EA.

Table 3.1-1: Resources Dismissed from Analysis in the Draft EA

Resource	Rationale for Elimination
Rare, Threatened, and Endangered Species	<p>No federal or state-listed threatened and endangered species have been documented at Fort Greely, and no federal critical habitat has been designated on the installation. The SM-1A site and on-post roads that would be used as transportation routes during the Proposed Action are in Fort Greely’s urbanized and intensively developed cantonment area, which does not provide suitable habitat for federal and state-listed species or rare plant species tracked by the Alaska Natural Heritage Program. With the exception of small areas of grass (maintained lawn) and ornamental trees and shrubs on the SM-1A site that do not provide suitable habitat for federal or state-listed species, the Proposed Action would not involve the removal of vegetation that could potentially provide habitat for federal or state-listed rare, threatened, and endangered species.</p> <p>In the event that active bird nests are observed on buildings and structures associated with SM-1A, including nests of species protected under the MBTA, those nests would be removed in accordance with applicable policies set forth in Fort Greely’s INRMP (USAG Alaska 2020b) and prescribed by the USFWS, the ADF&G, and/or other applicable federal and state regulatory agencies.</p> <p>No bald or golden eagles (<i>Haliaeetus leucocephalus</i> and <i>Aquila chrysaetos</i>, respectively) have been documented at Fort Greely.</p> <p>For these reasons, the Proposed Action would have no potential to adversely affect federal or state-listed species, critical habitat, or species protected under the MBTA or the Bald and Golden Eagle Protection Act. Thus, rare, threatened, and endangered species were dismissed from further analysis in this Draft EA.</p>
Visual Resources	<p>Although the VC is visually prominent at Fort Greely, it has not been documented as a particularly unique or noteworthy visual resource on the installation or in the surrounding area. Its removal under the Proposed Action would not be considered an adverse effect on the visual environment at Fort Greely. The Proposed Action would have no potential to temporarily or permanently affect any other unique or noteworthy visual resources or the visual environment at Fort Greely or in the surrounding area. Therefore, visual resources were dismissed from further analysis in this Draft EA. Potential effects on cultural resources, which includes architectural resources, are discussed in Section 3.2.</p>

Notes:

ADF&G = Alaska Department of Fish and Game
 EA = Environmental Assessment
 INRMP = Integrated Natural Resources Management Plan

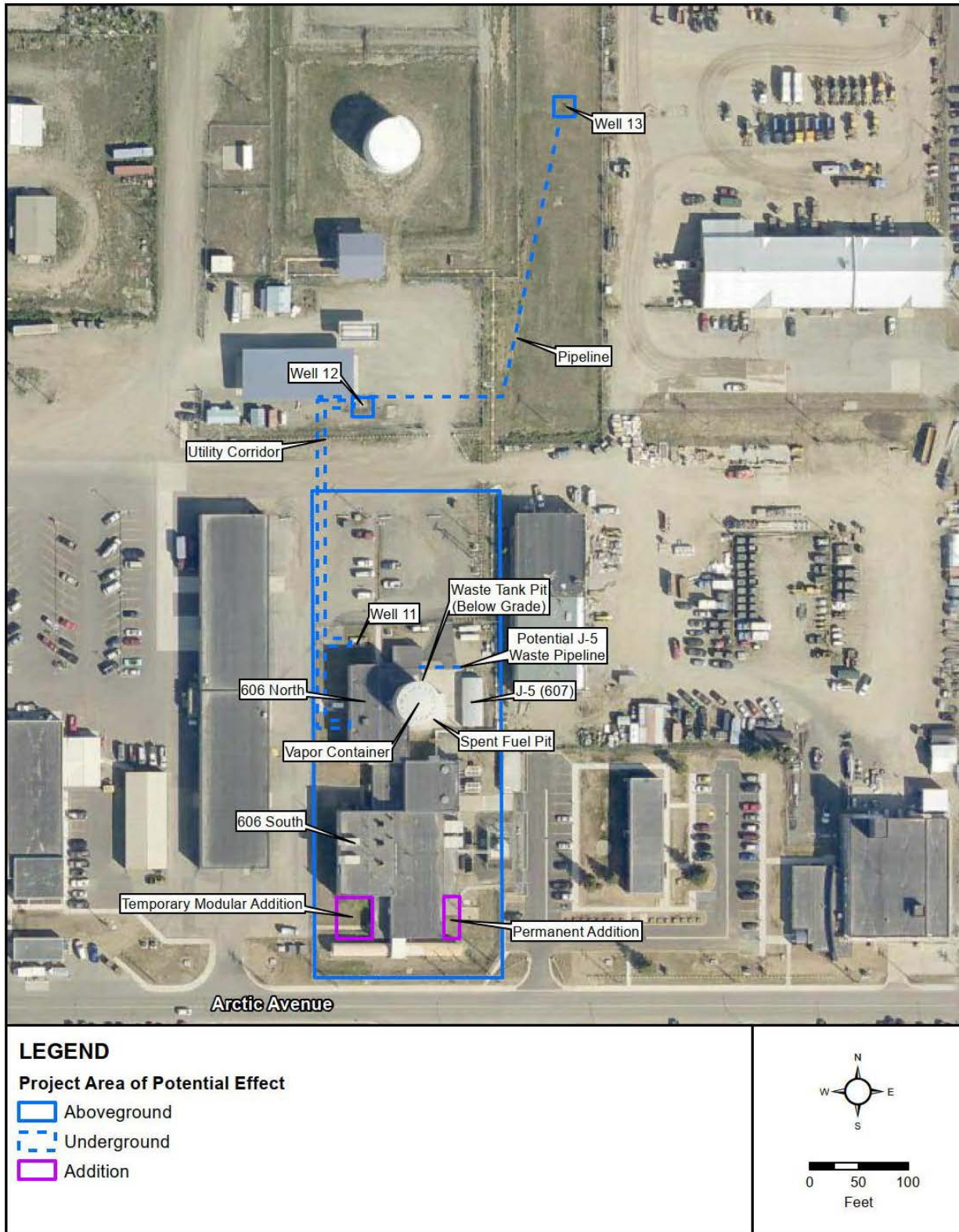
MBTA = Migratory Bird Treaty Act
 USFWS = U.S. Fish and Wildlife Service
 VC = Vapor Container

3.2 Cultural Resources

This section addresses cultural resources that would be potentially affected by the Proposed Action. Cultural resources include pre-contact and historic sites, buildings, structures, districts, objects, artifacts, or other physical evidence of human activity considered important to a culture or community for scientific, traditional, religious, or other reasons.

The Proposed Action’s Area of Potential Effect (APE) is defined as the SM-1A Reactor Facility, consisting of the fenced site that includes Building 606 North, Building 606 South, Building J-5 (also known as Building 607), Supply Well No. 11, and a portion of the former wastewater pipeline; Supply Well No. 12 and Recharge Well No. 13 and associated pipeline outside the fence; and an 8-foot-wide by 6-foot-deep excavation area encompassing the concrete utility corridor that runs from Building 606 North to Supply Wells No. 11 and No. 12 (**Figure 3.2-1**).

Figure 3.2-1: Proposed Action Area of Potential Effects in Fort Greely Historic District (AHRs XMH-1275)



USACE is the lead federal agency for purposes of NHPA Section 106 consultation regarding the Proposed Action evaluated in this Draft EA (**Table 3.2-1**).

3.2.1 Regulatory Setting

Regulations and guidance applicable to the Proposed Action and cultural resources in the ROI are summarized in **Table 3.2-1**.

Table 3.2-1: Regulations and Guidance Applicable to Cultural Resources

Regulation/Guidance ¹	Description
NHPA Section 106 (54 USC 300101 et seq.) and its implementing regulations (36 CFR 800)	Requires federal agencies are required to consider the effects of their actions on historic properties.
36 CFR 60, <i>National Register of Historic Places</i>	Establishes criteria for evaluating cultural resources for inclusion in the NRHP.
EO 11593, <i>Protection and Enhancement of the Cultural Environment</i>	Requires federal agencies to initiate measures to assure that federal plans, policies, and programs contribute to the preservation and enhancement of cultural resources.
USAG Alaska 2020-2025 ICRMP (USAG 2020a)	The ICRMP provides the information necessary to make decisions regarding the treatment of cultural resources on USAG Alaska-managed lands, including Fort Greely. The ICRMP includes management procedures for NHPA Section 106 consultation as well as for unanticipated discoveries.

Notes:

¹ This list includes the primary regulations and guidance that apply to this resource area; it is not meant to be comprehensive. Other regulatory requirements may also apply.

CFR = Code of Federal Regulations

EO = Executive Order

ICRMP = Integrated Cultural Resources Management Plan

NHPA = National Historic Preservation Act

NRHP = National Register of Historic Places

USAG = U.S. Army Garrison

USC = United States Code

3.2.2 Affected Environment

U.S. Army Garrison (USAG) Alaska manages historic properties on its lands—including Fort Greely—in accordance with the 2020-2025 Integrated Cultural Resources Management Plan (ICRMP). The ICRMP sets forth procedures for NHPA Section 106 consultation as well as for unanticipated discoveries (USAG Alaska 2020a).

The APE is in the Fort Greely New Post Historic District (Alaska Heritage Resources Survey [AHRs] XMH-1275) and the Fort Greely Cold War Historic District (AHRs XMH-845) (AHRs 2020a; USAG Alaska 2020a). Although two Alaska Heritage Resources Survey (AHRs) historic district site numbers exist, XMH-1275 and XMH-845 refer to the same historic district and geographic boundary. The district was determined eligible for the National Register of Historic Places (NRHP) in 2000 under Criterion A with a period of significance of 1946 to 1989 associated with the Cold War era at Fort Greely. The district contains 23 contributing buildings and three non-contributing buildings in the New (South) Post; three additional buildings have been demolished (USAG Alaska 2020a; AHRs 2020).

Building 606 (AHRs XMH-670) is eligible for the NRHP as a contributing resource to the Fort Greely New Post/Cold War Historic District and is the primary resource in the SM-1A

Reactor Facility. Originally constructed in 1955, Building 606 functioned as an electric power and steam heat production plant and water treatment facility to provide electricity and steam heat to Fort Greely. The building was modified from 1958 to 1962 with new construction at the north end to support SM-1A, one of a series of prototype nuclear reactors commissioned by USACE through the Army Nuclear Power Program (HABS 1999). USACE chose Fort Greely for the SM-1A Reactor Facility to test and demonstrate the feasibility of a nuclear power plant in a remote arctic environment. Fort Greely's remote arctic setting, high fuel costs in the area, base expansion, and need for additional electrical power and heating steam were key factors in USACE's site selection.

Building J-5/607 (AHRS XMH-671), although previously determined non-contributing to the Fort Greely New Post/Cold War Historic District, contributes to the SM-1A Reactor Facility property as a secondary resource. Built in 1966, the rectangular Quonset-hut metal building was used as a general storehouse during the Cold War era and for nuclear waste storage. Supply Well No. 11 is a contributing landscape element in the property boundary. Outside the fence, Supply Well No. 12, and Recharge Well No. 13 are part of the SM-1A Reactor Facility's former operations, but these utility-related elements, along with the underground wastewater dilution pipeline and utility corridor are not necessary to convey the significance of the property.

The Army has determined that the SM-1A Reactor Facility is individually eligible for listing in the NRHP. The SM-1A Reactor Facility is nationally significant under NRHP Criterion A for its association with Engineering and Science and conveys USACE's prototype nuclear reactor program during the Cold War era. In consultation with USAG Alaska and Alaska SHPO, the Army has prepared a NRHP determination of eligibility for the SM-1A Reactor Facility, which includes Building 606 North, Building 606 South, Building J-5/607, Supply Well No. 11, and a portion of the former wastewater pipeline, as well as Supply Well No. 12 and Recharge Well No. 13 outside the fence. A NRHP evaluation for the SM-1A Reactor Facility was submitted to the Alaska SHPO for review and concurrence on December 18, 2020. In a letter dated January 22, 2021 the Alaska SHPO concurred with the Army's determination that SM-1A is eligible for listing in the NRHP. A copy of this letter is provided in **Appendix A**.

Archaeological survey work around Fort Greely began in the 1970s. Work covering the entire Fort Greely cantonment area began in earnest in 2002, covering 7,500 acres of land (USAG Alaska 2020a). No archaeological resources have been identified in the APE or the vicinity of the Fort Greely New Post. Due to ground disturbance caused during the development of Fort Greely's New Post and the construction of the SM-1A Reactor Facility, it is unlikely that archaeological resources are present in the APE.

3.2.3 National Historic Preservation Act Section 106 Consultation

NHPA Section 106 consultation for the Proposed Action is being conducted in parallel with the NEPA process and preparation of this Draft EA. Consultation for the undertaking was initiated with the Alaska SHPO by letter dated June 19, 2020. The Alaska SHPO's concurrence on the APE was received on July 16, 2020. Letters dated June 23, 2020 were sent to the following tribal governments, entities, and agencies with an invitation to participate in the NHPA Section 106 consultation for the Proposed Action:

- Native Village of Cantwell
- Chickaloon Native Village
- Village of Dot Lake
- Native Village of Eklutna
- Gulkana Village
- Healy Lake Village
- Knik Tribe
- Nenana Native Association
- Northway Village
- Native Village of Tanacross
- Native Village of Tetlin
- Cook Inlet Region, Inc.
- Ahtna, Inc.
- Chickaloon Moose Creek Native Association, Inc.
- Doyon, Limited
- Eklutna, Inc.
- Tanana Chiefs Conference
- Toghoththele Corporation
- Bureau of Indian Affairs – Anchorage Agency
- Bureau of Indian Affairs – Fairbanks Agency

By letter dated December 18, 2020, the following organizations were invited to participate as consulting parties during the NHPA Section 106 process for the Proposed Action:

- Alaska Historical Commission
- Alaska Historical Society
- American Nuclear Society
- Delta Junction
- Nuke Digest
- University of Alaska Museum of the North
- University of Alaska-Fairbanks Rasmuson Library

A representative copy of these invitation letters is provided in Appendix A. To date, Delta Junction and Nuke Digest have agreed to participate as consulting parties in the NHPA Section 106 process.

Detailed information about the Proposed Action was submitted to the ACHP on the same date via email. In a letter dated January 4, 2021, the ACHP declined to participate in the NHPA Section 106 consultation process unless requested to do so by a consulting party.

3.2.4 Environmental Consequences

This section describes the potential impacts on cultural resources in the ROI from the No Action Alternative and Proposed Action Alternative. Impact significance thresholds used for this analysis are presented in **Table 3.2-2**.

Table 3.2-2: Cultural Resources Impact Significance Thresholds

Impact Significance Threshold	Impact Significance Threshold Definition
Less-than-significant adverse impact	The alternative would result in an adverse effect on a historic property by altering any of the characteristics that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association; however, such impacts would be avoided, minimized and/or mitigated per NHPA Section 106.
Potentially significant adverse impact	The alternative would result in an adverse effect on a historic property by altering any of the characteristics that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association; and those effects would not be avoided, minimized, and/or mitigated per NHPA Section 106.

Notes:

NHPA = National Historic Preservation Act

NRHP = National Register of Historic Places

3.2.4.1 No Action Alternative

Under the No Action Alternative, the proposed decommissioning would not be implemented, and USACE would continue to maintain SM-1A as it currently does. There would be no removal of the SM-1A Reactor Facility, associated ground-disturbing activities, or alterations to NRHP-eligible historic properties. Therefore, the No Action Alternative would have no effect on cultural resources.

3.2.4.2 Proposed Action Alternative

The Proposed Action would demolish key elements of the NRHP-eligible SM-1A Reactor Facility and remove contributing resources from the NRHP-eligible Fort Greely Historic District. This would result in an adverse effect on historic properties under NHPA Section 106. USACE is consulting with the Alaska SHPO and other participating consulting parties to develop a memorandum of agreement (MOA) that will identify stipulations to resolve adverse effects on historic properties. The MOA, once executed, would resolve the adverse effect consistent with 36 CFR 800.6(c).

Ground-disturbing activities would occur in previously disturbed areas where archaeological sites have not been identified, and that are unlikely to contain cultural resources. In accordance with 36 CFR 800.13(b), the USAG ICRMP unanticipated discovery plan would be followed in the event that a previously unidentified archaeological site, which could include human remains, funerary or sacred objects, or other items of cultural patrimony, is discovered during construction (USAG Alaska 2020a).

Therefore, through consultation with the SHPO and other participating consulting parties, execution of a MOA in accordance with NHPA Section 106, and implementation of BMPs, adverse effects on cultural resources from the Proposed Action Alternative would be less-than-significant.

3.2.5 Cultural Resources BMPs

The following BMPs would be implemented to prevent or minimize the Proposed Action Alternative's adverse effects on cultural resources in the ROI:

- In consultation with the SHPO and participating consulting parties, USACE will execute a MOA with stipulations to resolve the adverse effect on historic properties in accordance with 36 CFR 800.6(c).
- In accordance with 36 CFR 800.13(b), the unanticipated discovery plan set forth in the 2020-2025 USAG Alaska ICRMP would be followed in the event that a previously unidentified archaeological site, which could include human remains, funerary or sacred objects, or other items of cultural patrimony, is discovered during the Proposed Action Alternative.

Execution of a MOA between USACE, the Alaska SHPO, and participating consulting parties will establish responsibilities for USACE to complete prior to implementing the Proposed Action Alternative. In accordance with NHPA Section 106, USACE has proposed the following stipulations in the MOA:

A. *Historic American Engineering Record (HAER) Level III-Equivalent Documentation:* HAER-equivalent documentation is appropriate to resolve adverse effects on significant historic properties, such as the SM-1A Reactor Facility. USACE shall prepare (or direct to be prepared) documentation equivalent to HAER Level III standards as defined in the *Secretary of the Interior Standards and Guidelines for Architectural and Engineering Documentation*.

The HAER Level III-equivalent documentation shall include the SM-1A Reactor Facility, including Buildings 606 and 607 and associated infrastructure. The documentation will include information obtained from USACE's Office of History and Fort Greely, including motion picture film, photographs, and documents, as appropriate.

- B. On completion, USACE will submit the draft documentation to the Signatories and other consulting parties for their 30-day review. USACE shall incorporate and/or respond to all submitted comments before finalizing the documentation.
- C. USACE shall provide copies of the final documentation to SHPO, Fort Greely, and the USACE Office of History. USACE will identify other appropriate repositories for the documentation in consultation with the Signatories and other consulting parties. USACE shall ensure the resulting documentation is suitable for dissemination to the public with the goal of creating awareness for the historical significance of the SM-1A Reactor Facility. USACE shall provide copies of the documentation to the other consulting parties upon written request.
- D. Within 2 years of USACE's award of the decommissioning and dismantlement contract, USACE shall distribute a draft digital version of a proposed historical plaque/marker to the Signatories and other consulting parties. This historical plaque/marker's design shall be agreed upon by the Signatories with input from the other consulting parties prior to installation. Within 1 year of completion of the decommissioning and dismantlement, USACE/Fort Greely shall erect the agreed upon plaque/marker at the previous site of SM-1A. Additional plaques/markers

shall be installed at publicly accessible sites. These additional plaques/markers shall have their designs and locations agreed on by the Signatories and consulting parties prior to installation. On final installation of these historical plaque/markers, USACE/Fort Greely shall photograph the installed plaque/markers and distribute to all the Signatories and consulting parties.

- E. During decommissioning and dismantlement, when safe and feasible, USACE shall salvage historical items from the SM-1A Reactor Facility, including but not limited to informational safety plaques and currently unknown salvageable time capsule contents. Within 2 years of USACE's award of the decommissioning and dismantlement contract, USACE will develop a detailed plan for the identification, curation, storage, and transportation of these historical items, along with specific steps for consultation. USACE shall submit this plan for review and comment by the Signatories and other consulting parties.

Salvaged items will remain under the control of the Army; items shall be salvaged from SM-1A and sent to an as-yet unidentified facility for storage. USACE will distribute a letter to the Signatories and other consulting parties with an item inventory and location, as well as a point of contact to help retrieve items for future exhibits. USACE shall inform the Signatories and other consulting parties of circumstances that will prevent salvage and display of these items.

- F. Since the HAER Level III-equivalent documentation will document the decommissioning and dismantlement process, USACE shall complete the requirements of Stipulations I.A through I.C within 1 year of completion of the decommissioning and dismantlement of the SM-1A Reactor Facility (currently estimated for completion by 2028).

A copy of the executed MOA containing the stipulations agreed to by USACE, Alaska SHPO, and the consulting parties, will be included in an appendix to the Final EA.

3.3 Water Resources

This section discusses water resources that would be potentially impacted by the Proposed Action. Water resources include surface water, water quality, groundwater, and stormwater. The ROI for the analysis of water resources includes surface waterbodies and groundwater formations in and outside the boundaries of Fort Greely that potentially receive drainage or infiltration, respectively, from the SM-1A site.

The Proposed Action would have no potential to affect wetlands and floodplains. Therefore, these resources are not discussed further in this Draft EA (**Table 3.1-1**).

3.3.1 Regulatory Setting

Regulations and guidance that are applicable to the Proposed Action and water resources in the ROI are summarized in **Table 3.3-1**.

Table 3.3-1: Regulations and Guidance Applicable to Water Resources

Regulation/Guidance ¹	Description
Federal	
CWA (33 USC 1251 et seq.)	The CWA establishes requirements for regulating discharges of pollutants into waters of the U.S. and regulating quality standards for surface waters. CWA Section 303 requires states to identify waters in which current pollution control technologies alone cannot meet water quality standards. The NPDES program, administered by USEPA, regulates discharges of pollutants to navigable waters.
NWSR Act (Public Law 90-542; 16 USC 1271 et seq.)	The NWSR Act was enacted in 1968 to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. Designated segments need not include the entire river and may include tributaries. For federally administered rivers, the designated boundaries generally average 0.5 mile on rivers outside national parks in Alaska to protect river-related values (NWSRS 2020). The NWSR Act defines a “wild” river as free of impoundments, generally inaccessible except by trail, and has exceptionally clean waters. “Scenic” segments are free of impoundments and have shorelines that are largely undeveloped, but are accessible by road. “Recreational” segments are accessible by road and may have some development along their shorelines (BLM 2020).
SDWA (42 USC 6901 et seq.)	The SDWA was enacted in 1974 to protect public health by regulating the nation’s public drinking water supply. The SDWA authorizes USEPA to set national health-based standards for drinking water to protect against both naturally occurring and human-made contaminants that may be found in drinking water.
State of Alaska	
ADEC 18 AAC 70, <i>Water Quality Standards</i>	Regulates and establishes water quality standards and criteria throughout the state of Alaska.
DOD/U.S. Army/Fort Greely	
AR 200-1, <i>Environmental Protection and Enhancement</i>	Implements federal, state, and local environmental laws and DOD policies for preserving, protecting, conserving, and restoring the quality of the environment.
Fort Greely INRMP, 2017-2021	Establishes policies, programs, requirements, projects, and procedures for the management of natural resources at Fort Greely.

Notes:

¹ This list includes the primary regulations and guidance that apply to this resource area; it is not meant to be comprehensive. Other regulatory requirements may also apply.

- | | |
|--|---|
| AAC = Alaska Administrative Code | NPDES = National Pollutant Discharge Elimination System |
| ADEC = Alaska Department of Environmental Conservation | NWSR = National Wild and Scenic Rivers |
| AR = Army Regulation | SDWA = Safe Drinking Water Act |
| CWA = Clean Water Act | U.S. = United States |
| DOD = Department of Defense | USC = United States Code |
| INRMP = Integrated Natural Resource Management Plan | USEPA = United States Environmental Protection Agency |

3.3.2 Affected Environment

3.3.2.1 Surface Water

Surface water resources include lakes, rivers, and streams. In the ROI, the Delta River and Jarvis Creek flow in a generally northern direction across Fort Greely approximately 2 miles west and 1 mile east of SM-1A, respectively (**Figure 1.2-1**). Jarvis Creek is approximately 43 miles long, originating from the Jarvis Glacier south of Fort Greely and

converging with the Delta River along the installation's northern boundary approximately 3.6 miles north of SM-1A. The Delta River flows from its headwaters in the Tangle Lakes of the Alaska Range, approximately 40 miles (in a direct line) south of Fort Greely, to its convergence with the Tanana River at Big Delta approximately 10 miles downstream (north) of the installation. The Delta River watershed covers 150,000 acres (234 square miles) and includes 160 miles of streams and 21 lakes. The Tanana River is a major tributary of the Yukon River and drains an area covering approximately 20,500 square miles (Liljedahl et al. 2017).

Upstream reaches of the Delta River, totaling 62 miles, are designated as a Wild, Scenic, and Recreational River under the National Wild and Scenic River (NWSR) Act (16 USC 1271 et seq.). These reaches are outside the boundaries of Fort Greely (BLM 2020). Public access to the Delta River and Jarvis Creek are not provided in the boundaries of Fort Greely.

Neither the Delta River nor Jarvis Creek are used as a source of drinking water at Fort Greely. There are no other naturally occurring surface waterbodies in the Fort Greely cantonment area.

3.3.2.2 Water Quality

There are over 714,000 miles of rivers and streams in Alaska. The State of Alaska establishes and enforces water quality standards to support the use of surface waterbodies for recreation (e.g., swimming), consumption of fish, propagation of aquatic life and habitat, drinking water supply, and aquaculture (USEPA 2020f). In accordance with Section 303(d) of the CWA, surface waterbodies in Alaska that do not meet one or more water quality standards are considered "impaired."

As of 2018, less than 0.005 percent of Alaska's river- and stream-miles were considered impaired for one or more of the uses described above (USEPA 2020). Neither the Delta River nor Jarvis Creek are designated as impaired by the State of Alaska. The closest impaired waters to Fort Greely are reaches of Moose Creek, Noyes Slough, and Goldstream Creek; all are tributaries of the Tanana River that are more than 60 miles (in a direct line) downstream of Fort Greely (ADEC 2020d).

3.3.2.3 Groundwater

Groundwater underlying Fort Greely occurs approximately 175 to 200 feet below ground surface (bgs). The groundwater table underlies layers of permafrost that vary from 12 to 150 feet bgs. Runoff from the Alaska Range supplies most of the recharge to the aquifer underlying Fort Greely. Groundwater recharge in the area has been estimated at 1 inch per year (USACE 2020a).

Fort Greely has five active water supply wells. The suction depths of these wells vary from 155 to 350 feet bgs. Near SM-1A, the groundwater table is approximately 200 feet bgs and water supply is drawn from approximately 300 to 330 feet bgs (U.S. Army 1971). There are no sole source aquifers in Alaska (USEPA 2020e).

Three deactivated wells at Fort Greely are associated with the former operation of SM-1A (**Figure 1.2-2**). Supply Wells No. 11 (**Photo 6**) and No. 12 provided cooling water for the reactor when it was operational. Treated primary coolant water from SM-1A that met

radiological release criteria was discharged to Recharge Well No. 13 (also referred to as the “dry well”). Supply Well No. 11 is immediately north of Building 606 North inside the SM-1A perimeter fence. Supply Well No. 12 and Recharge Well No. 13 are outside the SM-1A perimeter fence approximately 300 feet north and 630 feet northeast of Building 606 North, respectively.

3.3.2.4 Stormwater

Stormwater generated on Fort Greely (including snowmelt) is conveyed through a network of inlets, pipes, swales, and human-made and naturally occurring ditches; it is discharged to the Delta River and Jarvis Creek. Fort Greely discharges stormwater in accordance with a Multi-Sector General Permit (MSGP) issued by ADEC under the authority granted by the National Pollutant Discharge Elimination System (NPDES) program administered by USEPA. Requirements of coverage under the MSGP include:

- Eliminating the discharge of process wastewater, domestic wastewater, and non-contact cooling water to stormwater drainage systems
- Implementing BMPs that identify the source, or sources, of water pollution and eliminate or reduce stormwater pollutants
- Preventing violations of surface water quality, groundwater quality, and sediment management standards

In accordance with the MSGP permit requirements, Fort Greely adheres to an installation-wide Stormwater Pollution Prevention Plan (SWPPP) that identifies existing and potential stormwater pollutants; areas of the installation where such pollutants are known or have the potential to originate; and measures to prevent or minimize the introduction of pollutants to stormwater runoff. The SWPPP is amended whenever a change in the design, construction, operation, or maintenance of facilities and infrastructure occurs on the installation (Fort Greely 2018).

To manage the quality and quantity of stormwater discharged from construction sites in Alaska, construction activities disturbing one or more acres are required to obtain coverage under the 2016 Construction General Permit (CGP) for Storm Water Discharges for Large and Small Construction Activities (Permit No. AKR100000). Coverage under the permit requires implementation of applicable erosion and sediment control measures to minimize erosion of exposed soils and concentrations of sediments and pollutants in stormwater discharged from the site (ADEC 2020c). Contractors are required to prepare and implement a site-specific SWPPP as a condition of obtaining and maintaining coverage under the CGP.

3.3.3 Environmental Consequences

This section discusses potential impacts on water resources in the ROI from the No Action and Proposed Action Alternatives. Impact significance thresholds used for this analysis are presented in **Table 3.3-2**.

Table 3.3-2: Water Resources Impact Significance Thresholds

Impact Significance Threshold	Impact Significance Threshold Definition
Less-than-significant adverse impact	The alternative would potentially have temporary adverse impacts on water resources, such as degradation of water quality, changes in flow patterns, or availability of water resources. Such impacts could be prevented, minimized or compensated for through adherence to applicable BMPs, permitting requirements, or other minimization measures.
Potentially significant adverse impact	The alternative would have permanent impacts on water resources that could not be prevented, minimized, or compensated for through adherence to applicable BMPs, permitting requirements, or other minimization measures.

Notes:

BMP = best management practice(s)

3.3.3.1 No Action Alternative

Under the No Action Alternative, SM-1A would continue to be maintained in a SAFSTOR condition. This would have no effect on water resources in the ROI.

3.3.3.2 Proposed Action Alternative

The Proposed Action Alternative would not involve channeling, diverting, altering, filling, or withdrawing water from surface waterbodies in the ROI; would have no potential to permanently affect water quality in receiving waterbodies; and would not contribute to the further degradation of water quality in downstream waterbodies designated as “impaired” by the State of Alaska. Activities and components of the Proposed Action Alternative would have no potential to be visible from or otherwise affect reaches of the Delta River upstream of Fort Greely that are designated as a NWSR, nor would they temporarily or permanently preclude access to any portion of the Delta River for recreation or other uses. Thus, the Proposed Action Alternative would have no short-term or long-term impacts on surface waterbodies in the ROI.

Land-disturbing activities during the Proposed Action Alternative (e.g., soil excavation and backfill) would have the potential to disturb approximately 1.5 acres in SM-1A’s fenced perimeter. The quality and quantity of stormwater discharged from the SM-1A site during the Proposed Action Alternative would be managed through adherence to a site- and project-specific SWPPP that would be prepared as a condition of coverage under the CGP. Stormwater volumes that would be generated on and discharged from the SM-1A site during the Proposed Action Alternative would not be particularly large or unmanageable relative to other construction and demolition projects of similar scale and scope. Thus, short-term adverse effects on stormwater would be less-than-significant.

Contact water from decommissioning activities (e.g., wet saw cutting, power washing, decontamination) would be captured, containerized, characterized, and disposed of off-site in accordance with a site-specific liquid effluent monitoring plan that would be prepared as part of a project-specific Environmental Monitoring and Control program. Adherence to these measures (and those specified in the SWPPP and Spill Prevention, Control, and Countermeasure (SPCC) Plan during the Proposed Action Alternative) would minimize pollutant and sediment concentrations in runoff discharged from the SM-1A site to the extent practicable. This would minimize corresponding impacts on water

quality in receiving waterbodies (i.e., the Delta River and Jarvis Creek). In the context of the watersheds associated with Jarvis Creek and the Delta River, any runoff from the SM-1A site would be small and contribute negligibly to the degradation of water quality in those waterbodies. Surface waterbodies in the ROI would return to conditions resembling those that existed prior to the Proposed Action Alternative following the completion of the proposed decommissioning and dismantlement activities. Therefore, short-term adverse impacts on water quality from the Proposed Action Alternative would remain less-than-significant; there would be no long-term impacts on water quality.

Ground-disturbing activities associated with the Proposed Action Alternative, including subsurface foundation removal and excavation of soils, would not extend to depths that would interfere with groundwater flow or quality. Common dewatering methods would be used as necessary to remove water that accumulates in excavations or trenches (likely from snowmelt or permafrost seepage) on the SM-1A site. The Proposed Action Alternative would not involve the installation of new groundwater withdrawal wells or the injection of wastewater to groundwater wells. Inactive wells associated with the former operation of SM-1A (Supply Wells No. 11 and 12, and Recharge Well No. 13) would be decommissioned in accordance with applicable ADEC regulations and requirements set forth in 18 Alaska Administrative Code (AAC) 80.015(e) after associated pumps, pipes, and concrete structures are removed, characterized, and disposed of according to state and federal regulations. Therefore, there would be no adverse short-term impacts on groundwater.

Decommissioning of the inactive wells would have no effect on Fort Greely operations and would represent a beneficial long-term effect on groundwater management at Fort Greely. Restoration of the site following the removal of facilities and infrastructure associated with SM-1A would be expected to result in an improvement over existing stormwater management measures on the site, thereby resulting in a long-term beneficial effect.

3.3.4 Water Resources BMPs

The decommissioning contractor would implement the following BMPs during the Proposed Action Alternative to prevent or minimize adverse impacts on water resources in the ROI:

- As a condition of obtaining coverage under the CGP, prepare and adhere to a site-specific SWPPP to manage the quality and quantity of stormwater discharged from the SM-1A site.
- Capture, containerize, and characterize contact water and dispose of accordingly at permitted off-post facilities, in accordance with a site-specific liquid effluent monitoring plan that would be prepared as part of the project-specific Environmental Monitoring and Control program.
- Prepare and adhere to a project- and site-specific SPCC Plan.
- In accordance with the SPCC Plan, provide spill containment and cleanup kits in conspicuous and accessible locations throughout the site for use in the event of an unintended release of contaminants or regulated materials.

3.4 Socioeconomics and Environmental Justice

This section discusses existing socioeconomic conditions in the ROI and the Proposed Action’s potential impacts on socioeconomics and environmental justice communities.

Socioeconomics is the interaction of social and economic factors in a population and environment. It includes the broader population, economic activity, and housing values that could be affected by a proposed action.

Environmental justice is the “fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (USEPA 2020d). Environmental justice communities of concern (i.e., populations with unusually high concentrations of poverty or meaningfully greater concentrations of minorities) should not bear a disproportionate burden of harmful environmental consequences due to policies, programs, activities or standards, and should be considered in and involved with the environmental decision-making process.

The ROI for this analysis consists of Fort Greely and surrounding communities, including Deltana, Delta Junction, and Big Delta. Delta Junction is immediately north of Fort Greely at the junction of the Richardson Highway and the Alaska Highway. Deltana is approximately 10 miles east of Delta Junction along the Alaska Highway. Big Delta is approximately 10 miles north of Delta Junction along the Richardson Highway. For comparison, socioeconomic characteristics for the state of Alaska are provided in this section.

3.4.1 Regulatory Setting

Regulations and guidance relevant to socioeconomics and environmental justice are summarized in **Table 3.4-1**.

Table 3.4-1: Regulations and Guidance Applicable to Socioeconomics and Environmental Justice

Regulation/Guidance ¹	Description
EO 12898, <i>Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations</i> (1994)	Directs federal agencies to consider the potential adverse human health or environmental effects of their actions on minority and low-income populations.
EO 13045, <i>Protection of Children from Environmental Health Risks and Safety Risks</i> (1997)	Requires federal agencies to prioritize and address environmental risks that may disproportionately affect the health and safety of children.
CEQ Environmental Justice Guidance under NEPA (1997)	Provides guidance on the consideration of EJ in the NEPA process, and how to identify EJ populations. Establishes criteria for identifying minority and low-income populations in the general population or affected area.

Notes:

¹ This list includes the primary regulations and guidance that apply to this resource area; it is not meant to be comprehensive. Other regulatory requirements may also apply.

CEQ = Council on Environmental Quality
EJ = environmental justice

EO = Executive Order
NEPA = National Environmental Policy Act

3.4.2 Affected Environment

3.4.2.1 Socioeconomic Characteristics

Selected socioeconomic characteristics in the ROI are presented in **Table 3.4-2** and described below.

Table 3.4-2: Selected Socioeconomic Characteristics in the ROI

Geography	2018 Population	Median Household Income (\$)	Owner-occupied housing unit rate (%)	Median value of owner-occupied housing units (\$)	Unemployment Rate in Population 16 Years and Older (%)	Population Under 18 (%)	Population of Racial Minority ¹ (%)	Population Living below Poverty Threshold (%)
Big Delta	457	78,447	81.0	150,400	0.0	17.3	13.3	5.5
Delta Junction	1,053	75,833	60.3	218,300	9.2	28.9	6.3	12.6
Deltana	2,613	88,696	86.9	230,900	10.2	31.3	3.1	3.3
Fort Greely	161	40,375	N/A ²	N/A ²	N/A ²	29.8	44.1	0.0 ²
Alaska	738,516	74,346	65.6	276,100	6.8	24.9	28.2	10.9

Notes:

¹ Minority populations were calculated by subtracting the White population from the total population.

² On-post residential populations at Fort Greely consist of military personnel and civilian family members who occupy government-owned housing and do not have incomes below the poverty threshold.

N/A = not applicable

ROI = region of influence

Source: U.S. Census Bureau 2018

Population

The population in the ROI (4,284 residents) represents approximately 0.6 percent of Alaska's total population (738,516 residents) and reflects the sparsely populated, remote character of Fort Greely and surrounding communities. Of the four communities in the ROI, Fort Greely has the smallest population (161 residents). Between 2010 and 2018, Fort Greely experienced an approximately 70 percent decrease in population (from 539 residents to 161 residents), likely due to organizational changes and/or changes in the installation's military mission. Comparatively, the overall population in the ROI decreased by approximately 1.3 percent, while the state population grew 3.4 percent during the same period.

The percentage of the ROI population under 18 years old ranges from 17.3 percent to 31.3 percent, with Big Delta having the lowest percentage and Deltana having the largest. The percentage of Fort Greely's population under 18 years old (29.8) is similar to Delta Junction's (28.9 percent) and Deltana's (31.3 percent), and somewhat higher than the state as a whole (24.9 percent).

Housing

Delta Junction and the state of Alaska have comparable rates of owner-occupied housing units (60.3 percent and 65.6 percent, respectively), while Big Delta and Deltana have similar (and higher) rates (81.0 percent and 86.9 percent, respectively). In contrast, there are no owner-occupied units on Fort Greely, likely because residents are military personnel and civilian dependents occupying on-post, Government-owned housing. Housing values for owner-occupied units in the ROI range from \$150,400 to \$230,900. Housing values in the state as a whole are somewhat higher at \$276,100. Lower housing values in the ROI likely reflect the relatively small populations and correspondingly lower demand for housing in these communities.

Income and Employment

Median household incomes in Big Delta (\$78,447) and Delta Junction (\$75,833) are comparable, and higher than that of the state as a whole (\$74,346), while Deltana reports a somewhat higher median household income at \$88,696. Fort Greely's median household income (\$40,375) is notably lower than the state and other communities in the ROI.

The three employment industry categories with the highest rates of employment in the ROI are: 1) educational services / health care / social assistance; 2) public administration, and 3) retail trade. There is some seasonal variation in employment, with higher employment in the summer months. The ROI has a relatively high unemployment rate. While Fort Greely and Big Delta report a 0 percent unemployment rate, Delta Junction and Deltana, the two larger communities in the ROI, report 9.2 percent and 10.2 percent unemployment rates, respectively. These unemployment rates are substantially higher than that of the state (6.8 percent).

Community Services

There are four public schools in the ROI: Delta Elementary School, Delta Junior High School, Delta High School, and Delta/Greely Homeschool. Other community services present in the ROI include places of worship, post offices, retail stores, and gas stations.

3.4.2.2 Environmental Justice

Minority Populations

CEQ guidance identifies a “minority population” as one where the percentage of minorities, with respect to race, exceeds 50 percent, or where the percentage of minorities is meaningfully greater than in the general population of the larger surrounding area (CEQ 1997). While none of the communities in the ROI have minority populations exceeding 50 percent, Fort Greely's minority population (44 percent) is notably larger than that of Delta Junction (6.3 percent), Deltana (3.1 percent), and Big Delta (13.3 percent) (**Table 3.4-2**). In comparison, the state reports minorities as 28.2 percent of the total population. Therefore, Fort Greely's minority population represents an environmental justice community of concern in the ROI.

Low-Income Populations

The U.S. Census Bureau identifies a “poverty area” as one where 20 percent or more of the residents have incomes below the poverty threshold (U.S. Census Bureau 2016). An “extreme poverty area” is defined by the U.S. Census Bureau as one where 40 percent of residents or more are below the poverty level (Shapiro et al. 2015). No communities in the ROI meet the definition of a poverty area, as poverty rates range from 0 percent to 12.6 percent (**Table 3.4-2**).

3.4.3 Environmental Consequences

This section analyzes the potential socioeconomic and environmental justice impacts in the ROI from the No Action and Proposed Action Alternatives. Impact significance thresholds used for this analysis are presented in **Table 3.4-3**.

Table 3.4-3: Socioeconomics and Environmental Justice Impact Significance Thresholds

Impact Significance Threshold	Impact Significance Threshold Definition
Less-than-significant adverse impact	The alternative would cause changes to socioeconomic conditions in the ROI that would not substantially alter employment levels, housing supply, incomes, public services, or other socioeconomic factors. Socioeconomic effects would generally be temporary.
Potentially significant adverse impact	<ul style="list-style-type: none"> • The alternative would cause substantial temporary or permanent changes to socioeconomic conditions in the ROI, such as property values, demographic composition, local spending, tax base, employment levels, housing supply, or other socioeconomic factors. • The alternative would result in disproportionately adverse impacts on environmental justice communities of concern, or result in the displacement of these communities.

Notes:

ROI = region of influence

3.4.3.1 No Action Alternative

Under the No Action Alternative, SM-1A reactor facility would continue to be maintained in a SAFSTOR condition. This would have no adverse impacts on socioeconomic conditions, including environmental justice communities, in the ROI.

3.4.3.2 Proposed Action Alternative

Under the Proposed Action Alternative, it is anticipated that decommissioning activities would generate temporary construction- and demolition-related jobs (likely fewer than 50), some of which may be local. This would have a short-term, beneficial effect on local socioeconomic conditions, including employment and personal income. New jobs would encourage the spending of business and personal income generated during the 6-year decommissioning period, and would potentially result in an increase in temporary lodging or housing rentals in communities near Fort Greely. In addition, some revenues would be generated in the ROI from fees to dispose of C&D waste at local or regional landfills. Overall, however, the number of jobs supported by the Proposed Action Alternative would represent a small percentage of the regional labor force. Therefore, while the Proposed Action would have some short-term beneficial effects on socioeconomic conditions in the

ROI, these effects would be small. Due to the Proposed Action Alternative's intermittent and finite nature, there would be no long-term impacts on socioeconomics in the ROI.

Disturbance from dismantlement activities could have short-term, less-than-significant adverse impacts on residents and communities near SM-1A and Fort Greely. Temporary increases in dust, noise, and vibration at Fort Greely, and traffic through surrounding communities is expected under the Proposed Action Alternative. Decommissioning activities would be similar to other construction and demolition projects that periodically occur elsewhere on Fort Greely, and would not be particularly unusual or disruptive. Adherence to BMPs, and coordination with Fort Greely and local communities by USACE and the decommissioning contractor, would minimize impacts on residents and communities in the ROI to the extent practicable.

No impacts on children are anticipated to result from the Proposed Action Alternative. There are no schools or other facilities near SM-1A where unusually large concentrations of children would potentially be present. A fenced, secured perimeter would be maintained around SM-1A throughout the Proposed Action Alternative to prevent unauthorized access by children or other unauthorized persons. Decommissioning-related traffic (particularly heavy truck traffic) would primarily travel on major roads and would not be expected to regularly pass schools, neighborhoods, or other areas where large concentrations of children would be present.

Under the Proposed Action Alternative, no disproportionately adverse environmental justice impacts would be anticipated. Potential adverse impacts from fugitive dust and noise from the Proposed Action Alternative would primarily be confined to the SM-1A site and its immediate area, where no on-post residential populations are present. To the extent practicable, on-post decommissioning-related traffic would be routed to avoid residential areas, further preventing or minimizing potential impacts on environmental justice communities at Fort Greely.

3.4.4 Socioeconomics and Environmental Justice BMPs

USACE public engagement with local communities on and around Fort Greely is ongoing and will continue throughout the duration of the Proposed Action. A summary of USACE's public engagement conducted to date is provided in **Section 1.7**. Information regarding the Proposed Action, including an electronic version of this Draft EA, is also available on the USACE project website (<https://www.nab.usace.army.mil/SM-1A/>).

BMPs identified for other resources analyzed in this Draft EA would minimize potential adverse impacts on nearby on- and off-post communities, particularly from noise, air pollutant emissions, fugitive dust, traffic, waste, and safety and health. Adherence to these BMPs would ensure that potential impacts on environmental justice communities are not disproportionately adverse.

3.5 Biological Resources

This section discusses biological resources that could potentially be affected by the Proposed Action. The biological resources ROI is defined as the Fort Greely cantonment area. Biological resources addressed in this section include vegetation, wildlife and habitat, and protected species. Federally and state-listed rare, threatened, and

endangered species are not addressed in this Draft EA because the Proposed Action would have no potential effects (**Table 3.1-1**).

3.5.1 Regulatory Setting

Regulatory requirements applicable to the Proposed Action and biological resources in the ROI are summarized in **Table 3.5-1**.

Table 3.5-1: Regulations and Guidance Applicable to Biological Resources

Regulation/Guidance ¹	Description
Federal	
Sikes Act (16 USC § 670)	Requires federal military installations with adequate wildlife habitat to develop a long-range INRMP.
DOD/U.S. Army/Fort Greely	
AR 200-1, <i>Environmental Protection and Enhancement</i>	Implements federal, state, and local environmental laws and DOD policies for preserving, protecting, conserving, and restoring the quality of the environment.
Fort Greely 2017-2021 Draft INRMP	Establishes policies, requirements, and procedures for the management of natural resources at Fort Greely.

Notes:

¹ This list includes the primary regulations and guidance that apply to this resource area; it is not meant to be comprehensive. Other regulatory requirements may also apply.

AR = Army Regulation

DOD = Department of Defense

EIS = Environmental Impact Statement

INRMP = Integrated Natural Resource Management Plan

USC = United States Code

3.5.2 Affected Environment

3.5.2.1 Vegetation

Vegetation communities on Fort Greely are representative of interior boreal forest biomes. Common species occurring in interior boreal forests on Fort Greely include white spruce (*Picea glauca*), quaking aspen (*Populus tremuloides*), and paper birch (*Betula papyrifera*). A considerable amount of vegetation on Fort Greely is in the early regeneration stage due to a fire that occurred on the installation in 1999. Vegetation on the SM-1A site and in the Fort Greely cantonment area, which is extensively urbanized or otherwise developed, is generally limited to areas of grass (maintained lawn) and ornamental shrubs.

Fifteen non-native plant species have been documented on Fort Greely, of which only one species (bird vetch [*Vicia cracca*]) is considered highly invasive (HDR 2012a). The introduction and spread of invasive species is a concern at Fort Greely due to the amount of out-of-state cargo that arrives at the installation. Invasive species on Fort Greely are monitored and controlled in accordance with procedures set forth in the USAG Alaska INRMP (USAG Alaska 2017).

3.5.2.2 Wildlife and Habitat

Common wildlife species documented at Fort Greely include 13 mammal species, 1 amphibian species, and 52 bird species. No reptiles have been documented on the installation (HDR 2012b). Representative wildlife species documented on Fort Greely are listed in **Table 3.5-2**.

Table 3.5-2: Representative Wildlife Species Documented at Fort Greely

Common Name	Scientific Name	Common Name	Scientific Name
Mammals			
Moose	<i>Alces alces</i>	Porcupine	<i>Erethizon dorsatum</i>
Brown bear	<i>Ursus arctos horribilis</i>	Arctic ground squirrel	<i>Spermophilus parryii</i>
Coyote	<i>Canis latrans</i>	Red Squirrel	<i>Tamiasciurus hudsonicus</i>
Snowshoe hare	<i>Lepus americanus</i>	Meadow Vole	<i>Microtus pennsylvanicus</i>
Birds			
Dark-eyed junco	<i>Junco hyemalis</i>	White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Alder flycatcher	<i>Empidonax alnorum</i>	Cliff swallow	<i>Petrochelidon pyrrhonota</i>
Yellow-rumped warbler	<i>Setophaga coronata</i>	Mew gull	<i>Larus canus</i>
Hermit thrush	<i>Catharus guttatus</i>	Spruce grouse	<i>Falcapennis canadensis</i>
American robin	<i>Turdus migratorius</i>	Ruffed grouse	<i>Bonasa umbellus</i>
Common raven	<i>Corvus corax</i>	Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>
Amphibian			
Wood frog	<i>Rana sylvatica</i>		N/A

Notes:

N/A = not applicable

Source: USAG Alaska 2020b

Moose are frequently observed on Fort Greely, as their height enables them to clear fencing as much as 6 feet high. Fort Greely's perimeter fence, and other internal fences on the post, generally restrict the movement of other large terrestrial wildlife species.

Suitable mammal habitat in the cantonment area and at the SM-1A site is limited. Mammals likely to occur at SM-1A include squirrels, mice, and/or other small rodents that are adapted or conditioned to urbanized environments and a high degree of human activity. The wood frog, which requires wetland habitat, is not present at the SM-1A site.

Some bird species occurring at Fort Greely, such as cliff swallows, have a potential to nest under the eaves of buildings in the cantonment area. However, the SM-1A site has not been historically impacted with bird issues. Fort Greely has improved building exteriors with an environmentally friendly insulation system to discourage bird nesting.

3.5.3 Environmental Consequences

This section discusses the potential impacts on biological resources in the ROI from the No Action and Proposed Action Alternatives. Impact significance thresholds used for this analysis are presented in **Table 3.5-3**.

Table 3.5-3: Biological Resources Impact Significance Thresholds

Impact Significance Threshold	Impact Significance Threshold Definition
Less-than-significant adverse impact	<ul style="list-style-type: none"> • The alternative would result in a small temporary increase in injury and/or occasional mortality of vegetation/wildlife. • The alternative would result in a small temporary loss of wildlife habitat.
Potentially significant adverse impact	<ul style="list-style-type: none"> • The alternative would result in substantial wildlife mortality. • The alternative would result in substantial habitat loss.

3.5.3.1 No Action Alternative

Under the No Action Alternative, USACE would continue to maintain SM-1A in a SAFSTOR condition, and existing biological conditions at Fort Greely would continue. Therefore, no impacts on biological resources would occur.

3.5.3.2 Proposed Action Alternative

Under the Proposed Action Alternative, existing areas of grass (maintained lawn) and ornamental vegetation on the SM-1A site would be removed to facilitate the decommissioning and dismantlement of SM-1A; these areas would be small in the context of other vegetated areas of Fort Greely and the surrounding region. Although two trees would be removed on the southwest corner of the SM-1A site during implementation of the Proposed Action Alternative, no clearing would be required elsewhere on Fort Greely. Short-term adverse impacts on vegetation would be less-than-significant.

Temporarily disturbed areas would be reseeded with native grasses and/or shrubs during the Proposed Action Alternative's site restoration phase (**Table 2.2-1**) to promote revegetation of the site, prevent the introduction of non-native or invasive plant species, and prevent or minimize continued soil erosion. New or replanted vegetation on the site would be monitored and managed by Fort Greely in accordance with the installation's Draft INRMP. The Proposed Action Alternative would not involve the continued disturbance or removal of vegetation on the SM-1A site once the proposed decommissioning and dismantlement activities are complete. Therefore, there would be no long-term adverse impacts on vegetation.

The removal of structures and small areas of vegetation on the SM-1A site during implementation of the Proposed Action Alternative would potentially displace small species of wildlife and birds inhabiting those areas. Additionally, the increased levels of noise and human presence on the SM-1A site could disturb or cause annoyance to wildlife inhabiting adjacent or nearby areas of the cantonment area. The levels of additional noise and human activity at the SM-1A site would vary throughout the duration of the Proposed Action Alternative and would result in corresponding annoyance or disturbance reactions from nearby wildlife. Generally, the additional noise and activity on the site would be comparable to other projects of similar scale that occur on Fort Greely. It is likely that disturbed or displaced wildlife would relocate to other areas of the installation offering similar types of habitat. The available habitat on the SM-1A site that would be removed is of low quality and would be small in the context of habitat elsewhere on Fort Greely and in the surrounding area. Impacts would occur at the individual rather than population or species level and would not prevent the continued propagation of any species.

Increased traffic volumes associated with the Proposed Action Alternative would increase the potential for accidental collisions between vehicles and large mammals such as moose on the installation. To reduce the potential for such collisions, the decommissioning contractor would be briefed on the potential risk of collisions and would be required to adhere to posted speed limits and transportation routes. If determined necessary—particularly during the winter months when wildlife is more difficult to detect—spotter vehicles would be used to further minimize the risk of wildlife collisions.

The transportation of packaged waste by vessel from Alaska to one or more receiving ports in the contiguous 48 states would have no or negligible potential to affect marine resources. Waste would be packaged and transported in accordance with applicable regulatory requirements established by NRC, USDOT (including IMDG), USEPA, and the State of Alaska. The vessels would be operated by licensed commercial companies in accordance with applicable USDOT and U.S. Coast Guard operational and safety requirements. The vessels would follow established commercial navigation routes that would avoid sensitive environmental resources (e.g., critical habitat for federally listed species, marine sanctuaries, and fisheries). See additional discussion of marine shipping in **Section 3.7**.

USACE and/or the decommissioning contractor would coordinate with the Fort Greely Directorate of Public Works, Environmental Division, to determine the most appropriate course of action if an active MBTA-protected bird nest is observed on the SM-1A site. Any necessary nest relocation or removal would be conducted in accordance with policies and procedures set forth in the Fort Greely Draft INRMP. Therefore, short-term adverse impacts on wildlife and habitat would be less-than-significant.

Following completion of the Proposed Action Alternative, long-term wildlife and habitat conditions on the SM-1A site would be similar to existing conditions. Small wildlife species and/or birds that are conditioned to an urban environment and human activity could return to inhabit new vegetation on the site. The Proposed Action Alternative would have no potential to permanently prevent the propagation of any species. Therefore, there would be no long-term adverse impacts on wildlife and habitat.

3.5.4 Biological Resources BMPs

The decommissioning contractor would implement the following BMPs during the Proposed Action Alternative to prevent or minimize adverse impacts on biological resources in the ROI:

- Adhere to applicable policies and practices set forth in the Fort Greely Draft INRMP to prevent or minimize the introduction and spread of invasive plant species, such as only using certified weed-free seed mixtures during revegetation.
- Use spotters or escort vehicles as determined necessary, particularly during winter months when wildlife is more difficult to detect, to minimize the risk of collisions with moose or other wildlife during on-post vehicle operations (e.g., waste transport).

- Coordinate with the Fort Greely Directorate of Public Works, Environmental Division, to determine the most appropriate course of action if an active MBTA-protected bird nest is observed on the SM-1A site.

3.6 Air Quality

This section discusses existing air quality conditions and the Proposed Action's potential effects on air quality. The air quality ROI for this Draft EA is Fort Greely.

3.6.1 Regulatory Setting

3.6.1.1 National Ambient Air Quality Standards and Alaska Ambient Air Quality Standards

As directed by the CAA, the USEPA establishes National Ambient Air Quality Standards (NAAQS) to protect public health and welfare as outlined in 40 CFR 50. The CAA requires states to regulate air pollution emission sources to meet and maintain the NAAQS. The NAAQS establishes maximum acceptable concentrations for criteria pollutants that consist of nitrogen dioxide (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂), particulate matter with an aerodynamic diameter of 10 microns or less (PM₁₀), particulate matter with an aerodynamic diameter of 2.5 microns or less (PM_{2.5}), ozone, and lead. States are authorized by the CAA to establish their own ambient air quality standards, provided that the state standards are at least equivalent to the NAAQS.

The Alaska Ambient Air Quality Standards (AAAQS) are equivalent to or more stringent than the NAAQS (**Table 3.6-1**). In addition to setting Alaska-specific standards for criteria pollutants, the AAAQS also include a standard for ammonia. Air pollutant concentrations that are lower than the AAAQS provide public health protection, including protecting the health of sensitive populations such as asthmatics, children, and the elderly.

Table 3.6-1: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS (µg/m ³)	AAAQS (µg/m ³)	Form
CO	8-hour	10,000	10,000	Not to be exceeded more than once per year
	1-hour	40,000	40,000	Not to be exceeded more than once per year
NO ₂	Annual	100	100	Annual mean
	1-hour	188	188	98th percentile of annual distribution of the maximum daily 1-hour concentrations averaged over 3 years
PM _{2.5}	Annual	12	12	Annual mean, averaged over 3 years
	24-hour	35	35	98th percentile, averaged over 3 years
PM ₁₀	24-hour	150	150	Not to be exceeded more than once per year on average over 3 years
SO ₂	Annual	--	80	Not to be exceeded
	24-hour	--	365	Not to be exceeded more than once per year

Table 3.6-1: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS ($\mu\text{g}/\text{m}^3$)	AAAQS ($\mu\text{g}/\text{m}^3$)	Form
	3-hour	--	1,300	Not to be exceeded more than once per year
	1-hour	196	196	99th percentile of the annual distribution of the maximum daily 1-hour concentrations averaged over 3 years
Lead	Rolling 3-month average	0.15	0.15	Not to be exceeded
Ozone	8-hour	0.070 ppm	0.070 ppm	3-year average of the fourth-highest daily maximum of 8-hour averages not to exceed 0.070 ppm
Ammonia	8-hour	-	2.1 mg/m ³	Not to be exceeded more than once per year

Notes:

 $\mu\text{g}/\text{m}^3$ = microgram(s) per cubic meter

CO = carbon monoxide

AAAQS = Alaska Ambient Air Quality Standards

mg/m³ = milligrams per cubic meter

NAAQS = National Ambient Air Quality Standards

NO₂ = nitrogen dioxide

Sources: USEPA 2020c, 18 AAC 50

PM_{2.5} = particulate matter with an aerodynamic diameter of 2.5 microns or lessPM₁₀ = particulate matter with an aerodynamic diameter of 10 microns or less

ppm = parts per million

SO₂ = sulfur dioxide

Fort Greely is in a region designated by USEPA as unclassifiable and/or in attainment for all criteria pollutants regulated by the NAAQS. Therefore, a General Conformity Analysis of potential emissions from the Proposed Action is not required under the CAA General Conformity regulations. However, the Conformity Analysis emissions threshold value of 100 tons per year (tpy) is used in this Draft EA as a basis of comparison to analyze potential air quality impacts from the Proposed Action's estimated total emissions of criteria pollutants.

Sources of lead emissions in the region surrounding Fort Greely are minimal. SM-1A is not near any airfields where lead fuel is routinely combusted or where substantial lead emissions could occur. The Proposed Action would be anticipated to have no or minimal lead emissions. Therefore, ambient lead concentrations and comparisons to the lead AAAQS are not addressed further in this analysis. Additionally, evaluation of the ammonia AAAQS is not addressed further in this analysis because sources of ammonia in the region surrounding SM-1A and Fort Greely are minimal, and the Proposed Action would be anticipated to have no or minimal ammonia emissions.

Through the National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61), the CAA dictates specific regulatory limits for source categories that emit radionuclides. It is anticipated that potential emissions of radionuclides during the Proposed Action would remain well below applicable National Emission Standards for Hazardous Air Pollutant thresholds specified in the CAA. USACE would conduct an official regulatory review prior to implementation of the Proposed Action to determine applicable requirements.

3.6.1.2 Hazardous Air Pollutants and Greenhouse Gases

USEPA, state, and local governments regulate toxic and hazardous air pollutants (HAPs) such as benzene, asbestos, naphthalene, toluene, and xylenes. The USEPA has identified 188 HAPs that are known or suspected to cause health effects in small doses. HAPs are emitted by a wide range of human-made and naturally occurring sources, including mobile and stationary source combustion and venting. Given that HAPs emissions from the Proposed Action are anticipated to have no or minimal emissions, they are not quantitatively analyzed further. BMPs would be used to prevent or minimize HAPs emissions to the extent practicable. Pursuant to CAA Section 112, radionuclides such as radon, cesium-137, plutonium, and uranium are categorized as HAPs (USEPA 2020a). Radiological safety and health conditions at SM-1A, including radionuclides present at the facility, are further discussed in **Section 3.11**.

Greenhouse gases (GHGs) are compounds that contribute to the greenhouse effect. The greenhouse effect is a natural phenomenon where gases trap heat in the surface-troposphere (lowest portion of the earth's atmosphere) system, causing heating at the surface of the earth. The primary long-lived GHGs directly emitted by human activities are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). CO₂ and other GHGs are emitted from fuel-burning stationary sources (e.g., boilers, generators, plants, and factories), fuel-burning mobile sources (e.g., cars, buses, airplanes, trains, and construction equipment), and certain manufacturing industries and activities including leaked and vented gas (USEPA 2020b).

3.6.1.3 Title V Operating Permits

Under Title V of the CAA, operating permits are required for large stationary sources of emissions. Operating permits are issued either by the state or USEPA to large sources (also referred to as “major” sources) emitting 100 tpy of any criteria pollutant, or 10 or 25 tpy of any single or combination of HAPs, respectively, and to smaller sources (called “area” sources, “minor” sources, or “non-major” sources) that consist of certain types of industrial operations. Examples of sources that could be permitted under the Title V permit program include boilers, emergency generators, water heaters, fuel storage tanks, chemical usage operations, welding operations, woodworking, and fugitive emissions such as cooling towers and surface coating/paint booths.

Fort Greely currently maintains Title V permits for three major sources on the installation: the Missile Defense Complex (Permit No. AQ1071TVP03), Fort Greely Real Estate (Permit No. AQ0238TVP04), and Doyon Utilities (Permit No. AQ1183TVP03). Each permit regulates stationary source emissions under the specific operations and includes requirements for emissions monitoring, testing, recordkeeping, reporting, and inventorying on an annual basis.

3.6.2 Affected Environment

3.6.2.1 Regional Climate

Fort Greely is in central interior Alaska, which experiences seasonal extremes. The area is characterized by wide annual temperature ranges, short moderate summers, long cold

winters, large variations in seasonal sunlight periods, low humidity, and low precipitation. June through August are typically the wettest months with average precipitation of approximately 2 inches per month. October and November receive the most snowfall, with an average of approximately 9 inches per month (NOAA 2020). Overall, the area receives an average of 12 inches per year wet precipitation equivalent with 30 percent of that from snow. The average normal low temperature in January is -10 degrees Fahrenheit, with the average normal high temperature in July of 66 degrees Fahrenheit (NOAA 2020). The wind is the primarily the strongest during the winter months, with an average range in speed of about 8 to 12 miles per hour from the east-southeast (NOAA 2020). Wind direction from early fall to early spring follows the east-southeast orientation of the Tanana Valley and the southwestern orientation of the Delta River from May through July and are often associated with the calmest winds of the year. The maximum wind gusts tend to occur in the winter with gusts up to 65 miles per hour.

3.6.2.2 Existing Air Quality

As previously noted, the SM-1A site and Fort Greely are in an area designated by USEPA as unclassifiable and/or in attainment for criteria air pollutants regulated by the NAAQS and AAAQS under the CAA. Generally, air quality in Interior Alaska is very good (with the exception of PM_{2.5} pollution). The air quality region containing Fort Greely borders a nonattainment area for PM_{2.5}. Elevated PM_{2.5} pollution in the area primarily results from human sources, such as wood stoves, burning distillate oil, industrial sources, and mobile emissions, as well as smoke from summertime wildfires that vary in intensity and duration each season (i.e., April through September) (ADEC 2020b). Although elevated concentrations of PM_{2.5} could potentially occur at Fort Greely due to its proximity to the PM_{2.5} nonattainment area, this does not have an overall effect on the unclassifiable and/or in attainment designation for the air quality region that includes Fort Greely.

Principal sources of air pollution in the ROI include fuel combustion emissions from vehicles and equipment used to produce heat and electrical power for buildings. Pollutants emitted from mobile sources (e.g., automobiles and construction equipment) include hydrocarbons, carbon monoxide, nitrogen oxides, and particulates. HAP emissions in the ROI are primarily associated with permanent, stationary sources (e.g., fueling stations, fuel storage tanks, and paint booths). During cold weather, overall air quality impacts from motor vehicle emissions are intensified by the combination of emissions from cold vehicle starts / prolonged vehicle idling and the increased combustion of residential heating fuels. The principal natural sources of air pollution in the ROI are from wildfires and windblown dust. Smoke and soot from wildfires in and outside the ROI have the potential to contribute to increases in PM_{2.5} pollution and the corresponding degradation of local and regional air quality during the summer fire season; however, because these increases are seasonal and temporary, they are unlikely to require the redesignation of the ROI as a nonattainment area.

3.6.3 Environmental Consequences

This section discusses the effects on air quality in the ROI potentially resulting from the No Action and Proposed Action Alternatives. Thresholds used to determine the significance of potential impacts from the alternatives are presented in **Table 3.6-2**.

Table 3.6-2: Air Quality Impact Significance Thresholds

Impact Significance Threshold	Impact Significance Threshold Definition
Less-than-significant adverse impact	The alternative would result in a minimal and temporary impact on air quality in or near the ROI; however, such impacts could be minimized through adherence to applicable permitting requirements and BMPs. Impacts would cease upon the completion of activities associated with the alternative.
Potentially significant adverse impact	The alternative would result in a substantial or long-term impact on air quality in or near the ROI that could not be controlled or mitigated through adherence to applicable permitting requirements, BMPs, or other minimization or protection measures.

Notes:

BMP = best management practice(s)

ROI = region of influence

3.6.3.1 No Action Alternative

Under the No Action Alternative, SM-1A would continue to be maintained by USACE in a SAFSTOR condition and existing air quality conditions in the ROI would continue. Therefore, this alternative would have no impact on air quality in the ROI.

3.6.3.2 Proposed Action Alternative

Activities in the Proposed Action Alternative that would generate short-term pollutant emissions would include the following:

- Site preparation activities (e.g., clearing, grading)
- Handling and transport of excavated and imported materials (e.g., excavated soils, clean fill soils, concrete) during dismantlement activities
- Storage of excavated and imported materials in stockpiles (e.g., soils)
- Windblown dust from unpaved areas
- Off-site excavation and production of fill materials that would be used at the site during decommissioning (e.g., clean fill soils, concrete)
- Fuel combustion by decommissioning-related vehicles and equipment (e.g., workers' commuting vehicles, heavy-duty trucks delivering materials and equipment, and construction and demolition equipment)

Emissions generated by these activities would occur at the emission source and would generally remain localized to the SM-1A site except during strong wind conditions, thereby resulting in a localized impact.

Emissions from activities potentially generating fugitive dust (e.g., material hauling and transport, site preparation, stockpiles) were quantitatively assessed. It is anticipated that non-fugitive emissions during the Proposed Action (e.g., vehicle tailpipe, heavy duty trucks, and equipment) would be temporary and relatively small, resulting in only a slight increase of temporary emissions in the ROI. Additionally, some potential fugitive dust emission sources (e.g., off-site excavation of soil or fugitive dust from driving on paved roads) were not included in the estimates because the proposed activities would occur over a large area and result in a relatively small quantity of emissions. Using PM₁₀ as a conservative surrogate, estimated fugitive dust emissions from the Proposed Action are presented in **Table 3.6-3** by activity. Based on the emissions calculated in **Table 3.6-1**,

the project would not exceed the PM₁₀ threshold values of 100 tpy. Further details on the emission sources, such as the types and assumptions, are provided in **Appendix B**.

Table 3.6-3: Proposed Action Alternative Estimated Fugitive Dust Emissions

Source	Annual Estimated PM ₁₀ Emissions (tpy)	Total Estimated PM ₁₀ Emissions (tons)	PM ₁₀ <i>de minimis</i> Threshold Value (tpy)
Stockpile Fugitive Dust	0.03	0.14	100
Soil Export Fugitive Dust	1.40E-04	6.31E-04	100
Radioactive Soil Export Fugitive Dust	9.67E-05	4.35E-04	100
Soil Import Fugitive Dust	1.12E-04	5.02E-04	100
Wind Erosion from exposed areas	3.52E-02	0.16	100
Site Preparation Fugitive Dust	0.66	2.98	100
Building Demolition Fugitive Dust	0.04	0.04	100
Total Controlled Emissions	0.77	3.32	100

Notes:

PM₁₀ = particulate matter with an aerodynamic diameter of 10 microns or less

tpy = tons per year

It is anticipated that there would be no new sources of long-term operational emissions that would have the potential to contribute to the degradation or deterioration of local or regional ambient air quality, or require a new or modified Title V permit. If new stationary equipment is installed on the site in the future following the completion of the Proposed Action, it would be the responsibility of the proponent installing the equipment to either modify an existing permit or obtain a new one, as applicable.

Based on the quantitative and qualitative analyses of the estimated emissions, all criteria pollutant emissions (fugitive and non-fugitive) associated with the Proposed Action Alternative would have no potential to exceed applicable *de minimis* thresholds or alter the attainment status of the air quality region containing Fort Greely. Therefore, short-term adverse impacts on air quality in the ROI resulting from the Proposed Action Alternative would be less-than-significant, and there would be no long-term impacts.

3.6.4 Air Quality BMPs

The following BMPs would be implemented during the Proposed Action Alternative to prevent or minimize adverse air quality impacts in the ROI:

- Directly load (i.e., do not stockpile) radioactive waste and non-radioactive regulated solid waste into appropriate containers for transport
- Transport radioactive waste and non-radioactive regulated solid waste in closed containers meeting applicable regulatory requirements
- Cover payloads of C&D waste and backfill soils in trucks while in transit
- Periodically spray water on on-post paved and unpaved haul roads, as weather conditions allow
- Cover backfill soil stockpiles or periodically spray with water, as weather conditions allow

3.7 Transportation and Traffic

This section discusses the local and regional transportation network with regard to the Proposed Action. The ROI for the transportation analysis consists of on-post roads, regional off-post public roads and highways, and railroad lines that would potentially be used to transport waste generated by the Proposed Action.

3.7.1 Regulatory Setting

The Alaska Department of Transportation and Public Facilities (ADOT&PF) designs, constructs, operates and maintains the state's transportation infrastructure systems, buildings, and other facilities. ADOT&PF partners with the Alaska Railroad Corporation (ARRC) to facilitate rail transportation in accordance with the Alaska Railroad Corporation Act. ARRC owns, operates, and maintains rail lines throughout Alaska.

The transportation of radioactive materials is regulated jointly by the USDOT and the NRC. The Army does not regulate the transportation or disposal of radioactive materials.

Regulations and guidance that are applicable to transportation activities associated with the Proposed Action are summarized in **Table 3.7-1**.

Table 3.7-1: Regulations and Guidance Applicable to Transportation

Regulation/Guidance ¹	Description
Federal	
10 CFR 71, <i>Packaging and Transportation of Radioactive Material</i>	Establishes NRC requirements for packaging, preparation for shipment, and transportation of licensed radioactive material.
23 CFR 658, <i>Truck Size and Weight, Route Designations – Length, Width, and Weight Limitations</i>	Prescribes national policies that govern truck size and weight.
40 CFR 243, <i>Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste</i>	Establishes requirements for the storage and collection of residential, commercial, and institutional solid wastes and street wastes.
40 CFR Subchapter I, <i>Solid Waste</i> Parts 260-270	Establishes USEPA requirements for the generation, management, transportation, and disposal of hazardous waste.
Toxic Substances Control Act of 1978 (15 USC 2601 et seq.; 40 CFR Subchapter R)	Authorizes USEPA to regulate the manufacture, processing, distribution, use, and disposal of certain chemicals and mixtures to protect human health and the environment.
49 CFR Subchapter C, <i>Hazardous Material Regulations</i>	Establishes USDOT regulations for the packaging and shipment of hazardous materials by public highway, rail, air, and vessels.
49 CFR 172, <i>Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans</i>	Establishes USDOT requirements for shipping papers, package marking, labeling, and transport vehicle placarding applicable to the shipment and transportation of hazardous materials, including Class 7 radioactive materials ² .
49 CFR 383, <i>Commercial Driver's License Standards; Requirements and Penalties</i>	Establishes commercial motor vehicle driver's license requirements.

Table 3.7-1: Regulations and Guidance Applicable to Transportation

Regulation/Guidance ¹	Description
49 CFR 397 Subpart D, <i>Routing of Class 7 (Radioactive) Materials</i>	Establishes requirements for the routing of Class 7 radioactive material for motor carriers and drivers and State routing designations.
IMDG Code	The IMDG Code is maintained and updated by the International Maritime Organization and governs the majority of shipments of hazardous materials by water. The IMDG Code is intended to provide for the safe transportation of hazardous materials by vessel, protect crew members, and prevent marine pollution. The IMDG Code includes requirements applicable to the transport of hazardous materials by sea (e.g., requirements for marine pollutants, freight container loading procedures, stowage and segregation, and other requirements applicable to shipboard safety and preservation of the marine environment) that are not covered by the United Nations Model Regulations. Implementation of the IMDG Code is mandatory in conjunction with governments' obligations under the International Convention for the Safety of Life at Sea and the International Convention for the Prevention of Pollution from Ships. The United States is signatory to these two conventions. The U.S. Hazardous Materials Regulations (49 CFR 100-185) authorizes the use of the IMDG Code as a means of compliance with the Hazardous Materials Regulations when at least one segment of transport involves sea transport (USDOT 2020).
State of Alaska	
17 AAC 25, <i>Transportation and Public Facilities</i>	Establishes requirements for the planning, design, construction, operation, maintenance, and use of the Alaska state highway system, including the transport of hazardous materials, hazardous substances, and hazardous waste (17 AAC 25.200); safe operation of commercial motor vehicles (17 AAC 25.210); and requirements for oversize/overweight vehicles (17 AAC 25.310 et seq.).
DOD/U.S. Army/Fort Greely	
DA-PAM 385-24, <i>The Army Radiation Safety Program</i>	Establishes Army safety procedures for the use, licensing, transportation, disposal, dosimetry, accident reporting, safety design, accountability of, and radiation exposure standards for ionizing and non-ionizing radiation sources.

Notes:

¹ This list includes the primary regulations and guidance that apply to this resource area; it is not meant to be comprehensive. Other regulatory requirements may also apply.

² Generally, Class 7 radioactive materials consist of an indispersible solid radioactive material or a sealed capsule containing radioactive material.

AAC = Alaska Administrative Code

CFR = Code of Federal Regulations

DA PAM = Department of the Army Pamphlet

DOD = Department of Defense

IMDG = International Maritime Dangerous Goods

NRC = Nuclear Regulatory Commission

TSCA = Toxic Substances Control Act

USDOT = United States Department of Transportation

USEPA = United States Environmental Protection

Agency

3.7.2 Affected Environment

3.7.2.1 Fort Greely

The vehicular transportation network on Fort Greely primarily consists of paved, two-lane roads laid out in a north-south and east-west grid pattern in the installation's intensively developed central cantonment area (**Figure 2.2-1**). Additional paved and unpaved roads extend from the central cantonment area to less intensively developed areas of Fort Greely. Parking for government and privately owned vehicles is generally provided in paved surface lots adjacent to or near respective buildings and facilities on the installation.

The majority of vehicular traffic accesses Fort Greely from Richardson Highway through a staffed access control point (ACP) along Big Delta Avenue on the west side of Fort Greely. It is likely that traffic volumes at the gate are heaviest on weekdays during peak morning and afternoon commuting times from 6:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m., respectively.

3.7.2.2 Regional Transportation Network

Regional access to Fort Greely is via the Richardson Highway. The Richardson Highway is a two-lane highway that generally runs in a north-south direction for approximately 366 miles from Fairbanks (approximately 95 miles northwest of Fort Greely) to Valdez (approximately 268 miles south of Fort Greely). The Richardson Highway is designated as Alaska Route 4 from Valdez to Delta Junction (immediately north of Fort Greely) and Alaska Route 2 from Delta Junction to Fairbanks. The Glenn Highway (Alaska Route 1) is a two-lane highway that serves as the primary east-west road between its intersection with Richardson Highway (approximately 153 miles south of Fort Greely) and Anchorage (approximately 232 miles southwest of Fort Greely). The Richardson Highway and Glenn Highway are maintained by ADOT&PF.

Estimated 2018 average annual daily traffic (AADT) volumes on local and regional off-post roads and highways are presented in **Table 3.7-2**.

Table 3.7-2: AADT Volume Estimates on Regional Off-Post Roads and Highways

Road Segment ¹	Approximate Distance (miles)	AADT Volume Estimate (2018)
Richardson Highway from Big Delta Avenue (milepoint 264.096) north to Sixth Street (milepoint 268.264) (Delta Junction)	4.0	1,737
Richardson Highway from Big Delta Avenue (milepoint 264.096) south to milepoint 252.279)	12.0	443
Richardson Highway from Sixth Street (milepoint 268.264) north to Alaska Highway (milepoint 268.950) (Delta Junction)	0.7	1,418
Richardson Highway from Kimball Street / U.S. Post Office entrance (milepoint 269.254) north to Jack Warren Road (milepoint 271.216) (Delta Junction)	2.0	2,664
Richardson Highway from Jack Warren Road (milepoint 271.216) (Delta Junction) north to Tanana River Bridge (milepoint 278.292) (Big Delta)	7.0	2,089
Richardson Highway from milepoint 349.721 north to milepoint 351.292 (North Pole)	2.0	12,886
Richardson Highway from milepoint 359.182 north to milepoint 361.164 (Fairbanks)	2.0	25,812
Glenn Highway from Richardson Highway intersection (milepoint 178.128) west to milepoint 179.653	1.5	1,849
Glenn Highway from milepoint 53.606 west to milepoint 70.478 (northeast of Wasilla)	17.0	1,650
Glenn Highway from milepoint 6.323 to milepoint 10.324 (northeast of central Anchorage)	4.0	60,767

Notes:

¹The road segments listed here were selected to provide representative AADT volume estimates in rural and urbanized areas along those roads.

AADT = average annual daily traffic

Source: ADOT&PF 2020b

As shown in **Table 3.7-2**, estimated AADT volumes on roads and highways in the vicinity of Fort Greely, Delta Junction, Fairbanks, and Anchorage are generally higher in areas that are more intensively urbanized, and lower in rural areas. These estimated AADT volumes are expected to be within the existing capacity of the respective roads listed in **Table 3.7-2**.

The State of Alaska limits the weight of transport vehicles in the spring months as the ground thaws to preclude damage to roadways. This limitation is in addition to the typical weight and size restrictions on the movement of vehicles over the state's highways (or rail lines). Overweight/oversize highway permits are typically issued by ADOT&PF.

USDOT establishes the following maximum weights for the National System of Interstate and Defense Highways (23 CFR 658.17):

- 80,000 pounds gross vehicle weight
- 20,000 pounds single axle weight
- 34,000 pounds tandem axle weight

States may issue permits for loads that exceed the USDOT-specified weights listed above. ADOT&PF issues overweight transportation permits for loads in excess of the following:

- 150,000 pounds gross vehicle weight
- 30,000 pounds for a single axle trailer
- 56,000 pounds for a tandem axle trailer
- 70,000 pounds for a tridem axle trailer
- 80,000 pounds for a quadem axle trailer

3.7.2.3 Rail Network

The ARRC is a public/private partnership that maintains and operates 656 miles of freight and passenger railroad tracks and 681 freight revenue railcars that comprise the Alaska Railroad. The Alaska Railroad connects Fairbanks to ports and other communities throughout Southcentral and Interior Alaska, including Anchorage and Whittier (approximately 236 miles south-southwest of Fort Greely). In 2019, the railroad transported 3.49 million tons of freight, consisting of extracted natural resources such as coal, gravel and petroleum products; and commodities including industry chemicals and supplies, dry goods, hazardous materials, pipe, lumber, heavy equipment and specialty items (ARRC 2020).

3.7.2.4 Marine Ports and Shipping

The Port of Alaska in Anchorage and the Port of Whittier are commercial shipping ports serving Southcentral Alaska. Both ports are served by the ARRC. The Port of Alaska is designated as a DOD commercial strategic seaport. In 2018, the Port of Alaska handled approximately 3.9 million tons of cargo, including 174,000 tons of outbound cargo (Port of Alaska 2019). The ARRC coordinates commercial charter vessels at least once per week from the Port of Whittier to Seattle, Washington (ARRC 2019). Generally, cargo vessels depart the Port of Alaska or Whittier once per week for the 4-day trip to Seattle (USACE 2021b).

Cargo handling capabilities at the Port of Whittier include the loading of railcars directly onto vessels. Freight rail containers destined for shipment from the Port of Alaska must be transferred from trains to trucks at the rail yard prior to vessel loading. Representative types of vessels serving the Port of Alaska and Port of Whittier have a cargo capacity of approximately 15,300 tons (Alaska Marine Lines 2020). Vessels follow established commercial navigation routes.

3.7.3 Environmental Consequences

This section discusses the potential impacts on transportation in the ROI from the No Action and Proposed Action Alternatives. Impact significance thresholds for this analysis are presented in **Table 3.7-3**.

Table 3.7-3: Transportation Impact Significance Thresholds

Impact Significance Threshold	Impact Significance Threshold Definition
Less-than-significant adverse impact	<ul style="list-style-type: none"> • The alternative would result in a small temporary increase in peak hour traffic that could cause additional delays; however, the functionality of existing roadways would not change. • The alternative would result in minor damages to pavement; however, the damage would be localized and could be repaired easily. • The alternative would result in a negligible increased risk of a traffic accident and/or fatality.
Potentially significant adverse impact	<ul style="list-style-type: none"> • The alternative would result in a large temporary increase in peak hour traffic that would cause additional delays and decrease the functionality of existing roadways. • The alternative would result in severely damaged pavement requiring extensive repairs. • The alternative would substantially increase the risk of a traffic accident fatality occurring as a result of the project.

3.7.3.1 No Action Alternative

Under the No Action Alternative, SM-1A would continue to be maintained by USACE in a SAFSTOR condition. Current conditions would continue and there would be no impacts on transportation and traffic on or outside Fort Greely.

3.7.3.2 Proposed Action Alternative

Fort Greely and Regional Transportation Networks

The Proposed Action Alternative would generate additional vehicle traffic on Fort Greely, and on the Richardson Highway from Fort Greely to Fairbanks. Additional vehicle trips would include workers commuting to the project site, as well as heavy trucks hauling decommissioning-related materials and equipment, transporting waste from the SM-1A site, and bringing fill soils to the site during restoration activities.

The number of additional trips generated by workers commuting to the site is anticipated to be low. Workers' vehicles would enter and exit through the Big Delta Avenue ACP during morning and evening peak hours at approximately the same times as installation personnel. These additional vehicles could contribute to traffic congestion and delays, but effects would be anticipated to be minimal. The number of workers at the SM-1A site

would vary throughout the duration of the project and would be small relative to the number of DOD personnel commuting to Fort Greely on a daily basis. Effects would be minimal and would vary throughout the Proposed Action Alternative relative to the number of workers commuting to the SM-1A site each day. Therefore, short-term adverse impacts on traffic at Fort Greely from workers' commuting vehicles would be temporary and less-than-significant.

Shipments of waste from SM-1A would contribute to increases in traffic on on-post and off-post roads. Approximately 104 containers or truckloads of decommissioning waste would be shipped from Fort Greely during each shipping season (late spring to early fall) between 2023 and 2026 (**Section 2.2**). Assuming a 6-month shipping season between April and September, this would equate to approximately 17 containers or truckloads per month. These estimated monthly and seasonal numbers could vary substantially depending on decommissioning schedule, weather conditions, the availability of trained and qualified transportation contractors, and other factors.

On Fort Greely, it is likely that there would be a noticeable addition of truck trips to current traffic volumes. These additional trips could contribute to short traffic delays at the Big Delta Avenue ACP. Delays could occur throughout the project; however, in the context of vehicles entering and leaving Fort Greely on a daily basis, heavy truck traffic generated by the Proposed Action Alternative would represent a small increase and would remain within the capacity of the on-post road network, and not inconsistent with recent construction activities.

Outside Fort Greely, heavy truck traffic associated with the Proposed Action Alternative would primarily adhere to major roads and highways with sufficient capacity to handle these types of vehicles. Although truck traffic could be more noticeable in smaller communities with lower AADT volumes, it would represent a small proportion of all traffic. Truck traffic would have a negligible contribution to existing commercial truck traffic volumes in areas such as North Pole, Fairbanks, and Anchorage that have larger populations and higher traffic volumes. It is unlikely that truck traffic associated with the Proposed Action would measurably contribute to traffic congestion or delays on the Richardson Highway or Glenn Highway. While increased traffic volumes generated by the Proposed Action would be adverse, they would be distributed over approximately 4 years (2023-2026), variable, temporary, and consistent with truck traffic from similar types of construction and demolition projects in on-post and off-post areas. Therefore, short-term adverse impacts on on-post and off-post traffic and roads from heavy trucks would be less-than-significant.

Traffic generated by the Proposed Action—particularly heavy truck traffic—would have the potential to damage Fort Greely road surfaces and shoulders. In general, this damage would remain minor (e.g., potholes, crumbled shoulders) and be within the capacity of Fort Greely's road maintenance contractor to repair quickly and efficiently. USACE would coordinate with Fort Greely Directorate of Public Works (DPW) to identify and repair on-post road damage caused by decommissioning-related traffic in a timely manner. Therefore, the Proposed Action Alternative would have temporary, less-than-significant impacts on the road network at Fort Greely. Following completion of the Proposed Action, no new traffic would be generated by the former SM-1A site. On-post and off-post traffic

conditions would be similar to existing conditions. There would be no long-term impacts on roads and traffic.

It is anticipated that the majority of waste shipments from Fort Greely would remain below the State of Alaska's overweight transportation thresholds listed in **Section 3.7.2.2**. An exception could be the RPV, which is the most radioactive item remaining at SM-1A. The RPV would require shipment in a custom-fabricated container in accordance with 10 CFR 71 to provide the necessary radiation shielding and meet applicable external dose rate requirements. The combined weight of the RPV and its shipping container, not including the weight of the transport vehicle, would likely be approximately 60,000 to 80,000 pounds. USACE and its decommissioning contractor would coordinate overweight and/or oversize load permits, and obtain and adhere to the requirements of necessary state authorizations once the disposal site and transport routes are determined. The need for escort vehicles and/or additional security or public notification requirements would be assessed and implemented for waste shipments throughout the Proposed Action Alternative as applicable. Therefore, short-term impacts from the transport of oversize and/or overweight loads would be less-than-significant.

Containers with radioactive waste and/or non-radioactive regulated solid waste destined for disposal in the contiguous 48 states would be trucked from Fort Greely to Fairbanks and temporarily staged. From Fairbanks, waste containers would be transported along existing rail lines by the ARRC to the Port of Whittier or Port of Alaska for outbound shipping via vessel. Shipment of the waste containers would be primarily distributed over approximately 4 years (2023-2026) rather than occurring all at once, and as such would remain within the shipping capacity of the ARRC. Therefore, there would be no short-term adverse impacts on the capacity or operation of the ARRC.

Radioactive Waste Transportation

All radioactive waste generated by the Proposed Action Alternative would be packaged in accordance with applicable regulatory requirements established by NRC and USDOT (including IMDG). Radioactive waste packages would be transported by trained and qualified contractors to local or regional truck-to-rail transfer locations for shipping to the ultimate disposal facility in the contiguous 48 states.

The transport of any commodity involves a potential for risk to transportation personnel as well as the general public. Such risk is primarily associated with transportation-related accidents (e.g., injuries or fatalities from vehicle crashes), regardless of the cargo. The transport of certain materials, such as radioactive waste, can pose an additional risk due to the unique nature of the material itself (e.g., exposure to radiation emitted from a shipping container).

The contents of shipping packages containing radioactive materials must be contained and shielded during normal transport conditions in accordance with applicable NRC and USDOT regulations (10 CFR 71; 49 CFR Subchapter C). Packages containing radioactive waste have the potential to emit radiation even when properly shielded. Therefore, individuals encountering shipments of radioactive waste generated by the Proposed Action Alternative would have the potential to be exposed to radiation exceeding naturally occurring background radiation levels. These individuals could include transportation

workers (e.g., drivers, cargo handlers), residents living along the transport route, and other individuals who may come in proximity to the package during transport. Such exposure, depending on duration and intensity, could increase the risk of associated health problems, including cancer.

The GEIS on Decommissioning of Nuclear Facilities, Supplement 1 (NUREG-0586) (NRC 2002) determined that the potential impacts from transportation activities associated with the decommissioning of much larger nuclear facilities are neither detectable nor destabilizing when conducted in compliance with applicable regulations (NRC 2002). Similarly, the *Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes* (NUREG-0170) (NRC 1977) determined that risks to workers and the general public from radioactive material during transport are low when such material is packaged in accordance with applicable regulatory requirements. The transportation of radioactive waste generated by the Proposed Action Alternative would occur in a manner consistent with that analyzed by NRC. As such, short-term, adverse impacts on public and worker health from the transport of radioactive waste other waste from the SM-1A site during the Proposed Action Alternative would be less-than-significant.

No radioactive waste would be generated on the SM-1A site following completion of the Proposed Action Alternative. Therefore, there would be no long-term impacts from radioactive waste transportation.

3.7.3.3 Marine Ports and Shipping

Packaged waste generated by the Proposed Action Alternative would be loaded onto vessels at the Port of Alaska or Port of Whittier using existing facilities and capabilities. The waste would then be transported to one or more receiving ports along the West Coast of the contiguous 48 states (likely Seattle, Washington). Waste would be packaged in accordance with applicable regulatory requirements established by NRC, USDOT (including IMDG), USEPA, and the State of Alaska. The vessels would be operated by licensed commercial companies in accordance with applicable USDOT and U.S. Coast Guard operational and safety requirements. The vessels would follow established inshore navigation routes, which would avoid sensitive environmental resources or areas (e.g., critical habitat for federally listed species, marine sanctuaries, and fisheries). The specific vessel operators that would be used to transport the packaged waste would be identified and selected by USACE and its decommissioning contractor as project planning continues. Following arrival at the receiving port(s), the packaged waste would be transported by truck and/or train along established routes for ultimate disposal at one or more permitted facilities in the contiguous 48 states (**Section 2.2**).

Short-term impacts from the handling and transport by vessel of waste associated with the Proposed Action Alternative would be less-than-significant. The number of containers that would be shipped by the Proposed Action Alternative and transported to the contiguous 48 states by vessel would be minimal in the context of the cargo volume routinely handled by the Port of Alaska and Port of Whittier, the capacity of the receiving ports, and of representative vessels that serve those ports. Radioactive waste containers would be shipped in accordance with USDOT (including IMDG) regulations that limit radiation exposure to the public during transport. The transportation of radioactive and

other waste generated by the Proposed Action Alternative would occur in a manner consistent with that analyzed by NRC, and impacts would not exceed those analyzed by the NRC in the *Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes* (NUREG-0170) (NRC 1977) (**Section 1.8.1**).

The transport of radioactive waste and non-radioactive regulated solid waste by vessel would cease upon the completion of the proposed decommissioning activities. Therefore, the Proposed Action Alternative would have no long-term impacts from waste transportation by vessel.

3.7.4 Transportation BMPs

USACE and/or the decommissioning contractor would implement the following BMPs during the Proposed Action Alternative to prevent or minimize adverse impacts on the on- and off-post transportation network and from the transportation of waste in the ROI:

- Use trained and qualified contractors to transport waste in accordance with applicable federal and state regulatory requirements for disposal at permitted on-post and/or off-post facilities.
- Implement a transportation management plan that identifies approved on-post travel routes to and from the SM-1A site for heavy trucks transporting materials, equipment, and waste.
- Schedule decommissioning-related traffic (particularly heavy truck traffic) for off-peak hours when feasible and in coordination with Fort Greely and other affected organizations.
- Package and ship all radioactive and non-radioactive waste in accordance with the Waste Transportation and Disposal Plan, as well as applicable regulatory and permit requirements established by NRC, USDOT (including IMDG), USEPA, the State of Alaska, and other agencies.

3.8 Utilities

This section describes utility systems with regard to the Proposed Action. Utility systems include generation and distribution infrastructure for potable water, sanitary sewer and other wastewater, electricity, and data/communications. The ROI for utilities consists of utility systems and facilities on Fort Greely that would potentially be affected by the Proposed Action.

3.8.1 Regulatory Setting

Regulations and guidance applicable to utility systems on DOD installations are summarized in **Table 3.8-1**. Generally, the effective execution and support of the military mission on DOD installations such as Fort Greely is dependent on preventing disruptions to the utility generation and distribution networks serving the installation, or minimizing such disruptions to the extent possible.

Table 3.8-1: Regulations and Guidance Applicable to Utilities

Regulation/Guidance ¹	Description
Federal	
CWA (33 USC 1251 et seq.)	Establishes policies to ensure that drinking water is safe, and to restore and maintains oceans, watersheds, and their aquatic ecosystems to protect human health, support economic and recreational activities, and provide healthy habitat for fish, plants and wildlife.
SDWA (42 USC 6901 et seq.)	Authorizes USEPA to set national health-based standards for drinking water to protect against both naturally occurring and human-made contaminants that may be found in drinking water.
DOD/U.S. Army/Fort Greely	
AR 420-1, <i>Army Facilities Management</i>	Describes the management of public works activities, housing, and other facilities operations and management, including utilities services. Also contains the Army Energy and Water Management Program.
UFC 3-201-01, <i>Civil Engineering</i>	Provides civil engineering requirements for all new and renovated Government facilities for the DOD.
UFC 3-230-02, <i>Operation and Maintenance: Water Supply Systems</i>	Provides technical guidance for operating and maintaining potable water systems at fixed military installations.
UFC 3-430-02FA, <i>Central Steam Boiler Plants</i>	Offers guidance for the design of central steam plants for Army installations.
UFC 3-430-08N, <i>Central Heating Plants</i>	Presents the criteria used to govern the design of steam heating plants to ensure these plants operate in the most economical and environmentally manner possible.
UFC 3-430-09, <i>Exterior Mechanical Utility Distribution</i>	Provides criteria for the design of exterior distribution piping systems for various utility systems, including steam supply, chilled water, and cooling or condensing water.
UFC 3-501-01, <i>Electrical Engineering</i>	Provides the minimum electrical design requirements for all electrical work on all DOD installations, including upgrades and modifications to existing systems.
UFC 3-540-07, <i>Operation and Maintenance: Generators</i>	Provides guidance and standards for operating and maintaining standby, emergency, and prime power generators. Includes safety requirements, standard operating instructions, and test procedures.
UFC 3-550-01, <i>Exterior Electrical Power Distribution</i>	Describes policy and design standards related to electrical power and distribution systems. Serves as the minimum electrical design requirements for exterior electrical distribution systems.
UFC 3-550-07, <i>Operation and Maintenance: Exterior Power Distribution Systems</i>	Offers guidance for operations and maintenance of electrical power and distribution systems. Mandates that each installation establish a program for proper maintenance of its electrical distribution system.
UFC 3-560-01, <i>Operation and Maintenance: Electrical Safety</i>	Provides safety requirements and guidance for anyone working on or near electrical components.

Notes:

¹ This list includes the primary regulations and guidance that apply to this resource area; it is not meant to be comprehensive. Other regulatory requirements may also apply.

AR = Army Regulation

CWA = Clean Water Act

DOD = Department of Defense

SDWA = Safe Drinking Water Act

UFC = Unified Facilities Criteria

USC = United States Code

USEPA = United States Environmental Protection

Agency

3.8.2 Affected Environment

The SM-1A site is served by electrical, potable water and sewer, and data/communications systems that are part of Fort Greely’s overall utility network. Building 606 North contains communications equipment, electrical switchgear, battery charging stations, water softening systems, and backup treated boiler water associated with Fort Greely’s conventional utility systems. Building 606 South contains equipment and infrastructure associated with Fort Greely’s conventional utility system. Building J-5 is used for storage and is served with electrical power.

Electrical power, heating steam, and potable water produced at Buildings 606 North and 606 South are conveyed to other facilities on Fort Greely via aboveground and underground distribution networks (i.e., “utilidors”). Components of these aboveground and underground distribution networks are present on and under the SM-1A site.

From 1962 to 1968, treated reactor cooling water from SM-1A was discharged to Jarvis Creek in accordance with applicable licensing requirements that were in effect at that time. After 1968, reactor cooling water was discharged to Recharge Well No. 13 until SM-1A’s deactivation in 1972. Reactor cooling water discharge infrastructure outside the SM-1A perimeter fence was removed between 1997 and 1999 and documented in Record of Decision (USACE 2009). No further decommissioning activities are required in the Jarvis Creek area. An approximately 40-foot segment of abandoned piping associated with SM-1A’s original discharge system underlies the SM-1A site inside the fenced perimeter.

Groundwater wells associated with SM-1A are discussed in **Section 3.3**.

3.8.3 Environmental Consequences

This section discusses the potential impacts on utilities in the ROI from the No Action and Proposed Action Alternatives. Significance thresholds used for this analysis are presented in **Table 3.8-2**.

Table 3.8-2: Utilities Impact Significance Thresholds

Impact Significance Threshold	Impact Significance Threshold Definition
Less-than-significant adverse impact	The alternative could result in temporary utility service disruptions or shutoffs in the ROI during the relocation or removal of utility infrastructure on the SM-1A site. However, any disruptions would be planned and coordinated with potentially affected facilities, and utility services would resume in a timely manner and at previous capacity. There would be no long-term impacts on utility systems in the ROI.
Potentially significant adverse impact	The alternative could result in temporary or permanent utility service disruptions or shutoffs at Fort Greely during the relocation or removal of utility infrastructure on the SM-1A site. These disruptions could not be planned or foreseen, and would result in the disruption of operations at affected facilities. Utility services may not be restored in a timely manner or at previous capacity, resulting in a long-term adverse impact.

Notes:
ROI = region of influence

3.8.3.1 No Action Alternative

Under the No Action Alternative, SM-1A would continue to be maintained by USACE in a SAFSTOR condition. Current conditions would continue and there would be no impacts on utilities in the ROI.

3.8.3.2 Proposed Action

Prior to implementation of the Proposed Action Alternative, UP contractor operations, including personnel, materials, and equipment, would relocate from Building 606 North to Building 606 South, the temporary modular facility, and the permanent addition to Building 606 South. Additionally, aboveground and underground utility infrastructure associated with Building 606 North would be identified, disconnected, removed, relocated, or rerouted as necessary. These activities would ensure continuity of service to other facilities on Fort Greely, while preventing or minimizing health and safety risks to decommissioning workers and providing the necessary utility services to support decommissioning activities. It is anticipated that these activities would occur prior to the implementation of Phase 1 of the Proposed Action Alternative (**Section 2.2; Table 2.2-1**).

These activities would be planned and sequenced to avoid utility service disruptions to other facilities on Fort Greely that are served by systems in Buildings 606 North and 606 South. Once the Proposed Action Alternative has been implemented (i.e., Phase 1 and subsequent phases), temporary utility service disruptions to facilities outside the SM-1A site would be unlikely to occur. The removal of inactive or abandoned utility infrastructure underlying the SM-1A site would have no effects on utility systems or service at Fort Greely.

Following completion of the Proposed Action Alternative, utility systems and services at Fort Greely would be similar to existing conditions. There would be no degradation of utility systems, services, or capacity on the installation.

For these reasons, short-term adverse impacts on utilities from the Proposed Action Alternative would be less-than-significant. There would be no long-term impacts.

3.8.4 Utilities BMPs

The following BMPs would be implemented to prevent or minimize impacts on utilities from the Proposed Action Alternative:

- USACE would coordinate with potentially affected facilities regarding temporary planned utility service shutoffs or disruptions to prevent or minimize impacts on their operations.
- Temporary planned utility service shutoffs or disruptions would be sequenced or staggered to the extent practicable.

3.9 Soils

This section provides an overview of existing soil conditions and the regulatory setting pertaining to soil resources in the ROI. The ROI for this analysis consists of soils within the fenced perimeter of the SM-1A site and soils adjacent to the concrete utility corridor,

pipeline, and Well Nos. 11, 12, and 13 associated with SM-1A (contaminated soils stockpiled in the Demineralizer Room [**Section 2.2; Table 2.2-1**] are not addressed in this section). Soils as defined herein include unconsolidated particulates, organic matter, and material overlying the surface topography.

3.9.1 Regulatory Setting

Regulations and guidance that are applicable to the Proposed Action and soil resources in the ROI are summarized in **Table 3.9-1**.

Table 3.9-1: Regulations and Guidance Applicable to Soil Resources

Guidance/Regulation ¹	Description
Federal	
Farmland Protection Policy Act (7 USC 4201 et seq.)	Establishes regulations and requirements to prevent or minimize the unnecessary and irreversible conversion of farmland to non-agricultural uses.
CWA Section 402(p)	Regulates municipal and industrial stormwater discharges from non-point source discharges, including soil erosion, under the NPDES program.

Notes:

¹ This list includes the primary regulations and guidance that apply to this resource area; it is not meant to be comprehensive. Other regulatory requirements may also apply.

CWA = Clean Water Act

NPDES = National Pollutant Discharge Elimination System

USC = United States Code

3.9.2 Affected Environment

Soils in the ROI were derived from periods of glaciation and mountain building; soil parent material is primarily loess deposited over alluvium (NRCS 2005; USDA 2020). Soils at Fort Greely primarily consist of Nenana-Urban Land Complex and Nenana silt loam with relatively low erosional potential (USDA 2020). Soils tend to be flat, with slopes from 0 to 3 percent, and well-drained. A typical soil profile in Fort Greely may consist of roughly 0-2 inches of moderately decomposed plant material overlain on silt loam and gravely silt loam and sand (USDA 2020). Permafrost is known to exist in the surrounding area and in Fort Greely. Frozen ground has been measured to a maximum depth of 217 feet (USAG Alaska 2020b; Williams 1970).

Nenana silt loam soils are designated as soils of local importance in the Fairbanks Soil and Water Conservation District and the Greater Fairbanks, Tochaket, North Star, Fort Wainwright, and Greater Nenana soil survey areas (NRCS 2021). However, their location in Fort Greely constitutes an irreversible commitment to a non-agricultural land use. This precludes the formal designation of these land areas as federally or state-protected farmland.

Residual radioactive and non-radioactive contaminants are present in surface and subsurface soils adjacent to buildings and structures associated with SM-1A, including Building 606 North, Building J-5, and the utility corridor and pipeline associated with Well Nos. 11, 12, and 13. Non-radioactive contaminants (not connected to SM-1A's operation) primarily consist of petroleum residues from accidental spills or leaks that have previously

occurred within SM-1A’s fenced perimeter. Contaminated soils are further discussed in **Section 3.10**.

Structural concrete associated with Building 606 North and the VC extends to a depth of approximately 19 feet bgs. Soils underlying these structures are inaccessible and have not been sampled; however, they are suspected to be radiologically contaminated.

3.9.3 Environmental Consequences

This section discusses the potential impacts on soil resources in the ROI from the No Action and Proposed Action Alternatives. Impact significance thresholds used for this analysis are presented in **Table 3.9-2**.

Table 3.9-2: Soil Resources Impact Significance Thresholds

Impact Significance Threshold	Impact Significance Threshold Definition
Less-than-significant adverse impact	The alternative would have temporary or permanent impacts on soil resources from disturbance, excavation, backfilling, compaction, or similar activities. Such impacts could be avoided, compensated for, or minimized through adherence to applicable permitting requirements, BMPs, and other minimization or protection measures.
Potentially significant adverse impact	The alternative would have permanent impacts on soil resources from disturbance, excavation, backfilling, compaction, or similar activities. Such impacts could not be avoided, compensated for, or minimized through adherence to applicable permitting requirements, BMPs, or other minimization or protection measures; and/or would permanently prohibit the use of all or portions of soil resources in the vicinity of the SM-1A site.

Notes:

BMP = best management practice(s)

3.9.3.1 No Action Alternative

Under the No Action Alternative, SM-1A would continue to be maintained by USACE in a SAFSTOR condition. Low-level radioactive and non-radioactive contaminants associated with SM-1A would remain in soils on the site. While this would represent a long-term adverse effect, continued monitoring and management of these contaminants would ensure that the effect would remain less-than-significant.

3.9.3.2 Proposed Action Alternative

Impacts on soil resources from the Proposed Action Alternative would primarily result from excavation to dismantle and remove the primary components of SM-1A: Building 606 North, the VC, Building J-5, and their associated sub-grade foundational components; and the concrete utility corridor and pipeline associated with Well Nos. 11, 12, and 13. Approximately 1,681 cubic yards of soils (**Table 2.2-2**) would be excavated and removed during the Proposed Action Alternative. Soils would likely be over-excavated while removing clean cover soils and sub-grade structural materials (e.g., concrete building slabs and foundations) to maintain proper excavation safety, and dependent on safety protocols that are enacted (e.g. benching, structural reinforcement of excavation sides). Therefore, excavation depths and volumes may vary, based on the structure and contamination depth, and dependent on safety protocols that are implemented (e.g. benching, structurally reinforcing the sides of excavations). Waste soils

would be characterized and segregated at the point of excavation; it is currently anticipated that all contaminated soils excavated during the Proposed Action Alternative would require disposal as either radioactive waste or non-radioactive regulated solid waste at permitted facilities in the contiguous 48 states. Waste soils would be packaged accordingly and transported from Fort Greely by trained and qualified contractors. If feasible, non-contaminated soils would be stockpiled, verified as non-radiologically and non-chemically impacted, and used as backfill when acceptable.

Facility dismantlement and soil excavation would have some potential for temporary, localized adverse impacts on soil resources, such as an increased potential for erosion and sedimentation. Erosion and sedimentation of exposed soils would be minimized to the extent practicable through adherence to a project- and site-specific SWPPP that would be prepared by the decommissioning contractor and adhered to throughout the duration of the Proposed Action Alternative as a condition of coverage under the CGP (**Section 3.4**). Therefore, short-term adverse impacts on soils from the Proposed Action Alternative would be less-than-significant.

Following the removal of the primary SM-1A structures and components, an FSS would be conducted on the site to ensure remaining soils meet the unrestricted release criteria. Once achievement of the release criteria has been confirmed by an independent verification contractor, excavated areas of the SM-1A site would be backfilled with clean fill soils meeting applicable Fort Greely requirements, graded, and compacted to achieve positive drainage. It is anticipated that a greater volume of clean soil would be required for backfilling and restoration than the amount of waste soils excavated during the Proposed Action Alternative (1,681 cubic yards). Backfilled soil would be locally sourced from Fort Greely and/or off-post areas, and would meet applicable Fort Greely requirements for clean fill soil. Following backfill and grading, the site would be seeded with native grasses to prevent soil erosion.

Following completion of the Proposed Action Alternative, there would be no long-term impacts on soils at the former SM-1A site. The removal and disposal of impacted soils and restoration of the site with clean fill soils would have a beneficial effect on soils in the ROI.

3.9.4 Soil Resources BMPs

The following BMPs would be implemented during the Proposed Action Alternative to prevent or minimize adverse impacts on soil resources in the ROI:

- The decommissioning contractor would prepare and adhere to a project- and site-specific SWPPP as a condition of coverage under the CGP. Adherence to the SWPPP would manage the quantity and quality of stormwater discharged from the SM-1A site, prevent or minimize the migration of temporarily disturbed or stockpiled soils, and the corresponding sedimentation of receiving waterbodies.
- Soils excavated from the SM-1A site would be replaced with clean fill soils meeting applicable Fort Greely requirements.
- An environmental monitoring plan would be implemented and soil sampling would be conducted to support release of the site.

- An FSS would be conducted following the removal of the primary SM-1A structures and components to ensure remaining soils meet the unrestricted release criteria.
- Following backfill and grading, the site would be seeded with native grasses to prevent soil erosion.

3.10 Waste

This section describes radioactive and non-radioactive waste that would be generated by the Proposed Action; the ROI consists of buildings and infrastructure associated with SM-1A (Table 1.2-1), as well as applicable on- and off-post waste disposal facilities.

3.10.1 Regulatory Setting

Table 3.10-1 summarizes regulations and guidance that are applicable to waste as it relates to the Proposed Action.

Table 3.10-1: Regulations and Guidance Applicable to Waste

Regulation/Guidance ¹	Description
Federal	
RCRA (42 USC 6901 et seq.; 40 CFR Parts 260-268 and 270)	Establishes “cradle-to-grave” requirements for hazardous waste from its generation through transportation, treatment, storage, and disposal. RCRA Subtitle C regulations establish criteria for hazardous waste generators, transporters, and treatment, storage and disposal facilities, including permitting requirements, enforcement, and corrective action or cleanup. RCRA Subtitle D regulations ban open dumping of waste and set minimum federal criteria for the operation of municipal waste and industrial waste landfills.
Toxic Substances Control Act of 1978 (15 USC 2601 et seq.; 40 CFR Subchapter R)	Authorizes USEPA to regulate the manufacture, processing, distribution, use, and disposal of certain chemicals and mixtures to protect human health and the environment.
USEPA Asbestos Regulations (40 CFR 61, Subpart M; 40 CFR 763)	Regulations governing the use and emissions of asbestos.
10 CFR 61, <i>Licensing Requirements for Land Disposal of Radioactive Waste</i>	Establishes procedures, criteria, and terms and conditions upon which the NRC issues licenses for the disposal of radioactive wastes.
10 CFR 61.55, <i>Waste characterization</i> and 10 CFR 61.56, <i>Waste characteristics</i>	Regulates the classification, handling and disposal of radioactive waste.
40 CFR 273, <i>Standards for Universal Waste Management</i>	Establishes regulations for the management and disposal of universal waste.
USDOT Hazardous Material Regulations (49 CFR Subchapter C)	Regulations governing the transport of hazardous materials.
EO 13101, <i>Greening the Government through Waste Prevention, Recycling, and Federal Acquisition</i>	Strengthens and expands the federal government’s commitment to recycling and buying recycled-content and environmentally preferable products.
State of Alaska	
18 AAC 60, <i>Solid Waste Management</i>	Regulates solid waste management.

Table 3.10-1: Regulations and Guidance Applicable to Waste

Regulation/Guidance¹	Description
17 AAC 25.200, <i>Transportation of hazardous materials, hazardous substances, or hazardous waste</i>	Transport of Hazardous materials (State of Alaska adopts USDOT regulations by reference, as described in 49 CFR Subchapter C with some exceptions).
AS 18.60.450, <i>Asbestos</i>	Regulates asbestos-containing material to prevent release of asbestos fibers to the air or to surface water; regulates disposal to an approved landfill.
18 AAC 60.240, <i>Procedures to exclude receipt of hazardous waste</i>	Prohibits landfills from accepting PCB waste as defined in 40 CFR 761.3.
18 AAC 75, <i>Oil and Other Hazardous Substances Pollution Control</i>	Establishes requirements for the prevention, reporting, management, and cleanup of accidental spills of petroleum products.
DOD/U.S. Army/Fort Greely	
AR 200-1, <i>Environmental Protection and Enhancement</i>	Implements federal, state, and local environmental laws and DOD policies for preserving, protecting, conserving, and restoring the quality of the environment.
EM 1110-35-1, <i>Management Guidelines for Working with Radioactive and Mixed Waste</i>	Contains planning and management guidelines to be used for USACE work with radioactive waste, either alone or combined with hazardous or toxic components. Primarily describes regulatory and management responsibilities and their relation to the Technical Project Planning process and the Project Management Business Process applied to USACE activities at radioactive waste sites.
USACE SM-1A Reactor Facility Waste Management and Disposal Plan	Establishes procedures for the handling, management, and disposal/recycling of the various forms of waste that would be generated during the Proposed Action.
Fort Greely Integrated Solid Waste Management Plan	Examines the solid waste management parameters at Fort Greely Alaska; presents the operating scenarios that are available; considers the pollution prevention hierarchy of waste elimination/minimization, recycling, and disposal to select solid waste management schemes that are practical, compliant with regulatory requirements, and cost-effective.
Fort Greely Environmental Procedure, Chapter 2: Hazardous Materials and Hazardous Waste Management Procedure	Defines appropriate practices for transporting, storing and dispensing hazardous materials, as well as, collecting any resulting waste in a safe and controlled manner in accordance with applicable U.S. Army, installation, state and federal requirements.
Fort Greely Spill Notification and Response	Implements spill notification and response actions at Fort Greely.

Notes:

¹ This list includes the primary regulations and guidance that apply to this resource area; it is not meant to be comprehensive. Other regulatory requirements may also apply.

AAC = Alaska Administrative Code
 AR = Army Regulation
 AS = Alaska Statute
 CFR = Code of Federal Regulations
 DOD = Department of Transportation
 EM = Engineer Manual
 EO = Executive Order
 NRC = Nuclear Regulatory Commission

PCB = polychlorinated biphenyl
 RCRA = Resource Conservation and Recovery Act
 USACE = United States Army Corps of Engineers
 USC = United States Code
 USDOT = United States Department of Transportation
 USEPA = United States Environmental Protection Agency

3.10.2 Affected Environment

3.10.2.1 Non-Radioactive Regulated Materials and Solid Waste

For the purposes of discussion and analysis in this Draft EA, non-radioactive regulated materials and solid waste consist of materials and waste as defined in the federal statutes and regulations summarized below.

Hazardous materials are defined in the regulations of the USDOT Pipeline and Hazardous Materials Safety Administration (49 CFR 171.8) as “hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions” in 49 CFR 173.

Hazardous wastes are defined by RCRA in 42 USC 6903(5), as amended by the Hazardous and Solid Waste Amendments, as “a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (a) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.”

Universal wastes are a class of RCRA-regulated waste that are managed under regulations in 40 CFR 273. Universal wastes include batteries, fluorescent tubes, some electronic devices, pesticides, and other common items such as aerosol cans that may contain mercury, lead, cadmium, copper, and other hazardous substances or characteristics.

To protect human health and the environment, TSCA authorizes USEPA to regulate the manufacture, processing, distribution, use, and disposal of certain chemicals and mixtures. Materials commonly regulated by TSCA include ACM and PCBs. In waste form, these materials are not regulated under RCRA and therefore, by definition, are not hazardous wastes. TSCA wastes are regulated by USEPA under 40 CFR, Subchapter R (Parts 700 through 799).

Non-radioactive regulated materials and solid waste documented at SM-1A include those regulated under TSCA (e.g., ACM, PCBs), RCRA (e.g., LBP, lead bricks and sheets used as shielding), universal wastes, and polluted soils (regulated under ADEC). Locations and types of non-radioactive regulated materials and solid waste that have been documented at SM-1A are presented in **Table 3.10-2**.

Table 3.10-2: Existing Non-Radioactive Regulated Materials and Solid Waste at SM-1A

Material/Substance ¹	Location ¹	Source ¹
Asbestos (friable)	Building 606 North, Deaerator, exhaust stack	Primarily thermal system insulation, including cementitious, white pipe and boiler insulation, stack insulations, and turbine insulation
Asbestos (non-friable)	Building 606 North and Building J-5	Sealants and caulking compounds; window glazing; and transite and gypsum wallboards
Lead	Building 606 North, including waste tanks pit, fuel vault, VC, pipes; and surrounding soils	Lead shielding; lead acid batteries; lead-based paints; lead pipe and solder
PCBs	Building 606 North and the steam turbine generator	Paints; oils; caulking; and light ballasts
Mercury	Building 606 North, Building 606 North exterior, and Building J-5	Mercury vapor lighting; fluorescent bulbs; switches and thermostats

Notes:

¹ Information presented in this table is not comprehensive. Non-radioactive regulated materials and solid waste may be identified in other locations at SM-1A as decommissioning planning continues.

PCB = polychlorinated biphenyl

VC = Vapor Container

Source: USACE 2014

There are no disposal options for RCRA waste and most TSCA waste in Alaska; these wastes must be transported out of state for treatment and/or disposal at appropriately permitted facilities (**Section 2.2**). However, certain types of non-radioactive ACM may be disposed of in Alaska landfills that meet applicable permit requirements. Each landfill determines its own acceptance policy. The disposal of ACM in Alaska is regulated by ADEC. Facilities being considered by USACE for the disposal of non-radioactive ACM generated by the Proposed Action include:

- Fort Greely Landfill No. 8
- Delta Junction Landfill, approximately 9.4 miles north of Fort Greely
- Fairbanks North Star Borough Class I Landfill, approximately 83 miles northwest of Fort Greely

Some soils on the SM-1A site are contaminated with petroleum residues from accidental spills that have previously occurred on the site (not connected to SM-1A's operation). These spills were unrelated to the reactor's operation. Petroleum-contaminated soils are suspected to primarily be present near or adjacent to the northern and southeastern sides of Building J-5; however, the volume and extent of these contaminated soils has not been determined at the current stage of planning. Treatment and/or disposal of petroleum-contaminated soils is regulated by the ADEC Solid Waste Program. The remediation of petroleum-contaminated sites is managed by the ADEC Contaminated Sites Program.

3.10.2.2 Non-Hazardous Solid Waste

Non-hazardous solid wastes include (USEPA 2014):

- Garbage (e.g., milk cartons and coffee grounds)
- Refuse (e.g., metal scrap, wall board, and empty containers)

- Other discarded materials, including solid, semisolid, liquid, or contained gaseous materials resulting from industrial, commercial, and similar activities

MSW is a subset of solid waste and is defined as durable goods (e.g., appliances), nondurable goods (e.g., newspapers, books, magazines), containers and packaging, and miscellaneous organic wastes from residential, commercial, and industrial non-process sources. C&D waste typically consists of inert materials such as lumber, metal, roofing, bricks, drywall, insulation, and concrete (U.S. Army 2017).

As addressed in this Draft EA, non-hazardous solid waste includes MSW and C&D waste. Non-hazardous solid waste does not contain characteristics that are described in the definition of non-radioactive regulated solid waste presented in **Section 3.10.2.1**. Non-hazardous solid wastes can be disposed of in typical MSW and/or C&D waste landfills.

MSW and C&D waste generated on Fort Greely can be disposed of at the following on- and off-post facilities:

- Fort Greely Inert Waste Landfill: This 4.5-acre landfill is on Fort Greely (Landfill Road) and is permitted for the disposal of most C&D, inert materials, and non-regulated ACM (ADEC 2020a).
- City of Delta Junction Landfill: This landfill is in the city of Delta Junction and accepts C&D waste, such as wood, sheet rock, metal, and glass materials, and requires an application process. The 93-acre landfill is authorized to dispose of an annual average of less than 20 tons per day of domestic and commercial refuse, and also allows disposal of non-hazardous sewage sludge (State of Alaska Department of Environmental Conservation 2019).
- Fairbanks North Star Borough Solid Waste Facility: This landfill is on the south side of Fairbanks and accepts C&D wastes and MSW, as well as recycling. Full capacity of the MSW disposal area and the C&D disposal area is anticipated to be met in 2054 and 2023, respectively (Fairbanks North Star Borough DPW 2020).

Other permitted off-post disposal facilities in areas near Fort Greely may also be considered for disposal or recycling of MSW and C&D waste generated during the Proposed Action.

3.10.2.3 Radioactive Waste and Mixed Waste

SM-1A's highly radioactive nuclear fuel was removed during initial deactivation activities conducted in 1972-1973 (**Section 1.2.2**). Radioactive materials and residual radioactive contamination remaining at SM-1A are present in the VC (e.g., reactor equipment such as the RPV, steam generator, pumps), the spent fuel pit, waste tanks pit, Demineralizer Room, concrete foundation slabs of Buildings 606 North and J-5, and soils underlying and adjacent to those buildings. Once removed, dismantled, or excavated, these radioactive materials and radiologically contaminated soils would be considered radioactive waste.

It is anticipated that radioactive waste generated by the Proposed action would be classified as LLRW. LLRW is defined as radioactive waste not classified as high-level, spent fuel, transuranic, or byproduct material such as uranium mill tailings. LLRW is

further classified as Class A, Class B, or Class C waste based on potential risks from long-term disposal (10 CFR 61.55, *Waste classification*; 10 CFR 61.56, *Waste characteristics*). Class A LLRW requires the fewest long-term considerations for disposal and Class C requires the most. Requirements for the management and disposal of LLRW are established by the NRC.

LLRW generated during the Proposed Action would be anticipated to include the following:

- M&E (e.g., RPV and other reactor components in the VC, items encased in the spent fuel pit and waste tanks pit, steam turbine, deaerator)
- Structural materials (primarily concrete) from walls and/or floors/foundations of Building 606, the spent fuel pit, waste tanks pit, and VC
- The acrylamide grout-sand-soil mixture in the VC, spent fuel pit, and waste tanks pit
- Miscellaneous soils, debris, and equipment sealed in the Demineralizer Room
- Soils around Buildings 606 North and J-5

Mixed waste is defined as “a waste that contains both RCRA hazardous waste and source, special nuclear, or byproduct material subject to the Atomic Energy Act of 1954 as amended” (40 CFR 266.210). Mixed wastes may include radiologically contaminated soils that are also contaminated with petroleum contaminants or lead; radiologically contaminated lead shielding; or radiologically contaminated decontamination debris containing LBP residues. Waste regulated under TSCA (e.g., PCBs) that is also contaminated with radioactive material is managed as radioactive TSCA waste and disposed of in accordance with applicable regulatory requirements and the waste acceptance criteria of the disposal facility.

3.10.3 Environmental Consequences

This section discusses the potential impacts from radioactive and non-radioactive waste under the No Action and Proposed Action Alternatives. Impact significance thresholds used for this analysis are presented in **Table 3.10-3**.

Table 3.10-3: Waste Impact Significance Thresholds

Impact Significance Threshold	Impact Significance Threshold Definition
Less-than-significant adverse impact	The alternative would generate radioactive and non-radioactive waste; however, conditions or quantities of these wastes <i>would not exceed</i> USACE’s capacity to effectively manage and dispose of them.
Potentially significant adverse effect	The alternative would generate radioactive and non-radioactive waste such that conditions or quantities of these wastes <i>would exceed</i> USACE’s capacity to effectively manage and dispose of them.

Notes:
 USACE = United States Army Corps of Engineers

3.10.3.1 No Action Alternative

Under this alternative, USACE would continue to maintain and monitor SM-1A in a SAFSTOR condition. Radioactive materials and non-radioactive regulated materials associated with SM-1A would remain in buildings and structures on the site, resulting in an adverse impact. However, the continued monitoring and management of SM-1A in a SAFSTOR condition by USACE would ensure that adverse impacts from these materials remain less-than-significant.

3.10.3.2 Proposed Action Alternative

Estimated volumes of radioactive and non-radioactive waste that would be generated by the Proposed Action Alternative, and the number of trucks or containers required to transport waste from the SM-1A site for disposal, are summarized in **Table 3.10-4**.

Table 3.10-4: Estimated Waste Volumes and Trucks/Containers Required for Shipment

Waste Type	Estimated Waste Volume (cubic yards)	Estimated Number of Trucks or Containers
C&D waste	3,032	255
Radioactive Waste	2,969	250 ¹
Non-Radioactive Regulated Solid Waste	49	
TOTAL	6,050	505
Excavated Soils ¹	1,681	119

Note:

¹ Already included in the estimated radioactive waste volume and corresponding number of trucks/containers but listed separately to provide additional detail.

C&D = construction and demolition

Source: USACE 2021b

As shown in **Table 3.10-4**, C&D waste would represent approximately half of the waste generated during the Proposed Action Alternative. Non-radioactive regulated solid waste (49 cubic yards) would comprise less than 1 percent of the estimated waste. It is anticipated that most soils excavated on the SM-1A site during the Proposed Action would require disposal as radioactive waste and/or non-radioactive regulated solid waste at permitted facilities in the contiguous 48 states.

All waste would be segregated and characterized at the point of removal or excavation. Following characterization, radioactive waste and non-radioactive regulated solid waste would be immediately packaged on the SM-1A site (i.e., would not be stockpiled) and temporarily staged in accordance with applicable regulations at one or more areas on Fort Greely until ready for transport to the contiguous 48 states for disposal. Non-radioactive solid waste would be loaded into typical dump trucks or in end-dump roll-off containers, covered, and transported directly to on-post or off-post landfills or recycling facilities. Excavated soils determined to be contaminated with petroleum residues only (i.e., not radiologically contaminated) would be segregated, and USACE would coordinate with Fort Greely regarding their treatment and/or disposal. Radioactive waste and non-radioactive regulated solid waste would be packaged for temporary staging and transport

in accordance with applicable regulatory requirements established by NRC, USDOT (including IMDG), USEPA, and the State of Alaska; these wastes would ultimately be disposed of in permitted facilities in the contiguous 48 states. As applicable, all radioactive and non-radioactive wastes would be transported by trained and qualified contractors to permitted disposal facilities.

The estimated waste volumes presented above are based on previous site characterization surveys, professional knowledge and judgment of USACE and its consultants, the assumption that some waste volume reduction would be achieved through decontamination, and prior experience with similar decommissioning and dismantlement projects. Based on these estimates, it is expected that the volume of radioactive and non-radioactive waste generated during the Proposed Action Alternative would not exceed USACE's capacity to effectively manage and dispose of them. USACE and its decommissioning contractor would evaluate SM-1A waste streams throughout the Proposed Action Alternative for the safest and most effective disposal options available.

The dismantlement of buildings and infrastructure associated with SM-1A would result in short-term, less-than-significant adverse impacts from the generation radioactive and non-radioactive waste. The removal of radioactive waste and non-radioactive solid waste from SM-1A and their disposal at permitted off-post facilities would represent a beneficial effect in the long-term. Following the completion of the Proposed Action Alternative, no radioactive or non-radioactive wastes would be generated on the former SM-1A site; therefore, there would be no long-term adverse impacts.

3.10.4 Waste Management BMPs

USACE and/or the decommissioning contractor would implement the following BMPs to prevent or minimize potential impacts from waste generated during the Proposed Action Alternative:

- Prepare and adhere to a Hazardous Material Abatement Plan in accordance with Engineer Manual (EM) 385-1-1, *Safety and Health Requirements* to establish procedures for the management and disposition of non-radioactive regulated solid waste.
- Implement a Waste Management and Disposal Plan that would establish procedures and requirements for the safe management, handling, storage, and transportation of waste to optimize safety and prevent or minimize risks to the extent possible.
- Manage and dispose of regulated solid waste in accordance with applicable requirements established by USEPA through its enforcement of RCRA, TSCA and, where applicable, those established by ADEC.
- Prepare and adhere to a project- and site-specific SPCC Plan to prevent or minimize the potential for accidental spills of petroleum products or other regulated materials from decommissioning-related vehicles and equipment, and establish procedures for containing and cleaning up any spills that may occur.
- Provide spill containment and cleanup kits in conspicuous and accessible locations throughout the SM-1A site in accordance with the SPCC Plan for use in the event of an unintended release of regulated materials.

3.11 Safety and Health

USACE is committed to creating a safe working environment to ensure that potential risks to the health and safety of the public, workers, Fort Greely personnel, and on-post residents are eliminated or minimized to the greatest extent practicable throughout the duration of the Proposed Action. A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. Occupational safety and health programs address the health and safety of people at work. These programs impose regulatory requirements for the benefit of employees and the public, including implementation of engineering and administrative practices that aim to reduce risks of illness, injury, death, and property damage.

This section addresses radiological and non-radiological (i.e., industrial) safety and health applicable to the Proposed Action. The ROI for this analysis is the SM-1A site, adjacent and nearby areas of Fort Greely (including on-post transportation routes and temporary waste staging area), and areas that could reasonably be considered to have a likely environmental pathway for radiological exposure or contamination.

3.11.1 Regulatory Setting

Federal regulatory requirements addressing worker safety, protection, and health are administered and enforced by the Occupational Safety and Health Administration (OSHA). OSHA establishes worker protection standards that must be followed to prevent and minimize potential safety and health risks. In Alaska, state and federal laws and regulations pertaining to worker health and safety are administered and enforced by the Alaska Occupational Safety and Health Section of the Department of Labor and Workforce Development Labor Standards and Safety Division. Occupational safety and health regulations address potential worker exposure to a range of chemical, physical, and biological hazards and ergonomic stressors. These regulations are intended to control hazards by eliminating exposure via administrative or engineering controls, substitution, or use of personal protective equipment (PPE). EM 385-1-1 is the governing document for site safety on USACE project sites.

The Proposed Action is within the authorities granted to the DOD by the AEA. Specifically, Sections 91(b) and 110(b) of the AEA give DOD the authority to regulate radioactive materials at SM-1A. The Army's policy set forth in AR 50-7 is to follow NRC guidelines, as well as the recommendations of NCRP and ANSI. Policies and requirements set forth in DA-PAM 385-24 and EM 385-1-80, *Radiation Protection* are applicable to personnel and visitors at USACE work sites where radioactive material may be present.

Regulations and guidance applicable to safety and health with regard to the Proposed Action are summarized in **Table 3.11-1**.

Table 3.11-1: Regulations and Guidance Applicable to Safety and Health

Regulation/Guidance ¹	Description
Federal	
AEA Section 91(b) and Section 110(b)	Authorizes the DOD to possess special nuclear material for national defense purposes and excludes the DOD from licensing requirements for the manufacture, production, or acquisition of nuclear utilization facilities.
RCRA (42 USC 6901 et seq.; 40 CFR Parts 260-268 and 270)	Establishes training, safety, and emergency response requirements for the handling, management, and disposal of hazardous waste.
Toxic Substances Control Act of 1978 (15 USC 2601 et seq.; 40 CFR Subchapter R)	Establishes training, safety, and emergency response requirements for the handling, management, and disposal of specific chemicals, such as PCBs and asbestos.
10 CFR 20, <i>Standards for Protection against Radiation</i>	Regulates exposure to radiation to protect human safety and establishes federal guidelines and protection standards for any activities that are to be conducted under an NRC-issued License.
10 CFR 37, <i>Physical Protection of Category 1 and 2 Quantities of Radioactive Material</i>	Regulates and mandates additional requirements for the physical protection and security of higher quantities of radioactive materials referred to in the regulation as Category 1 or 2 quantities.
29 CFR 1910, <i>Occupational Safety and Health Standards</i>	Primary federal regulation that governs day-to-day workplace, or “general industry,” safety and applies to the extent that specific standards of the agricultural, construction, and maritime industries do not apply.
29 CFR 1926, <i>Safety and Health Regulations for Construction</i>	Establishes safety and health requirements to protect workers engaged in construction-related activities.
49 CFR, <i>Transportation</i>	Establishes regulatory training requirements for transportation-related activities, including hazardous and radioactive materials, and waste.
State of Alaska	
AS 18.60, <i>Safety</i>	Authorizes the Alaska Department of Labor and Workforce Development to establish programs to reduce the incidence of work-related accidents and health hazards in the state.
8 AAC 61, <i>Occupational Safety and Health</i>	Establishes occupational safety and health requirements for employers and workers in Alaska.
18 AAC 85, <i>Radiation Protection</i>	Establishes requirements for the possession, use, transport, and disposal of radioactive material in the State of Alaska.
DOD/U.S. Army	
AR 50-7, <i>Army Reactor Program</i>	Establishes Department of the Army policy to follow guidelines established by NRC regulations as well as the recommendations of the NCRP and ANSI.
Department of the Army Pamphlet 385-24, <i>Army Radiation Safety Program</i>	Establishes radiation safety procedures for activities, including decommissioning, for safe operations.
EM 385-1-80, <i>Radiation Protection</i>	Outlines Department of the Army policies and procedures for the handling of radioactive material and radiation generating devices at all USACE sites.
EM 385-1-1, <i>Safety and Health Requirements</i>	Prescribes safety and health requirements for all USACE activities and operations.

Notes:

¹ This list includes the primary regulations and guidance that apply to this resource area; it is not meant to be comprehensive. Other regulatory requirements may also apply.

AAC = Alaska Administrative Code

AEA = Atomic Energy Act

ANSI = American National Standards Institute

AR = Army Regulation

AS = Alaska Statute

CFR = Code of Federal Regulations

DOD = Department of Defense

EM = Engineer Manual

NCRP = National Council on Radiation Protection and Measurements

NRC = Nuclear Regulatory Commission

PCB = polychlorinated biphenyl

RCRA = Resource Conservation and Recovery Act

USACE = United States Army Corps of Engineers

USC = United States Code

3.11.2 Affected Environment

3.11.2.1 Non-Radiological Safety and Health

Health and safety hazards can often be identified and reduced or eliminated before an activity begins. Hazards at the SM-1A site could potentially occur from dismantlement, earthwork (e.g., excavation, filling, grading), decontamination, staging and loading, and confined space activities, as well as the creation of a noisy environment or fire hazards on or near the site. Any facility or human-use area with a potential explosive or rapid oxidation process would create unsafe environments for nearby populations. Noisy environments could also mask verbal or mechanical warning signals such as sirens, bells, or horns. The operation, maintenance, and repair of vehicles and equipment also present additional safety implications.

Physical, chemical, ergonomic, and biological hazards pose potential safety risks to workers involved in nuclear facility decommissioning activities. Examples of these hazards are discussed below. Based on current conditions at the SM-1A site as described in this EA and to varying degrees, all of the following occupational hazards would be present or have potential to occur during the Proposed Action.

Unless otherwise noted, information in the following subsections is drawn from the NRC's decommissioning GEIS (NRC 2002).

Physical Hazards

Slips, trips, and falls are some of the most common types of physical occupational hazards. Such incidents can occur when walking surfaces are slippery or uneven, when climbing or working on stairs and ladders, or when a worker's vision is obstructed due to dim lighting. Additional physical hazards could result from accidents involving vehicles and equipment; accidental ignition of flammable or combustible materials; excessive noise conditions; adverse reactions to temperature (heat or cold); and/or exposure to electricity (e.g., burns, electrocution).

Worker exposure to noise is regulated by a legally enforceable permissible exposure limit (PEL) of 90 A-weighted decibels (dBA) over the course of an 8-hour day. This PEL is a time-weighted average, meaning that the average noise exposure experienced by a worker calculated over an 8-hour day cannot exceed 90 dBA. For comparison, a conversational human speaking voice is approximately 60 dBA heard from 3 feet away (CDC 2018; U.S. Department of Labor 2019). Many types of commonly used construction tools and equipment exceed 60 dBA when heard from 50 feet away, including air compressors (81 dBA), backhoes (80 dBA), bulldozers (85 dBA), and jackhammers (88 dBA) (FHWA 2006).

Chemical Hazards

Chemicals and non-radioactive regulated materials and solid waste (**Section 3.10**) on the SM-1A site would pose a potential hazard to workers through incidental or accidental inhalation, dermal contact, or ingestion. Solvents and particulates would also pose a risk to worker health. Chemicals and substances in and around Building 606 North could

include ACM, PCBs, mercury, and the acrylamide grout mixture. In reactor facilities, these commonly occur in building materials, paints, light bulbs, light fixtures, switches, electrical components, and high-voltage cables. Other chemical hazards could include low levels of potassium, sodium chromate, and nickel, as well as quartz and cristobalite silica generated during concrete demolition. Fumes containing lead and arsenic, and smoke from flame cutting and welding are also sources of chemical exposure during decommissioning.

Ergonomic Hazards

Ergonomic hazards can result from the physiological and psychological demands of decommissioning work. Common indicators of ergonomic stress include discomfort and fatigue. These conditions can result in decreased performance, decreased safety, and increased chance of injury. Sources of ergonomic stress during decommissioning activities could include mechanical vibrations, lifting, and static work.

Biological Hazards

Biological hazards include viruses, bacteria, fungus, wildlife, or any organism that could potentially have adverse effects on human or environmental health. Biological hazards that may be present at the site include mold, mosquitoes, and wildlife, including moose and bear. Moose are frequently observed at Fort Greely and could present potential hazards to human health and safety (e.g., vehicle collisions, charging individuals due to a perceived threat). Wildlife hazards to humans are minimized at the SM-1A site by the existing perimeter fence.

3.11.2.2 Radiological Safety and Health

Current Radiological Conditions

The location and magnitude of radiological contamination at SM-1A have been well-defined through previous characterization surveys. Materials containing low levels of residual contamination at SM-1A are primarily limited to areas that are restricted or otherwise inaccessible to personnel and visitors on the site, including the VC, spent fuel pit, concrete foundation slabs, and underlying soils (**Section 3.10**). UP contractor personnel have access to unrestricted areas of Building 606 North and J-5 to operate equipment and infrastructure associated with Fort Greely's utility systems. Generally, Building 606 North has remained occupied by government personnel and/or contractors operating Fort Greely's utility systems since SM-1A's deactivation in 1972 (**Section 1.2.1**; **Section 1.2.2**).

The possession of radioactive materials by USACE at SM-1A is authorized by Deactivated Reactor Facility Possession Permit Number SM1A-1-19, Amendment 1-20. This permit authorizes the possession of byproduct materials, produced as a result of former SM-1A operations, present at the SM-1A site and at other locations where facility equipment or materials were used. USACE conducts regular inspections and environmental monitoring of SM-1A in accordance with AR 50-7 and the possession permit to ensure that exposure to residual radiation remains ALARA, but no more than 100 mrem per year to any member of the public; prevent unauthorized access to restricted

(i.e., radiologically contaminated) areas; prevent activities that could result in the release of airborne radioactivity that exceeds applicable permit thresholds; and meet other permit requirements (ARO 2020).

Radionuclides of concern (ROCs) documented in exterior areas of the SM-1A site (i.e., outside Buildings 606 North and J-5) are listed in **Table 3.11-2**. **Table 3.11-3** lists ROCs documented inside Buildings 606 North and J-5. Other ROCs that have not been detected in previous characterization efforts at SM-1A, but are likely present in activated metal and/or concrete materials, include carbon-14, iron-55, nickel-59, molybdenum-93, and niobium-94. These activation ROCs are present from the integration of stable elements in metals and concrete with neutrons generated in the reactor core; they will be considered in characterizing activated waste materials during decommissioning and dismantlement activities.

Table 3.11-2: Radionuclides of Concern for Soil and Exterior Paved Surfaces at SM-1A

ROC	Half-Life (ICRP 2008)	Source
Tritium (^3H) ¹	12.3 years	Fission
Cobalt-60 (^{60}Co)	5.27 years	Activation
Strontium-90 (^{90}Sr)	28.8 years	Fission
Technetium-99 (^{99}Tc) ¹	210,000 years	Fission
Cesium-137 (^{137}Cs)	30.2 years	Fission
Plutonium-238 (^{238}Pu)	87.7 years	Fuel
Plutonium-241 (^{241}Pu)	14.4 years	Fuel
Americium-241 (^{241}Am)	432.2 years	Fuel

Notes:

¹ Not detected at significant levels in soil outside the footprint of Building 606; may be present below the building and VC slabs

² Not detected in samples but should be considered present when ^{154}Eu is detected.

Not detected in outside soil; detected inside the VC and may be present below the VC slab.

ICRP = International Commission on Radiological Protection

ROC = radionuclide of concern

VC = Vapor Container

Source: USACE 2020a

Table 3.11-3: Building Surface and System Radionuclides of Concern

ROC	Half-Life (ICRP 2008)	Source	Locations Detected
Tritium (³ H) ^a	12.3 years	Activation / Fission (HTD)	V
Cobalt-60 (⁶⁰ Co)	5.27 years	Activation	V D B J
Nickel-63 (⁶³ Ni)	100.1 years	Activation (HTD)	V B
Strontium-90 (⁹⁰ Sr)	28.8 years	Fission	V D B J
Niobium-94 (⁹⁴ Nb)	2.03E+04 years	Fission	V J
Technetium-99 (⁹⁹ Tc)	2.11E+05 years	Fission	J
Cesium-137 (¹³⁷ Cs)	30.2 years	Fission	V D B J
Europium-152 (¹⁵² Eu) ^b	13.5 years	Activation	J
Europium-154 (¹⁵⁴ Eu)	8.6 years	Activation	J
Uranium-234 (²³⁴ U) ^b	2.45E+05 years	Reactor Fuel	B
Uranium-238 (²³⁸ U) ^b	4.47E+09 years	Reactor Fuel	B
Plutonium-238 (²³⁸ Pu) ^c	87.7 years	Reactor Fuel	V D B J
Plutonium-239/240 (^{239/240} Pu)	2.41E+04 years/6,564 years	Reactor Fuel	V J
Plutonium-241 (²⁴¹ Pu) ^c	14.4 years	Reactor Fuel	N/A
Americium-241 (²⁴¹ Am) ^b	432.2 years	Reactor Fuel	D J B

Notes:

^a Considered an ROC in uncharacterized areas such as the VC and the Demineralizer Room.

^b Not detected in samples but should be considered present when ¹⁵⁴Eu is detected.

^c Detected only in exterior soils but may be found in soils placed in encased areas or soil used during the mixing of the AM-9 grout.

ICRP = International Commission on Radiological Protection

HTD = Hard to detect low-energy beta emitter

N/A = not applicable; present in activated metals and concrete; not detected in samples

ROC = radionuclide of concern

Locations: V = VC, B = Building 606 North, D = Demineralizer Room, J = Building J-5

Source: USACE 2020a

The MARSSIM provides guidance for demonstrating compliance with dose or risk-based regulations after site remediation or decommissioning. Three classes of potential contamination are established by the MARSSIM, as defined below (NRC 2000):

- Class 1: Areas that have or had, prior to remediation, potential or known radioactive contamination above the applicable screening criteria.
- Class 2: Areas that have or have had prior to remediation, a potential for radioactive contamination or known contamination, but are not expected to exceed the screening criteria.
- Class 3: Impacted areas that are not expected to contain any residual radioactivity or only levels at a small fraction of the screening criteria.

MARSSIM classifications can generally be associated with both radiological and occupational risks to decommissioning workers. In Class 1 areas there is a higher potential for exposure to radioactive materials, as there is a higher potential for radioactive materials to be present above applicable screening criteria. To reduce contamination in a Class 1 area to levels that are below applicable screening criteria, industrial actions such as decontamination or selective demolition are typically required. Class 3 areas do not require such activities.

Figures 3.11-1 and **3.11-2** depict the MARSSIM classifications for the first and second floors of Building 606 North, and the VC interior. These classifications are based on site investigations conducted in 2011 and 2019. Class 1 areas include the VC; Demineralization (i.e., Demineralizer) Room, fuel vault, pipe pit, spent fuel pit, and condenser pit on the first floor; and the turbine area on the second floor. Access to Class 1 areas on the first floor is restricted in accordance with the requirements of the SM-1A reactor possession permit. The turbine area on the second floor is accessible because the Class 1 designation only applies to internally contaminated turbine components.

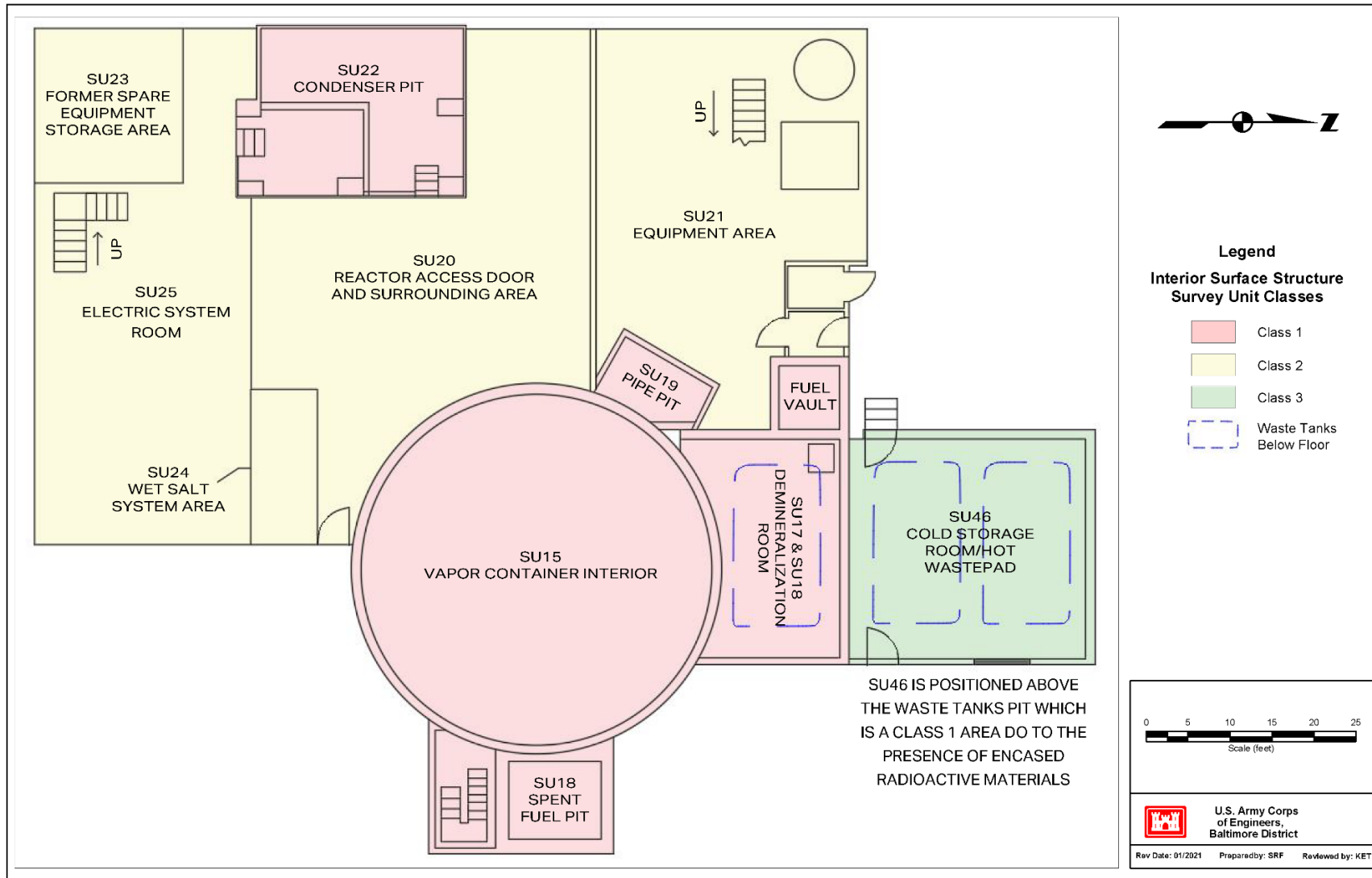
The rest of Building 606 North is categorized as Class 2 or 3. The corridor connecting Buildings 606 North and 606 South (not shown on **Figures 3.11-1** and **3.11-2**) is designated as Class 3. Access to these areas by UP contractor personnel and authorized visitors is generally unrestricted.

Potential for Accidental Releases

An accidental release of radiological material that impacts public health (i.e., one that exceeds applicable regulatory thresholds) is considerably more likely to occur at an operating reactor rather than one that has permanently ceased operations, such as SM-1A. Accidents that are likely to exceed applicable radiological regulatory thresholds can be categorized into 1) fuel-related accidents that generally involve the maintenance, storage, or movement of fuel, and 2) radioactive material-related (non-fuel) accidents, such as the management of high-activity waste (e.g., water treatment/demineralizer resins) (NRC, 2002). SM-1A's highly radioactive nuclear fuel and associated materials were removed during initial deactivation activities conducted in 1972-1973; therefore, there is no potential for an accidental release involving nuclear fuel at SM-1A.

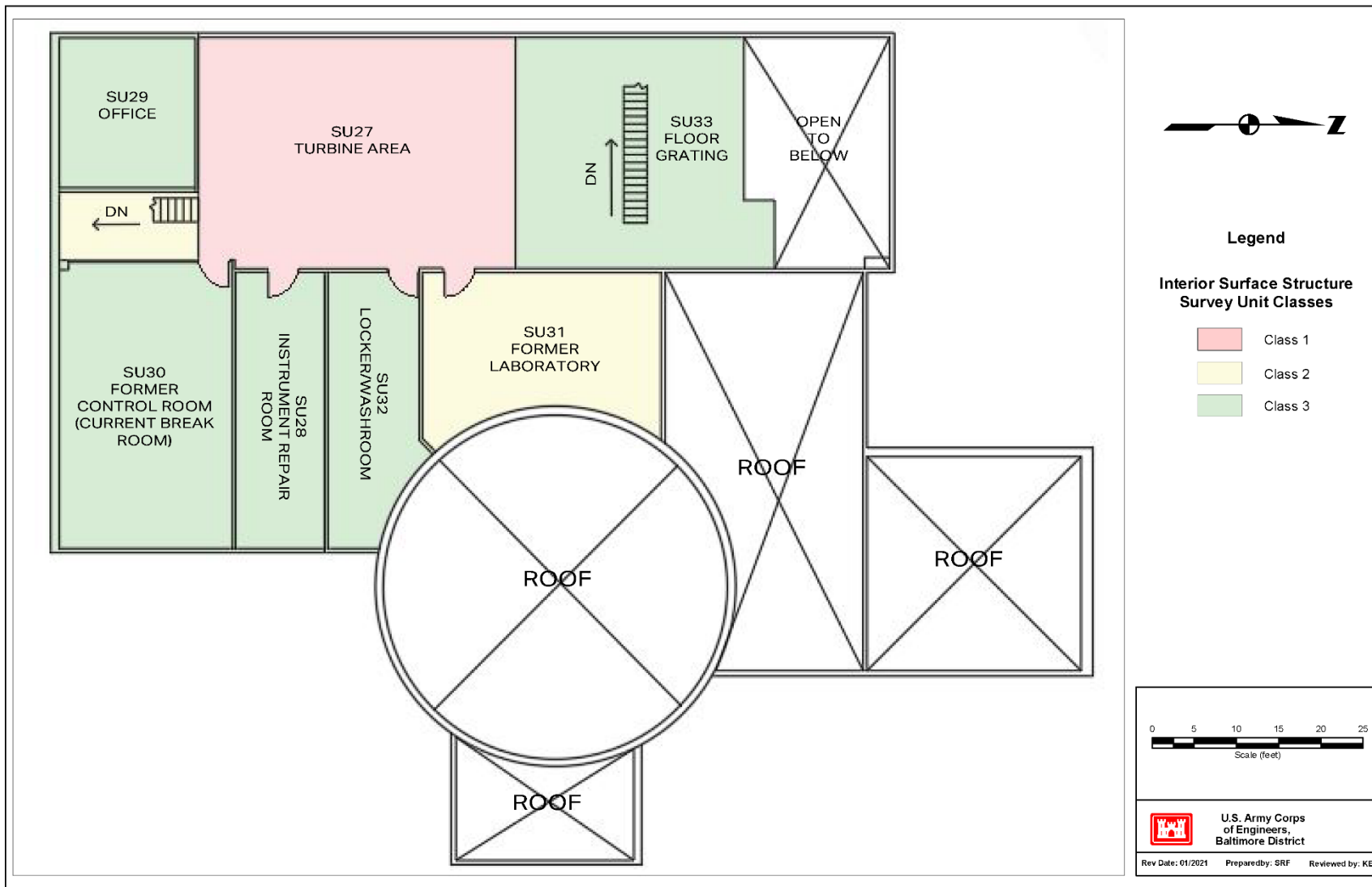
Accidental releases that could occur during the Proposed Action primarily consist of the release of airborne dust, particulates, or other small debris generated during decontamination or dismantlement activities. The primary ROC inside and outside Building 606 North, and the most likely to be released in an accident scenario, is cesium-137. Accidental releases of airborne dust or particles could potentially result in incidental inhalation, ingestion, short-term dermal contact, and/or external exposures.

Figure 3.11-1: MARSSIM Classification of First-Floor Interior Areas in Building 606 North



Source: USACE 2021b

Figure 3.11-2: MARSSIM Classification of Second-Floor Interior Areas in Building 606 North



Source: USACE 2021b

3.11.3 Environmental Consequences

This section describes the potential impacts on radiological and non-radiological safety and health in the ROI from the No Action and Proposed Action Alternatives. The impact significance thresholds used for this analysis are presented in **Table 3.11-4**.

Table 3.11-4: Radiological and Non-Radiological Safety and Health Impact Significance Thresholds

Impact Significance Threshold	Impact Significance Threshold Definition
Less-than-significant adverse impact	<ul style="list-style-type: none"> • The risk or potential for an OSHA-recordable injury¹ during the alternative would be minimized to the extent practicable through implementation of an occupational safety program and/or other applicable safety and health practices. • The risk or potential for an accident or emergency requiring response or treatment from on- or off-post fire and emergency services or emergency health care providers during the alternative would be minimized to the extent practicable through implementation of an occupational safety program and/or other applicable safety and health practices. • Occupational and public exposure to radiological contaminants would remain below applicable regulatory thresholds during the alternative. • The alternative would increase the probability of an accidental release of radioactive materials on or off site; however, any resulting exposure would remain at undetectable levels and would be minimized through safe work procedures and emergency plans.
Potentially significant adverse impact	<ul style="list-style-type: none"> • The risk or potential for an OSHA-recordable injury¹ during the alternative <i>could not</i> be minimized to the extent practicable through implementation of an occupational safety program and/or other applicable safety and health practices. • The risk or potential for an accident or emergency requiring response or treatment from on- or off-post fire and emergency services or emergency health care providers during the alternative <i>could not</i> be minimized to the extent practicable through implementation of an occupational safety program and/or other applicable safety and health practices. • Occupational and public exposure to radiological contaminants would exceed applicable regulatory thresholds during the alternative. • The alternative could increase the probability of a radiological accident that could result in detectable levels of on- or off-site release.

Note:

¹ An OSHA-recordable injury is defined in 29 CFR 1904.7 as one that results in any of the following: death, days away from work, restricted work or transfer to another job, medical treatment beyond first aid, or loss of consciousness.

OSHA = Occupational Safety and Health Administration

3.11.3.1 No Action Alternative

Under the No Action Alternative, SM-1A would continue to be maintained in a SAFSTOR condition and existing radiological and non-radiological safety and health conditions at the SM-1A site would continue. Through continued monitoring and maintenance of SM-1A in SAFSTOR condition, the risk of exposure to residual radioactivity and potential for non-radiological accidents or injuries on the site would remain small. Therefore, the No Action Alternative would have no short-term or long-term impacts on radiological and non-radiological safety and health.

3.11.3.2 Proposed Action Alternative

Non-Radiological Safety and Health

Under the Proposed Action Alternative, decommissioning and dismantlement activities would entail inherent occupational work hazards including physical, ergonomic, biological, radiological, and chemical hazards. The risk and potential severity of occupational hazards would vary throughout the duration of the Proposed Action Alternative relative to the particular tasks being performed at any given time. To prevent or minimize occupational safety risks to the extent practicable, USACE and the decommissioning contractor would implement an Industrial Safety Program to establish safety and health procedures, practices, and the use of PPE to protect personnel from potential occupational hazards associated with decommissioning activities and exposure to hazardous materials. The proposed activities would be performed in accordance with applicable federal, state, and local government regulatory requirements pertaining to occupational health, including OSHA standards in 29 CFR 1910.120 and 1926.65 regarding hazardous waste operations and emergency response. In the event of a conflict between federal, state, and local regulations, workers would adhere to the most stringent/protective requirements. The proposed activities would also adhere to the applicable requirements of EM 385-1-1.

The decommissioning contractor would implement a site- and project-specific accident prevention plan (APP) in accordance with the requirements of EM 385-1-1. The APP would describe the specific work, work processes, equipment to be used, and hazards pertaining to the decommissioning activities. The APP would contain appropriate hazard-specific plans for the work being performed (e.g., plans for working with lead, or an Asbestos Hazard Abatement Plan when working with asbestos). The APP would also address any unusual or unique aspects of the project activities.

The decommissioning contractor would also prepare and adhere to AHAs as part of a total risk management process. The AHAs would be developed and updated as needed by personnel performing the decommissioning and dismantlement activities. Each AHA would:

- Define the steps to perform the work
- Assign risk assessment codes to each step
- Identify the Competent Person(s) required for specific tasks (e.g., excavation, scaffolding, fall protection, rigging)

The preparation of and adherence to additional task-specific safety plans during the Proposed Action would include, but not be limited to:

- Fatigue Management Plan (EM 385-1-1, Section 01.A.20)
- Grinding and abrasive machinery (EM 385-1-1, Section 13.B)
- Developing critical lift plans (EM 385-1-1, Section 16.H)
- Machinery and mechanized equipment (EM 385-1-1, Section 18.G)
- Fall protection program (EM 385-1-1, Section 21.D)
- Scaffolds (EM 385-1-1, Section 22.B)
- Structure Demolition (EM 385-1-1, Section 23.B)

- Excavation and trenching (EM 385-1-1, Section 25)
- Confined space permits (EM 385-1-1, Section 34)

Adherence to applicable plans and procedures as well as trade-specific best practices would, at minimum, minimize the scale or severity of any potential occupational accidents occurring on the site and the proportionate response required by fire and emergency services or emergency health care provided at on- or off-post medical facilities. Prior to performing particularly hazardous tasks or operations, additional coordination would be conducted by USACE and the decommissioning contractor with on- or off-post fire and emergency services or other relevant organizations to identify and prevent or minimize potential risks. Such activities may include handling of non-radioactive regulated materials and solid waste, confined space entry, or lifting heavy materials or objects with cranes.

Following the completion of site restoration activities (**Table 2.2-1**) and release of the site for unrestricted use, the potential for decommissioning-related occupational hazards or accidents would cease. Overall, through adherence to applicable safe work procedures and plans, the Proposed Action Alternative would have temporary, less-than-significant adverse impacts on non-radiological safety and health. In the long-term, the decommissioning and dismantlement of the SM-1A reactor facility, and the proper disposal of associated waste, would have beneficial effects on non-radiological health and safety.

Fire and Emergency Services

The Fort Greely Fire Department operates 24 hours a day and provides emergency medical, hazardous material, fire rescue, and fire suppression services. The Fort Greely Directorate of Emergency Services provides continuous public services on the installation including the Fort Greely Fire Division, Police, and other emergency response services. Gate entry, access control, and physical security at Fort Greely is also managed and controlled by the Fort Greely Directorate of Emergency Services.

Delta Junction is served by two volunteer fire departments: the Delta Junction Volunteer Fire Department and the Rural Deltana Volunteer Fire Department. These fire departments currently have a mutual aid agreement with Fort Greely. Off-post medical services are available at the Family Medical Center in Delta Junction, Alaska, approximately 4 miles north of Fort Greely.

Radiological Safety and Health

The Proposed Action Alternative would temporarily increase the potential for the incidental exposure of workers to radioactivity as radioactive materials contained in SM-1A are accessed, removed, characterized, sorted, packaged, and transported for disposal. The highest potential dose to workers would likely result from dismantlement, management, and disposition of materials within the VC. Radioactive materials that would be removed during decommissioning would primarily consist of solid materials such as building construction materials, reactor components, the grout-sand-soil mixture, and lead shielding.

USACE is committed to controlling the radiation dose (internal and external) to workers and members of the public in a manner avoiding unnecessary and accidental doses, and by maintaining environmental releases and occupational doses to workers below regulatory limits. Decommissioning activities involving the use and handling of radioactive materials would be conducted in a controlled manner to minimize and keep exposures to radiation ALARA. The USACE ALARA policy is stated in EM 385-1-80 as follows (USACE 2013):

USACE will work to ensure all personnel radiation exposure is kept ALARA taking technological, social, and economic factors into account. Radiation exposures to USACE personnel, visitors, and Contractors, as well as to the general public, will be controlled so exposures are held below regulatory limits.

Potential risks to workers would be minimized by the implementation of a Radiation Safety Program, an associated Radiation Protection Plan, and applicable BMPs. These programs, plans, and procedures would require the use of applicable PPE and establish limits and monitoring for worker exposure to radiation. All decommissioning personnel would be expected to be knowledgeable of work activities and to abide by ALARA requirements documented in work instructions and applicable radiation work plans. In addition, each worker would be responsible for minimizing their own exposure as well as exposure to other workers and the public.

The probability of a radiological accident that would involve the release of contamination is minimized by the fact that only small quantities of loose (removable) radioactive contamination exist within SM-1A, therefore all but eliminating a dispersion concern. Additionally, the majority of radiological activity that remains within SM-1A is contained within the metal matrix of the reactor components or is within building construction materials. Implementation of and adherence to project controls, such as containment structures, ventilation systems, and periodic application of water (as weather conditions allow) during soil excavation, would prevent the release or dispersal of radiologically contaminated dust, particulates, or other small debris beyond the SM-1A site. Therefore, no release of airborne radiological contamination exceeding applicable regulatory criteria is anticipated during decommissioning and dismantlement activities. USACE and the decommissioning contractor would conduct environmental monitoring throughout the Proposed Action Alternative to ensure controls are adequate to protect human health and the environment. Worker radiation exposures would be limited in accordance with the requirements of EM 385-1-80.

Overall, the NRC determined that radiological exposure risks are considered to be minor when decommissioning tasks are performed by trained occupational workers (NRC 2002). The NRC determined that with applicable control measures in place, impacts associated with non-spent fuel-related accidents are neither detectable nor destabilizing (NRC 2002). Public exposure to radiation would be significantly less than that of workers and meet requirements identified in the Decommissioning Permit. The NRC's decommissioning GEIS also indicates that the radiological impacts of decommissioning would remain within regulatory limits for worker and public exposures, and that radiological impacts from decommissioning much larger facilities would be small (NRC,

2002). Therefore, short-term impacts on the radiological safety and health of workers and the general public under the Proposed Action Alternative would be less-than-significant.

Following completion of site restoration activities and release of the site for unrestricted use, there would be no risk of exposure to radioactive contamination exceeding regulatory thresholds on the former SM-1A site. Therefore, the Proposed Action Alternative would have no long-term impacts on radiological safety and health. The removal of radioactive materials from SM-1A and their disposal and permitted facilities would represent a beneficial effect on radiological safety and health.

3.11.4 Radiological and Occupational Safety and Health BMPs

The following BMPs would be implemented during the Proposed Action Alternative to prevent or minimize potential impacts on radiological and occupational safety and health:

- Implement an Industrial Safety Program to establish safety and health procedures, practices, and the use of PPE.
- In accordance with EM 385-1-1, implement a site- and project-specific APP that would describe the specific work, work processes, equipment to be used, and hazards pertaining to the decommissioning activities.
- Implement a Waste Management and Disposal Plan that would establish procedures and requirements for the safe management, handling, storage, and transportation of waste to optimize safety and prevent or minimize risks to the extent possible.
- Prepare and adhere to AHAs that would define the steps to perform the work; assign risk assessment codes to each step; and identify the Competent Person(s) required for specific tasks.
- Prior to performing particularly hazardous tasks or operations, coordinate with on- or off-post fire and emergency services or other relevant organizations to identify and prevent or minimize potential risks.
- Conduct decommissioning activities in a controlled manner to minimize and keep radiological exposures ALARA in accordance with EM 385-1-80.
- Implement a Radiation Safety Program and Radiation Protection Plan that would require the use of applicable PPE and establish limits and monitoring for worker exposure to radiation in accordance with EM 385-1-1.
- Conduct environmental monitoring throughout the Proposed Action Alternative to ensure controls are adequate to protect human health and the environment.
- Enter into one or more MOAs with on- and/or off-post fire and emergency response services and/or emergency health care providers to minimize fire risk and ensure safety, define roles and responsibilities, and establish conditions for response, oversight, and monitoring.

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4.0 Cumulative Effects

This section analyzes the potential cumulative effects of the Proposed Action in combination with other past, present, and reasonably foreseeable actions in the ROI. A cumulative effects analysis determines if a federal proposed action would be likely to result in significant adverse impacts when combined with the known or anticipated impacts of other projects in the ROI.

4.1 Applicable Guidance

In accordance with 40 CFR 1508.7, and as detailed in CEQ guidance⁵ entitled *Considering Cumulative Effects Under NEPA (1997) and Memorandum: Guidance on the Considerations of Past Actions in Cumulative Effects Analysis (24 June 2005)*, USACE must analyze the potential cumulative effects that may occur when considering a proposed action “when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.” Each of these actions has the potential to affect resources in the same time and space as the Proposed Action; as such, an analysis of these potential combined effects is required.

Cumulative effects may be accrued over time and/or in conjunction with other pre-existing effects from other activities in the ROI (40 CFR 1508.25). Therefore, previous impacts and multiple smaller impacts should also be considered. Overall, assessing cumulative effects involves defining the scope of the other actions and their interrelationship with a proposed action to determine if they overlap in space and time. Cumulative effects can result from separate actions that are individually minor—but collectively significant—when they occur at the same location over time.

4.2 Region of Influence

The ROI for the cumulative analysis primarily encompasses the SM-1A site and immediately surrounding on-post and off-post areas; specifically, past, present, and reasonably foreseeable future actions at Fort Greely, as the Proposed Action’s impacts would primarily be localized and occur on the SM-1A site or in nearby on-post areas. For certain resources, the cumulative effects analysis examines impacts that could occur in areas outside Fort Greely, such as major off-post public roads from Fort Greely to Fairbanks. The temporal scope spans the timeline of the Proposed Action to encompass all proposed decommissioning and dismantlement activities.

4.3 Past, Present, and Reasonably Foreseeable Future Projects

The cumulative analysis identifies projects likely to have the potential for contributing to cumulative effects or the Proposed Action’s incremental impact when combined with the

⁵ Substantive preparation of this EA began prior to updates to the CEQ regulations implementing NEPA that became effective on September 14, 2020. Therefore, this Draft EA has been prepared in accordance with the NEPA regulations that were previously in effect.

potential impact of a past, present, or future project. These projects occur in the ROI and may affect the same resources that would be affected by the Proposed Action.

As past actions have been assessed in the environmental baseline and are already considered in the impact analysis (Chapter 3), this cumulative analysis focuses on present and reasonably foreseeable future projects. Past projects are only considered if their long-term and operational impacts would occur to similar resource areas at the same time as the Proposed Action, contributing to cumulative impacts.

The present and reasonably foreseeable future projects on Fort Greely considered in this cumulative analysis are briefly summarized in **Table 4.3-1**. While detailed timeframes for most of these projects are unknown, they are anticipated to occur in the next 5 years (2020 to 2025).

Table 4.3-1: Past, Present, and Reasonably Foreseeable Future Actions

Name	Status	Description
Ground-Based Midcourse Defense Expanded Capability, Fort Greely	Ongoing	Construction and operational activities are proposed for an additional ground-based interceptor field and associated support facilities, utilities, and infrastructure at Fort Greely. If deployed, the interceptor field would expand the existing Ground-based Midcourse Defense element of the Ballistic Missile Defense System. The proposed activities began in spring 2018 and will continue through 2021, with the site being operational by 2023 (DOD 2018).
Richardson Highway Improvements	Past and Ongoing	ADOT&PF maintains Richardson Highway. Near Fort Greely, recent and ongoing improvements to the highway in 2020 include construction of improved passing lanes between Milepost 266 and 341. No construction projects are planned in the vicinity of Fort Greely or on the Richardson Highway between Fort Greely and Fairbanks in ADOT&PF's 5-year planning database (ADOT&PF 2020a).
Various small maintenance and operations projects on Fort Greely	Ongoing and Future	<ul style="list-style-type: none"> • Roof replacement, Buildings 102 and 100 • Demolition of GCI building • Construct redundant Comms MILCOM, Building 3001 • Emergency flooding communication utilidor, Buildings MH 58 and 59 • Installing lightning grid, Building 501 • Install FE6 fencing around fuel tanks, 10 buildings • Install building sign, Building 661 • Replace 501 VTC A/V equipment, Building 501 • Repair fencing by Building 660 • Install perimeter fence gate
Richardson Highway Planning and Environmental Linkage Study	Future	ADOT&PF plans to conduct a Planning and Environmental Linkage Study to define the scope, preliminary design elements, and conduct preliminary environmental analysis in order to identify projects in the corridor for future design and construction projects (ADOT&PF 2020a).

Notes:
 ADOT&PF = Alaska Department of Transportation and Public Facilities
 A/V = audio/visual

The collective impacts of past, present, and reasonably foreseeable future projects would be less-than-significant. Ongoing and future actions requiring construction, such as road improvements and the new interceptor field, would cause physical disturbance of surrounding soils and generate air emissions, fugitive dust, non-radioactive regulated materials and solid waste, and runoff; however, these effects would be temporary and minimized through applicable BMPs. These projects would occur in already developed

areas; therefore, potential impacts on soils, biological, and cultural resources would be minimal. This cumulative analysis also assumes that potential impacts from present and reasonably foreseeable future projects would be further minimized to the greatest extent practicable through adherence to applicable mitigation measures, BMPs, and/or federal, state, local, and DOD/Army regulatory requirements.

4.4 Assessment of Cumulative Impacts

The significance thresholds for the cumulative effects analysis consider the respective significance thresholds for each resource area analyzed in this Draft EA, as described in Chapter 3. Cumulative impacts are considered to be potentially significant if the Proposed Action's additional impact on the effects of past, present, and reasonably foreseeable future projects is substantial enough to measurably affect the resource area. The term "measurably" is defined as being noticeable or detectable to a reasonable person.

4.4.1 Cumulative Effects under the No Action Alternative

Under the No Action Alternative, decommissioning and dismantlement of the deactivated SM-1A Nuclear Power Plant Facility would not occur. SM-1A would remain in the current SAFSTOR condition for the foreseeable future. Overall site conditions would remain unchanged as no decommissioning or dismantlement activities would take place; therefore, the No Action Alternative would not result in any incremental effects. In conjunction with past, present, and reasonably foreseeable future projects, the No Action Alternative would result in no cumulative impacts.

4.4.2 Cumulative Effects under the Proposed Action Alternative

Overall, incremental effects of the Proposed Action Alternative, when considered with effects of past, present, and reasonably foreseeable future projects, would contribute short-term, less-than-significant adverse cumulative impacts on air quality, water resources, soils, transportation, waste, utilities, and biological resources. Ground-disturbing activities associated with both the Proposed Action and the expansion of the Ground-Based Midcourse Defense element, would collectively increase air emissions, sedimentation, and non-radioactive regulated materials and solid waste in the ROI. Both projects would also have the potential to temporarily disrupt local wildlife and utility services. Impacts from additional truck traffic under the Proposed Action, combined with potentially increased traffic congestion from the Ground-Based Midcourse Defense project and Richardson Highway improvements, would be expected to be highly localized and remain within the existing road capacity. Short-term, less-than-significant adverse cumulative effects would be further minimized to the extent practicable through project-specific BMPs.

While the Proposed Action Alternative would result in an adverse effect on cultural resources from the dismantlement and disturbance of historic properties, it would not result in potentially significant cumulative impacts when combined with past, present, and reasonably foreseeable future projects. Projects listed in **Table 4.3-1** occurring outside Fort Greely (Richardson Highway Improvements, Richardson Highway PEL Study) would have no potential to affect cultural resources on the installation. Impacts on cultural resources outside Fort Greely would also be unlikely to result from the projects listed in

Table 4.3-1, as these projects would primarily occur on previously disturbed land. Further, ongoing and future projects occurring on Fort Greely, including the Ground-Based Midcourse Defense Expanded Capability and various small maintenance and operations projects, such as the roof replacement at Buildings 102 and 100, demolition of GCI building, installation of FE6 fencing around fuel tanks at 10 buildings, installation of a building sign at Building 661, and installation of a perimeter fence gate, would adhere to the requirements of NHPA Section 106 and applicable BMPs to avoid, minimize, or mitigate adverse effects on historic properties. These projects would also adhere to applicable policies in the USAG Alaska INRMP in the event of unanticipated discoveries of archaeological materials or human remains. Execution of an MOA between USACE, the Alaska SHPO, and consulting parties would ensure that the Proposed Action's potential project-specific and cumulative adverse impacts on cultural resources and historic properties, when considered with other projects potentially affecting those resources, would remain less-than-significant.

The Proposed Action would result in beneficial cumulative effects on health and safety, when taken into consideration with the effects of other past, present, and future actions in the ROI. Decommissioning the SM-1A facility, in conjunction with roadway improvements to Richardson Highway, would contribute to safer conditions in the ROI. Other projects or activities in the vicinity of the SM-1A site would have reduced safety concerns in the long-term as radioactive and non-radioactive wastes would be removed. Removal of radioactive waste and non-radioactive regulated solid waste would preclude the potential for accidental spills and releases.

Based on the assessed potential incremental impacts of the Proposed Action Alternative and the anticipated effects of the present and reasonably foreseeable future activities considered in this cumulative analysis, there would be no significant adverse cumulative impacts from the Proposed Action Alternative. Adverse cumulative effects would be short-term and less-than-significant; long-term beneficial cumulative impacts would occur as well.

5.0 Conclusions and Other Related Disclosures

This Draft EA evaluates the potential environmental impacts of the proposed decommissioning and dismantlement of the deactivated SM-1A Nuclear Power Plant. The Proposed Action includes site preparation; removal of facility components, on-site structures, radioactive waste and non-radioactive regulated solid waste; waste transport and disposal; site restoration; termination of the U.S. Army-issued SM-1A decommissioning permit; and release of the SM-1A site for unrestricted use. This Draft EA evaluates impacts from both the Proposed Action Alternative and the No Action Alternative. This analysis finds that the Proposed Action would have no significant adverse impacts on the environment, either individually or cumulatively, if applicable regulatory and permitting requirements, BMPs, and minimization measures are adhered to.

The Proposed Action would demolish key elements of the NRHP-eligible SM-1A Nuclear Power Plant and would remove contributing resources from the NRHP-eligible Fort Greely Historic District, resulting in an adverse effect on historic properties under NHPA Section 106. In consultation with the Alaska SHPO and other participating consulting parties, USACE will develop a MOA with stipulations to resolve adverse effects on historic properties. The MOA, once executed, would resolve the adverse effect consistent with 36 CFR 800.6(c), such that project impacts would remain less-than-significant.

USACE would comply with all applicable federal, state, and local regulatory and permitting requirements. Adverse impacts on resources analyzed in this Draft EA would not meet the conditions requiring preparation of an EIS under 32 CFR 651.41. The Army has determined that the Proposed Action is not an action normally requiring preparation of an EIS as defined under 32 CFR 651.42. Therefore, a FNSI is the appropriate decision document for the Proposed Action.

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7.0 Preparers

The individuals listed in **Table 7-1** contributed to the preparation and review of the Draft EA.

Table 7-1: List of Preparers

Name	Role
U.S. Army Corps of Engineers—Baltimore District	
Brenda M. Barber	Program Manager/Contracting Officer's Representative
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Table 7-1: List of Preparers

Name	Role
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Jessica Evans	Subject Matter Expert—Utilities, Transportation and Traffic, Socioeconomics/Environmental Justice
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Caitlin Shaw	Subject Matter Expert—Air Quality
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8.0 Distribution of the Draft Environmental Assessment

The individuals, agencies, organizations, Alaska Native tribal governments, and ANCSA corporations listed in **Table 8-1** will be notified of the availability of the Draft EA during the 30-day public review and comment period.

Table 8-1: Draft EA Distribution List

Name	Title/Division	Agency
Department of Defense		
Sam Klein	Environmental Support Manager, Environmental Command	Army Environmental Command
Yvonne Tyler	Environmental Protection Specialist	Installation Management Command G4/IMPW-E
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Michael Salyer	Chief, Environmental Resources Section	USACE Alaska District/POA
Darrell Liles	Health Physicist	USACE Environmental and Munitions Center of Expertise (EM CX)
Stephen Castellane	Environmental Engineer	USACE EM CX
Julie Clements	Health Physicist	USACE EM CX
Mark Fisher	Industrial Hygienist	USACE EM CX
Rebecca Latka	NEPA Specialist	USACE EM CX
Walter Roberts	Project Controls Manager	USACE EM CX
Brian Hearty	National Program Manager, USACE Deactivated Nuclear Power Plant Program	USACE HQ
LTC Meghan Poirier	Attorney	USAG Alaska Legal Council
Shawn Baker	Director of Public Works	USAG Fort Greely
Charles Bailey	UP Chief	USAG Fort Greely
Steve Bowdre	DPW, Operations and Maintenance Chief	USAG Fort Greely
Ron Crofford	Director of Public Works - Environment	USAG Fort Greely
Lt. Col. Joel Johnson	Installation Command	USAG Fort Greely
Rob Mathews	Chief of Physical Security	USAG Fort Greely
LTC Eric Marcellus	Construction and Facilities Management Officer 38th Troop Command XO Alaska Army National Guard	USAG Fort Greely
Steve Baugh	Division Chief, Operations Support Division - Alaska Region Missile Defense	USAG Fort Greely
Leo Palmer	Environmental Office Representative	USAG Fort Greely
Matt Sprau	Director of Public Works	USAG Fort Wainwright
Laura Sample	DPW - NEPA Program Manager	USAG Fort Wainwright

Table 8-1: Draft EA Distribution List

Name	Title/Division	Agency
Elizabeth Cook	Cultural Resources Manager/Native Liaison USAG Alaska	USAG Fort Wainwright
Kimberlie Hughes	Safety and Occupational Health Specialist	USAG Fort Wainwright
Gail Murray	Safety and Occupational Health Specialist	USAG Fort Wainwright
Robert Cherry	Radiation Safety Officer, HQ IMCOM	U.S. Army
Calvin Williams	Safety Director	U.S. Army
James Ambler	Health Physicist	U.S. Army
Tracey Carter	Environmental Attorney for USAG-AK	USAG Fort Greely
LTC Jama VanHorne-Sealy	Manager	Army Reactor Program
MAJ Scott Julich	Nuclear Engineer	Army Reactor Program
Tim Mikulski	Health Physicist, Office of the Director of Army Safety	Army Reactor Program
Bryan Frey	Functional Lead for Restoration	Army Reactor Program
LTC Crystal Boring	Director of Public Affairs	Army Reactor Program
Federal Agencies		
MAJ Kathryn Hermon	Project Manager, Alaska District, Environmental and Special Programs	USACE
Jeffrey Andrews	Deputy Chief EMDC	USACE CENAB
Eugene Peltola	Regional Director	Bureau of Indian Affairs
Leslie DeWilde	Fairbanks Agency, Superintendent	Bureau of Indian Affairs
Chad Padgett	State Director	Bureau of Land Management
Geoff Beyersdorf	Fairbanks District Manager	Bureau of Land Management
David Magdangal	NEPA Reviewer, Region 10	U.S. Environmental Protection Agency (USEPA)
Dave Bartus	Cleanup, PCB Radioactive Waste, Region 10	USEPA
Lauren Boldrick	Geologist and NEPA Reviewer, Region 10	USEPA
Kelly McFadden	Manager, Pesticides and Toxics Unit, Region 10	USEPA
Jennifer Mosser	Captain, U.S. Public Health Service, Region 10	USEPA
Karl Pepple	Acting Chief, Policy and Environmental Review Branch, Region 10	USEPA
Edward Kowalski	Enforcement & Compliance, Director, Region 10	USEPA
Tim Hamlin	Land, Chemicals, & Redevelopment, Director, Region 10	USEPA

Table 8-1: Draft EA Distribution List

Name	Title/Division	Agency
Sheila Fleming	Superfund & EMD, Director, Region 10	USEPA
Dan Opalski	Water Division, Director, Region 10	USEPA
Jim McAuley	Health Physicist, Region 10	USEPA
Greg Balogh	Protected Resources Division	National Marine Fisheries Service
Doug Limpinsel	NMFS Alaska Region, Habitat Conservation Division	National Marine Fisheries Service
Bert Frost	Regional Director, Alaska Regional Office	National Park Service
Bill Maier	NRC POC	Nuclear Regulatory Commission
Alan McBee	Natural Resources Conservation Service	U.S. Department of Agriculture
Sandra Garcia-Aline	Federal Highway Administration, Alaska Division	U.S. Department of Transportation
Sarah Conn	Fairbanks Field Supervisor	U.S. Fish and Wildlife Service
Mateusz Lemanski	Marine Inspector, Sector Anchorage	U.S. Coast Guard
Tribal Governments and ANCSA Corporations¹		
Gary Harrison	Chairman	Chickaloon Native Village
Brandy O'Malley	Acting Executive Director/Accounting Director	Chickaloon Native Village
Eileen Ewan	President	Gulkana Village
Evelynn Combs	Acting Tribal Administrator	Healy Lake Village / Menda Cha-ag Native Corporation
Michael Tucker	President	Knik Tribal Council
Rene Nicklie	President	Native Village of Cantwell
Aaron Leggett	President	Native Village of Eklutna
Herbert Demit	President	Native Village of Tanacross
Michael Sam	First Chief	Native Village of Tetlin
Tim McManus	First Chief	Nenana Native Association / Nenana Traditional Council
Gerald Albert	President	Northway Village / Northway Traditional Council
Tracy Charles-Smith	President	Village of Dot Lake
Patricia Young	Environmental Director	Native Village of Tetlin
Darrell Kaase	Tribal Administrator	Northway Village / Northway Traditional Council
Michelle Anderson	President	Ahtna, Inc.
Edith Baller	President	Chickaloon Moose Creek Native Association, Inc.
Sophie Minich	President and CEO	Cook Inlet Region, Inc. (CIRI)

Table 8-1: Draft EA Distribution List

Name	Title/Division	Agency
Aaron Schutt	President and CEO	Doyon, Limited / Hungwitchin Corporation / Tihtet'aii, Incorporated
Michael Curry	Chair and President	Eklutna, Inc.
Ray Atwood	President and CEO	Toghotthele Corporation
State Agency		
Randy Bates	Director, Division of Water	Alaska Department of Environmental Conservation (ADEC)
Gary Mendivil	Environmental Program Specialist, Commissioner's Office	ADEC
Melinda Brunner	Fairbanks CS Unit Manager, Division of Spill Prevention and Response	ADEC
Neil Lehner	Industrial Waste Specialist, Municipal and Military Landfills	ADEC
Doug Buteyn	Solid Waste Regional Manager, Division of Environmental Health, Solid Waste Program	ADEC
Rebecca Spiegel	Prevention Preparedness and Response, Section Manager, Division of Spill Prevention and Response, Prevention Preparedness and Response	ADEC
Sarah Moore	State On Scene Coordinator, Division of Spill Prevention and Response, Prevention Preparedness and Response	ADEC
Kaylie Holland	Technical Specialist, Division of Environmental Health, Solid Waste Program; State POC for NWIC	ADEC
Graham Wood	Program Manager, Federal Facilities Lead, Division of Spill Prevention and Response	ADEC
Denise Koch	Director, Division of Spill Prevention and Response	ADEC
Alice Edwards	Director, Division of Air Quality	ADEC
Christina Carpenter	Director, Division of Environmental Health	ADEC
Erica Blake	Environmental Program Specialist, Division of Spill Prevention and Response	ADEC
Craig Ziolkowski	State Liaison Officer to the NRC, Division of Spill Prevention and Response	ADEC
John Ebel	Interior and TAPS, Division of Spill Prevention and Response	ADEC
Cindy Christian	Program Manager, Division of Water, Drinking Water Program	ADEC

Table 8-1: Draft EA Distribution List

Name	Title/Division	Agency
Earl Crapps	Environmental Program Manager, Division of Water, Domestic and Industrial	ADEC
Bob Blankenburg	Program Manager, Division of Environmental Health, Solid Waste Program	ADEC
Audra Brase	Regional Supervisor - Fairbanks, Habitat Section	Alaska Department of Fish and Game (ADF&G)
Douglas Vincent-Lang	Commissioner, Commissioner's Office	ADF&G
Edward Grasser	Director, Division of Wildlife Conservation	ADF&G
Darren Bruning	Fairbanks Regional Director, Division of Wildlife Conservation	ADF&G
Sarah Yoder	Deputy Environmental Health Program Manager, Division of Public Health	Alaska Department of Health and Social Services
Irene Casares	Radiological Health Physicist II, State Public Health Laboratories	Alaska Department of Health and Social Services
Brent Goodrum	Deputy Commissioner, Division of Mining, Land, and Water	Alaska Department of Natural Resources (ADNR)
Marty Parsons	Director, Division of Mining, Land, and Water	ADNR
Corrie Feige	Commissioner, Office of the Commissioner	ADNR
Judith Bittner	State Historic Preservation Officer, Office of History and Archaeology	ADNR
Sarah Meitl	Coordinator, Review and Compliance, Office of History and Archaeology	ADNR
Alyssa Millard	SAIL Northern Office Lead, Division of Mining, Land, and Water, Statewide Abatement of Impaired Land (SAIL) Section	ADNR
Cathe Heroy	Large Project Coordinator, Office of Project Management and Permitting	ADNR
Ricky Gease	Director, Division of Parks and Outdoor Recreation	ADNR
Patty Burns	Environmental Coordinator, Division of Mining, Land, and Water	ADNR
Tom Barrett	Water Section Chief, Division of Water; ACWA Coordinator for ADNR	ADNR
John MacKinnon	Commissioner, Officer of the Commissioner	Alaska Department of Transportation and Public Facilities (ADOT&PF)
Ryan Anderson	Regional Director, Northern Region	ADOT&PF
Jason Sakalakas	Maintenance and Operations Chief, Northern Region	ADOT&PF

Table 8-1: Draft EA Distribution List

Name	Title/Division	Agency
Michelle Renfrew	Senior Account Manager	Alaska Railroad Corporation
Dale Wade	Vice President, Marketing and Customer Service	Alaska Railroad Corporation
Patrick Volmer	Whittier Region	Alaska Railroad Corporation
Arlene Rhoades	Chief Train Dispatcher	Alaska Railroad Corporation
Phillip Rogers	Director of Operating Practices	Alaska Railroad Corporation
Jon Garner II	Superintendent of Transportation	Alaska Railroad Corporation
Andrew Burgess	Transportation Field Manager	Alaska Railroad Corporation
Federal Congressional Public Officials		
The Honorable Don Young	United States Representative	-
The Honorable Dan Sullivan	United States Senator	-
The Honorable Lisa Murkowski	United States Senator	-
State and Local Public Officials		
The Honorable Michael Dunleavy	Governor	Office of the Governor, State of Alaska
The Honorable Kevin Meyer	Chair/Lieutenant Governor	Alaska Historical Commission
The Honorable Jim Matherly	Mayor	City of Fairbanks
The Honorable Michael Welch	Mayor	City of North Pole
The Honorable Bryce Ward	Mayor	Fairbanks North Star Borough
The Honorable Austin Quinn-Davidson	Mayor	Municipality of Anchorage
Local Government		
Steve Ribuffo	Port Director	Port of Anchorage
Dave Borg	Harbormaster	Port of Whittier
Mary Leith	City Administrator	City of Delta Junction
Mark Deter	City Manager	City of Valdez
Michelle McNulty	Planning Director, Planning Department	Municipality of Anchorage
Andrew Halcro	Executive Director, Anchorage Community Development Authority	Municipality of Anchorage
Other Entities		
Dr. Jessica Black	President	Fairbanks Native Association
Karen Matthias	Alaska Consultant	Northwest Seaport Alliance (WA State)
Earl Fordham	Compact Chair and Executive Director	Northwest Interstate Compact (NWIC)
Jeff Durham	Program Director	Salcha-Delta Soil and Water Conservation District
Victor Joseph	President	Tanana Chiefs Conference

Table 8-1: Draft EA Distribution List

Name	Title/Division	Agency
Richard (Rick) Stillie	Deputy Director of Utilities, Fort Greely	Doyon Utilities LLC
Charlie Harmon	Editor	The Nuke Digest (Publication)
Shannon Martindale	Operations and Maintenance Superintendent	Port of Alaska
Mike Lichter	Vessel Agent, ANP Shipping Co.	North Pacific Maritime, Inc
Les Crank	Vice President, ANP Shipping Company	North Pacific Maritime, Inc
Cliff Bartley	Manager, Dangerous Goods	Matson
Laura Armstrong	Alaska Customer Service	Matson
Andrew J. Mew	Vice President	Alaska Maritime Agencies
Brad Robertson	Operations Manager	North Star Equipment Services
Craig Piercy	Executive Director/CEO	American Nuclear Society
Libraries and Universities		
Katherine Arndt	Associate Professor, Bibliographer and Curator of Rare Books	UAF Rasmuson Library, Alaska, Polar Regions Collections & Archives
Pat Druckenmiller	Museum Director	University of Alaska Museum of the North
William Schneider	President	Alaska Historical Society
-	-	Delta Community Library
-	-	Fort Wainwright Library
-	-	Noel Wien Public Library
-	-	Z. J. Loussac Public Library

Note:

¹ ANCSA corporations and tribal government representatives listed in this table may be the same contact but act as separate roles/entities for their respective corporation or tribe.

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Appendices

Appendix A—Interagency/Intergovernmental Coordination for Environmental Planning

Copies of relevant stakeholder correspondence, including stakeholder and tribal outreach letters; agency responses; and correspondence with the SHPO are provided in this appendix.

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Environmental Assessment Scoping Correspondence

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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201



CENAB-ENE-C

July 17, 2020

USACE Baltimore District

Shawn Baker
Director of Public Works
USAG-AK FGA
P.O. Box 31269
Fort Greely, AK 99731

SUBJECT: Request for Input on the Proposal to Decommission and Dismantle the Deactivated SM-1A Nuclear Reactor Facility at Army Garrison Alaska Fort Greely, Delta Junction, Alaska

Dear Sir:

The United States Army Corps of Engineers (USACE) is seeking your input on a new proposed action. Our team has started the initial planning for the decommissioning and dismantling of the deactivated SM-1A nuclear reactor at Fort Greely, Alaska. The facility was deactivated in 1972 and partially decommissioned, with its reactor components encased in concrete and in safe storage since the early 1973. USACE requests your input on this Proposed Action as part of the National Environmental Policy Act (NEPA) process, which we are conducting in accordance with the NEPA of 1969 (42 United States Code [USC] 4321 et seq.), Council on Environmental Quality (CEQ) Regulations Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508), and 32 CFR Part 651 (Environmental Analysis of Army Actions, Final Rule).

We are seeking feedback from elected officials, regulatory agencies, and other stakeholders to provide input on the Proposed Action, potential alternatives, relevant issues, and environmental resource areas of concern. Your input will help inform and shape the environmental impact analysis that will be presented in a Draft Environmental Assessment (EA). A stakeholder list is attached. If you know of any other stakeholders, not included on that list, who would be interested in providing input on the Proposed Action, please let us know so we may include them.

The purpose of the Proposed Action is to safely remove, transport, and dispose of all materials and equipment, structures, and residual contamination associated with the facility. We will release the SM-1A site for unrestricted use in accordance with the radiological dose criteria established by the NRC at 10 CFR 20.1402 and adopted by the Army. The need for the Proposed Action is to complete the final decommissioning of SM-1A within 60 years of its final shutdown in accordance with the Army's Deactivated Nuclear Power Plant Program and NRC regulations adopted by the Army Reactor Office in Army Regulation 50-7. A figure highlighting the Proposed Action is attached to this letter as an attachment.

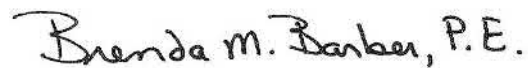
Please provide input by August 21, 2020 so that we may incorporate your input early and allow the NEPA process to proceed efficiently. USACE will conduct public outreach and take formal public comment after we prepare and publish the Draft EA. Please send your written comments or questions to my attention at:

U.S. Army Corps of Engineers, Baltimore District
2 Hopkins Plaza (09-A-10 (Cube))
Baltimore, Maryland 21201
Brenda.M.Barber@usace.army.mil

USACE would like to thank those Stakeholders that were able to attend our pre-Technical Project Planning meetings, held on June 11th and 12th, 2020. For those who were unable to attend, additional information, including transcripts and a recording of the meetings, is available online at: <https://www.nab.usace.army.mil/SM-1A>.

We were hoping to be able to host on-site TPP meetings later this summer, but the COVID-19 situation has not improved enough to do so at this time. This would have involved personnel from across Alaska and the Lower 48 - including Fort Greely staff, State regulators, the Army Reactor Office, and other key stakeholders - traveling and meeting together which may pose unnecessary health risks to the installation staff and local community, so we have made the decision to postpone the TPP at this time. We will be hosting one on one meetings with regulators to plan for additional sampling efforts at the site. We hope to host the on-site TPP early next year. We will be setting up the focused regulatory calls for the first two weeks of August.

Sincerely,



Brenda M. Barber, P.E.
Program Manager

Attachments: Proposed Action Figure; Stakeholder List



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201

June 23, 2020

USACE-Baltimore District

Edith Baller, President
Chickaloon Moose Creek Native Association, Inc.
PO Box 875046
Wasilla, AK 99687

Dear Ms. Edith Baller:

In accordance with Section 161 of Public Law 108-199, Section 518 of Public Law 108-447 and E.O. 19175, I am writing to inform you that the U.S. Army Corps of Engineers (USACE) is in the early stages of developing a plan for the decommissioning and dismantling of the deactivated SM-1A nuclear reactor at Fort Greely, Alaska. Current information about the proposed action can be found on our website at the following link and is also summarized below. <http://www.nab.usace.army.mil/SM-1A/>.

The Corps' expert radiological team, based in the Baltimore District, is working closely with the USACE, Alaska District and U.S. Army Garrison, Alaska to plan the decommissioning of the SM-1A nuclear reactor at Fort Greely. SM-1A was partially decommissioned and placed in safe storage in the early 1970s. Its reactor components are currently entombed in concrete and the site has been subject to regular inspection and monitoring by USACE. The Proposed Action would remove radioactive and non-radioactive materials from SM-1A, dismantle facility structures, and release the property for unrestricted use.

The USACE is developing a draft Environmental Assessment (EA) to address alternatives for decommissioning the SM-1A reactor. Although in the preliminary stages of development, I would like to invite you to review the information on the proposed action and evaluate whether you believe there may be potential for this action to affect corporate lands, waters, or other natural resources. This invitation is made pursuant to USACE's policy for government-to-government consultation with American Indian and Alaska Native tribes.

If you believe that corporate lands or resources may be affected by this activity and wish to initiate consultation please contact the Project Manager listed below. Additionally, the Baltimore District is initiating consultation under Section 106 of the National Historic Preservation Act (NHPA). If you are interested in consulting on the Section 106 process, please notify the Project Manager, as well.

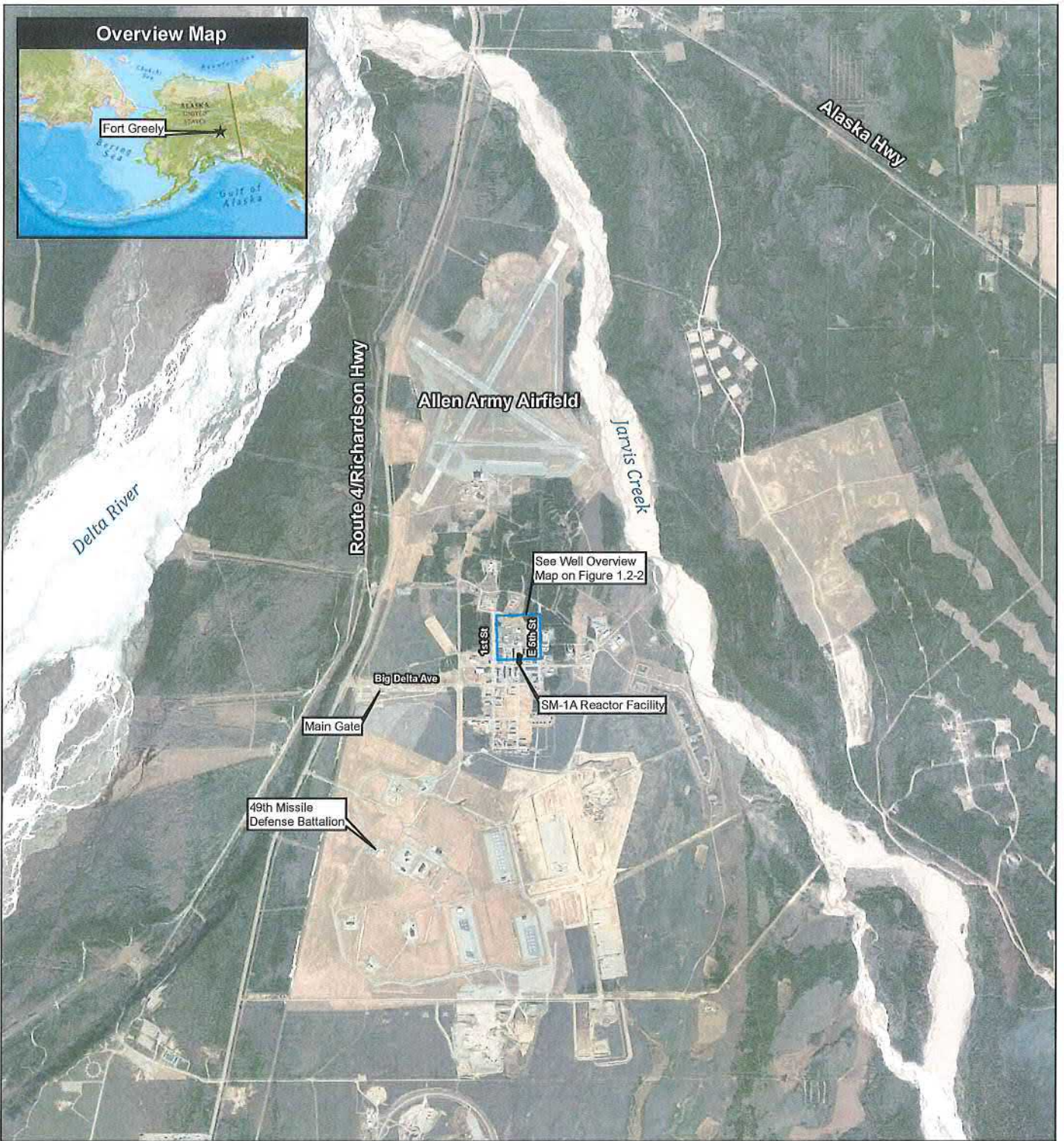
Given the current COVID-19 pandemic circumstances, the Corps is exploring virtual options for public engagement and can share those details once finalized. We are also happy to include you on our stakeholder list to receive future updates. The Corps team is committed to providing timely information about this project to all stakeholders and has a stakeholder email list for distributing periodic project updates.

We look forward to continued engagement with your offices for this project. Elizabeth Cook cc'd, is the Native Liaison for U.S. Army Garrison Alaska (Forts Wainwright and Greely) and can assist with any follow-up questions you may have about the SM-1A reactor or the decommissioning project. She can be reached by e-mail at elizabeth.a.cook80.civ@mail.mil or by phone at 907-361-3002. You may also contact the Project Manager, Brenda Barber, by phone at 410-962-0030 or via email at Brenda.M.Barber@usace.army.mil



Very respectfully,

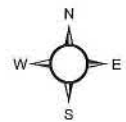
A handwritten signature in black ink, appearing to read 'John T. Litz', with a long horizontal flourish extending to the right.

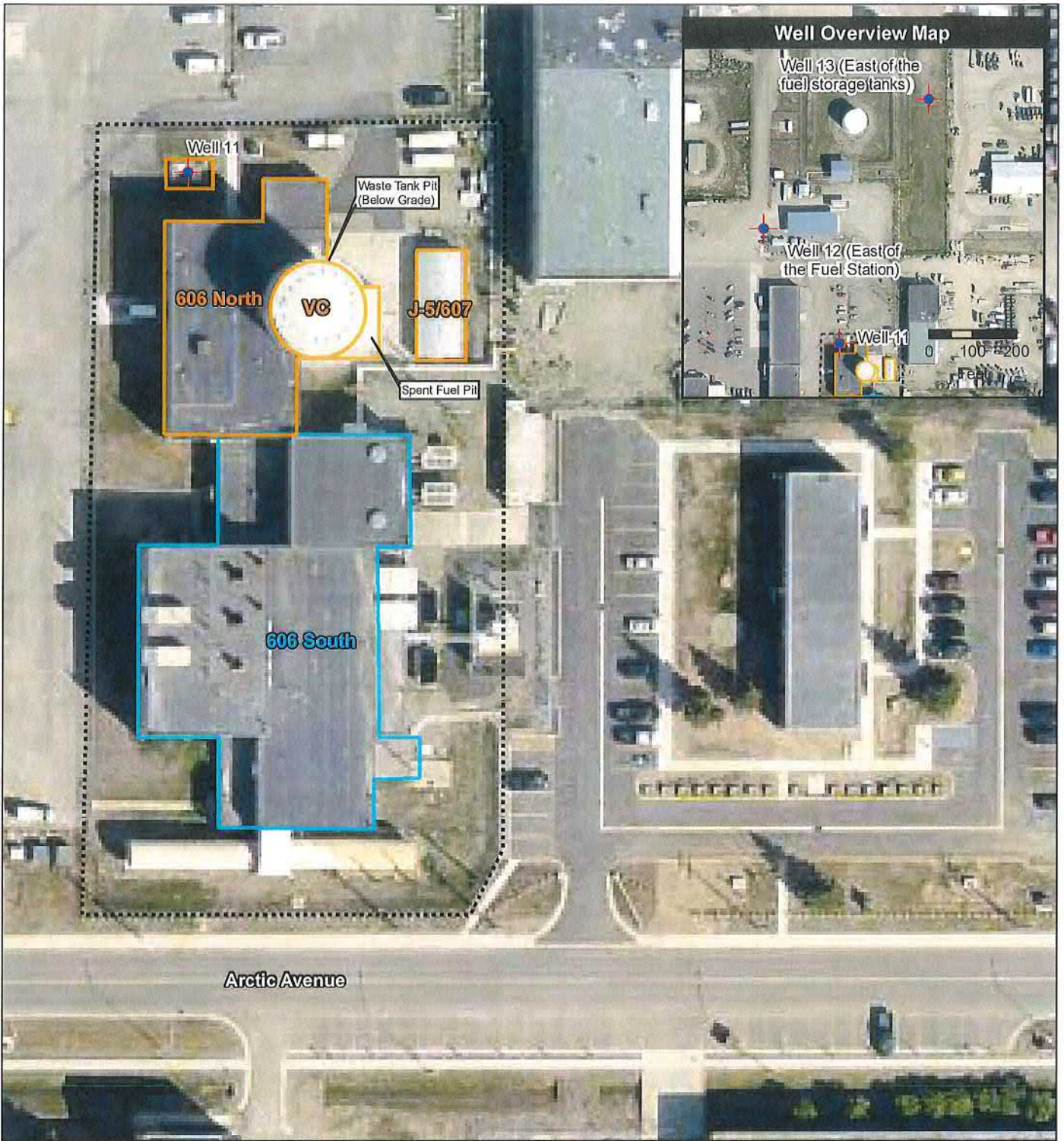
John T. Litz
Colonel, U.S. Army
Commander and District Engineer



LEGEND

-  SM-1A Reactor Facility
-  Map Inset






LEGEND

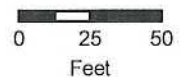
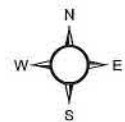
 Well

SM-1A Reactor Facility

 606 North

 606 South

 Site Perimeter Fenceline





THE STATE
of **ALASKA**
GOVERNOR MIKE DUNLEAVY

Department of Natural Resources

DIVISION OF MINING, LAND & WATER
Statewide Abatement of Impaired Land Section
Statewide Abandoned & Derelict Vessel Program

P. O. Box 111020
Juneau, Alaska 99811-1020
Main: 907.465.3400
TTY: 711 or 800-770-8973
Fax: 907.500.9011

Brenda Barber
U.S. Army Corps of Engineers, Baltimore District
2 Hopkins Plaza (09-A-10 (Cube))
Baltimore, Maryland 21201
Brenda.M.Barber@usace.army.mil

August 17, 2020

SUBJECT: Input on the Proposal to Decommission and Dismantle the Deactivated SM-1A Nuclear Reactor Facility at Army Garrison Alaska Fort Greely, Delta Junction, Alaska

Dear Brenda M. Barber, P.E.:

On behalf of Alaska Department of Natural Resources, Division of Mining, Land & Water and the Statewide Abatement of Impaired Land (SAIL) section we would like to include the following comments regarding the SM-1A Facility.

- ADNR SAIL section will request, and review reports related to Decommission and Dismantlement of SM-1A facility, due to the reactor, pipelines, and other related areas being state-selected lands.
- Proposal plan should include procedures for unanticipated contamination.

Thank you for the opportunity to comment.

Alyssa Millard

Alyssa Millard, Natural Resource Specialist
Statewide Abatement of Impaired Land (SAIL) Section
Alaska Department of Natural Resources,
Division of Mining, Land and Water
907-451-2739

Cc
Christy Colles, ADNR
Jeanne Proulx, ADNR
Adrienne Stolpe, ADNR
Lacy Hamner, ADNR
Patty Burns, ADNR



THE STATE
of **ALASKA**
GOVERNOR MIKE DUNLEAVY

Department of Environmental
Conservation

SPILL PREVENTION & RESPONSE
Contaminated Sites Program

610 University Avenue
Fairbanks, Alaska 99709
Main: 907.451.2143
Fax: 907.451.2155
www.dec.alaska.gov

File: 141.38.100
141.38.035
141.38.012
141.26.020

August 20, 2020

via Electronic Delivery Only

U.S. Army Corps of Engineers, Baltimore District
ATTN: Brenda Barber, P.E.
2 Hopkins Plaza (09-A-10 (Cube))
Baltimore, Maryland 21201

RE: ADEC Contaminated Sites Comments on the Proposal to Decommission and Dismantle the Deactivated SM-1A Nuclear Reactor Facility at Army Garrison Alaska Fort Greely, Delta Junction, Alaska

Dear Ms. Barber:

The Alaska Department of Environmental Conservation (ADEC) received a request for input on the Proposal to Decommission and Dismantle the Deactivated SM-1A Nuclear Reactor Facility at Army Garrison Alaska Fort Greely, Delta Junction, Alaska. The ADEC Contaminated Sites Program (CSP) has the following comments in response to the July 17, 2020 input request letter;

1. There are already three active sites entered into the CSP Database. The sites are; Fort Greely SMDC Nuclear Reactor SM1A (ADEC File Number: 141.38.035, Hazard ID: 1706), Fort Greely SMDC Bldg. 606 PP (ADEC File Number: 141.38.012, Hazard ID: 1711), Doyon Utilities at Fort Greely Bldg 606 USTs 1 & 2 (ADEC File Number: 141.26.020, Hazard ID:27219). With the three sites already in the CS Database, please ensure all site characterization and cleanup work is conducted under the following regulations; *18 AAC 75 Oil and Other Hazardous Substances Pollution Control* (as amended through October 27, 2018) and *18 AAC 78 Underground Storage Tanks* (amended as of September 27, 2018)
2. It would be helpful if the U.S. Corp of Engineers (USACE) and the Army could determine and identify the best way to manage radioactive soil mixed with other contaminants (for example, petroleum mixed with radioactive material). It is uncertain at this time what soil treatment options for radioactive material there are within the State of Alaska.
3. The ADEC CSP would like to be included in any work plan or report reviews for field sampling work.

The ADEC CSP appreciates the opportunity to be able to provide input on this Fort Greely SM-1A project. If there are any questions, please contact me by phone at (907) 451-2182, or by email at erica.blake@alaska.gov.

Sincerely,

Erica Blake
Environmental Program Specialist

cc (via email): Ronald Crofford, Chief, DPW Environmental Division FTGLY
Leopold Palmer, FTGLY ENVR Compliance Branch Chief
Neil Lehner, ADEC Solid Waste Program
Craig Ziolkowski, ADEC Prevention, Preparedness and Response Program



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10**

1200 Sixth Avenue, Suite 155
Seattle, WA 98101-3188

August 24, 2020

REGIONAL
ADMINISTRATOR'S
DIVISION

Brenda Barber
U.S. Army Corps of Engineers, Baltimore District
2 Hopkins Plaza (09-A-10 (Cube))
Baltimore, Maryland 21201

Dear Ms. Barber:

The U.S. Environmental Protection Agency has reviewed the U.S. Army Corps of Engineers July 22, 2020, *Request for Input on the Proposal to Decommission and Dismantle the Deactivated SM-1A Nuclear Reactor Facility at Army Garrison Alaska Fort Greely, Delta Junction, Alaska* (EPA Project Number 20-0040-USACE) which initiates USACE's issuance of an Environmental Assessment. The EPA comments are provided pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR 1500-1508) and Section 309 of the Clean Air Act.

This request describes the Proposed Action, which would safely remove, transport, and dispose of all materials and equipment, structures, and residual contamination associated with the Deactivated SM-1A Nuclear Reactor Facility at Fort Greely, Alaska. USACE proposes to be able to release the SM-1A site for unrestricted use in accordance with the radiological dose criteria established by the Nuclear Regulatory Commission at 10 CFR 20.1402 and adopted by the Army. USACE proposes to complete the final decommissioning of SM-1A within 60 years of its final shutdown in accordance with the Army's Deactivated Nuclear Power Plant Program and NRC regulations adopted by the Army Reactor Office in Army Regulation 50-7.

We appreciate the opportunity to review the Notice and provide scoping comments for the environmental review. We offer our assistance on this project as a participating agency. If you have questions concerning our comments, please contact the assigned NEPA Reviewers, Lauren Boldrick at (907) 271-5097 or boldrick.lauren@epa.gov or Betsy McCracken at (907) 271-1206 or mccracken.betsy@epa.gov.

Sincerely,

Andrew J. Baca
Director

EPA Scoping Comments on the proposed Decommissioning and Dismantling of the Deactivated SM-1A Nuclear Reactor Facility

Alternatives Criteria Development

The EA should identify specific criteria that would be used to (1) develop a range of reasonable alternatives, (2) eliminate alternatives considered, and (3) select the agency preferred alternative. Criteria that should be considered are the conservation of important aquatic and terrestrial habitats, maintaining wildlife and fish passage, economics, and public safety. The alternatives criteria should also incorporate substantive issues identified during the public scoping process and tribal consultation. The EA should discuss the rationale and basis for how these criteria were developed.

Range of Reasonable Alternatives

The EA should include a range of reasonable alternatives that meet the stated purpose and need for the project and that are responsive to the issues identified during the scoping process and through tribal consultation. It may be useful to analyze different decommissioning strategies or explain to the public and the decision-maker why certain strategies are not feasible for the Deactivated SM-1A Nuclear Reactor Facility. The Council on Environmental Quality (CEQ) recommends that all reasonable alternatives be considered, even if some of them could be outside the capability or the jurisdiction of the agency preparing the EA for the proposed action.

The environmental impacts of the proposal and alternatives should be presented in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision-maker and the public. The potential impacts of each alternative should be quantified to the greatest extent possible. It would also be useful to list each alternative action's impacts and corresponding mitigation measures. EPA encourages selection of feasible alternatives that will minimize environmental degradation.

Alternatives Analysis

EPA recommends that tables, maps, figures, charts, photos, etc., be used as much as possible and wherever appropriate to present and display information and specific features of alternatives so that the various alternatives can be clearly understood. We believe that an alternatives matrix table that summarizes major features and significant environmental impacts of alternatives should be provided to facilitate understanding of the alternatives, particularly distinctions between alternatives, and to provide a comparative evaluation of alternatives in a manner that sharply defines issues for the decision-maker and the public to make in regard to a reasoned choice among alternatives.

Endangered Species

The proposed project may impact protected species listed under the Endangered Species Act (ESA), their habitats, as well as state sensitive species. Evaluation of the proposal should identify the endangered, threatened, and candidate species under ESA and other sensitive species within the project corridor and surrounding areas. The EA should describe the critical habitat for the species; identify any

impacts the project will have on the species and their critical habitats; and how the proposed project will meet all requirements under ESA, including consultation with the U.S. Fish and Wildlife Service (FWS). The EA may need to include a Biological Opinion or Letter of Concurrence with FWS to document the agency's concurrence with your assessment.

Land Use

Land use impacts would include, but not be limited to, disturbance of existing land uses within decommissioning and dismantling work areas. The EA should document all land cover and uses within the project corridor, impacts by the project to the land cover and uses, and mitigation measures that would be implemented to reduce the impacts.

While the long-term restoration of the facility may be beneficial, the EA should also describe the potential short-term detrimental impacts that may occur during the project. The primary impact of decommissioning and dismantling activities on open land use types would be the removal of trees, shrubs, and other vegetation. Although these can be regenerated or replanted, their re-establishment can take up to 20 years or more, making the impacts of the proposed activities to these resources long term and in some cases permanent.

Mitigation Measures to Reduce Emissions During Construction

Mitigation measures are a foundational aspect of NEPA, which encourage the analysis of methods which help to avoid, minimize, rectify, reduce, or compensate for potential impacts. As the proposed project describes decommissioning and dismantling construction activities, EPA recommends analysis of whether these mitigation measures may encourage appropriate environmental protection. These recommendations include:

- Properly maintaining construction equipment.
- Evaluating the use of available alternative engines and diesel fuels:
 - Engines using fuel cell technology
 - Electric engines
 - Engines using liquefied or compressed natural gas
 - Diesel engines that meet the proposed EPA 2007 regulation of 0.01 g/bhp-hr (grams per brake horsepower hour)
 - Diesel engines outfitted with catalyzed diesel particulate filters and fueled with low sulfur (less than 15 ppm sulfur) fuel
 - Diesel engines fueled with biodiesel (diesel generated from plants rather than petroleum)
 - Fueling on-site equipment, e.g., mining equipment, with lower sulfur highway diesel instead of off-road diesel fuel
- Reducing construction-related traffic trips and unnecessary idling of equipment.
- Using newer, “cleaner” construction equipment.
- Installing control equipment on diesel construction equipment (particulate filters/traps (DPTs), oxidizing soot filter, oxidation catalysts, and other appropriate control devices to the greatest extent that is technically feasible.) A particulate filter (“P-trap” or oxidizing soot filter) may control approximately 80% of diesel PM emissions. An oxidation catalyst reduces PM emissions by only 20%, but can reduce CO emissions by 40%, and hydrocarbon emissions by 50%. Different control devices may be used simultaneously.
- Rerouting the diesel truck traffic away from communities and schools.

- Adopting a Construction Emissions Mitigation Plan (CEMP). A CEMP would help to ensure that the procedures for implementing all proposed mitigation measures are sufficiently defined to ensure a reduction in the environmental impact from diesel PM and NOx due to the project's construction. CEMP inclusions:
 - All construction-related engines are tuned to the engine manufacturer's specifications in accordance with the timeframe recommended by the engine manufacturer; not idle for more than 5 minutes; not tampered with in order to increase engine horsepower; include particulate traps, oxidation catalysts and other suitable control devices on all construction equipment used at the construction site; and use diesel fuel having a sulfur content of 15 ppm or less, or other suitable alternative diesel fuel. Minimize construction-related traffic trips through appropriate policies and implementation measures.
 - Implement an adaptive mitigation measure program over the project's construction phase.

Environmental Justice

EPA has developed a website with considerations and key references for environmental justice and the NEPA.¹ We encourage your use of this website and note Section VIII Disproportionately High and Adverse Impacts in the March 2016 Report of the Federal Interagency Working Group on Environmental Justice and NEPA Committee, "Promising Practices for EJ Methodologies in NEPA Reviews."² We further highlight use of the following conditions³ to help in the consideration of whether impacts to minority and low-income populations would be disproportionate and adverse.

- Exposure
 - exposure by minority populations and low-income populations to an environmental hazard that appreciably exceeds or is likely to appreciably exceed the risk or rate to the appropriate comparison group
- Human health or environmental impact
 - to minority populations and low-income populations is above generally accepted norms⁴
 - to minority populations and low-income populations exceeds or is likely to appreciably exceed the impact to an appropriate comparison group
 - predominantly borne by minority populations or low-income populations
 - occurs in minority populations and low-income populations affected by cumulative or multiple adverse exposures from environmental hazards
 - to minority populations and low-income populations is significant and adverse.

Community Involvement

EPA encourages you to ensure that your agency has a responsive and transparent community involvement process. We have found that when you are inclusive, meaning that you identify, invite, and include all interested stakeholders, you promote higher trust in the decision-making process. We encourage you to anticipate and respond to the community's concerns, fears, and points of confusion by being readily available, accessible, and quick to respond in your communications. We recommend promoting open and frequent two-way communication and practicing active listening with the community during public meetings and/or consultations. We find that the community is more engaged in

¹ Accessed online 6/24/19 at: <https://www.epa.gov/environmentaljustice/environmental-justice-and-national-environmental-policy-act>

² Accessed online 6/21/19 at: https://www.epa.gov/sites/production/files/2016-08/documents/nepa_promising_practices_document_2016.pdf

³ Quoted from p. 45-46 of the Promising Practices report. Accessed online 6/24/19 at: https://www.epa.gov/sites/production/files/2016-08/documents/nepa_promising_practices_document_2016.pdf

⁴ 'Generally accepted norms' is used in "Appendix A, Text of Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, Annotated with Proposed Guidance on Terms" which is attached to CEQ's Environmental Justice Guidance Under the National Environmental Policy Act (1997).

the process when government officials empathize with community members and other stakeholders by treating them with courtesy and respect when they discuss their issues with the project. We encourage you to tailor community involvement approaches and activities to meet community needs by speaking plainly and not using excessive technical jargon.

Source Water Protection Areas for Drinking Water

Public drinking water supplies and/or their source areas often exist on lands under federal management. The 1996 amendments to the Safe Drinking Water Act (SDWA) require federal agencies that manage lands that serve as drinking water sources to protect these source water areas. Source Water is untreated water from streams, rivers, lakes, springs, and aquifers that is used as a supply of drinking water. Source Water Areas are the sources of drinking water delineated and mapped by the states for each federally-regulated public water system.

State agencies have been delegated responsibility to conduct source water assessments and provide a database of information about the watersheds and aquifers that supply public water systems. We recommend that USACE contact the state agency (Department of Environmental Quality or Department of Human Health Services) responsible for developing and maintaining this database to help identify source water protection areas within or downstream of the project area. Databases may contain GIS and Access information of the watersheds and aquifer recharge areas, the most sensitive zones within those areas, and the numbers and types of potential contaminant sources identified for each system.

The EA should assess and address whether the decommissioning and dismantling of the Deactivated SM-1A Nuclear Reactor Facility will impact local drinking water sources. EPA anticipates that local stakeholders and community members may have concerns on the unlikely but concerning potential of radioactive waste or spent fuel reaching their water resources. As previously stated, we encourage you to have empathetic and clear conversations about the protective measures your agency will take while undergoing the decommissioning process. Therefore, EPA recommends that the draft EA:

- Identify all federally-regulated source water protection areas and state-regulated source water protection areas, if the state agency maintains that list, within or downstream of the project area.
- Identify all activities that could potentially affect source water areas.
- Identify all potential contaminants that may result from the proposed project.
- Identify all measures that would be taken to protect the source water protection areas in the draft EA.

Water Quality

Water quality degradation is one of EPA's primary concerns. Section 303(d) of the Clean Water Act (CWA) requires the State of Alaska to identify waterbodies that do not meet water quality standards and to develop water quality restoration plans to meet established water quality criteria and associated beneficial uses. Several such waterbodies may be present in the project area depending on the alignments and alternatives being analyzed. The EA should disclose which waters may be impacted, the nature of potential impacts, and specific pollutants likely to impact those waters. It should also report those waterbodies potentially affected by the project that are listed on the State's most current EPA-approved 303(d) lists. The EA should describe existing restoration and enhancement efforts for those waters, how the project will coordinate with on-going protection efforts, and any mitigation measures that will be implemented to avoid further degradation of water quality within impaired waters. Antidegradation provisions of the CWA apply to those waterbodies where water quality standards are

currently being met. This provision prohibits degrading the water quality unless an analysis shows that important economic and social development necessitates some degradation of water quality. The EA evaluation should determine how the antidegradation provisions would be met.

Transportation

The EA should address issues that fall under the Resource Conservation and Recovery Act regarding the potential residual radiological waste impacts from transportation including: possible exposures of transport workers and the general public along the proposed transportation routes, and radiation exposure to these groups that may occur through accidents along transportation corridors. Non-radiological impacts that the EA should discuss include traffic density, weight of the loaded truck or railcar, heat from the fuel cask, and transportation accidents. Your analysis should discuss transportation to greenfield sites, with close would require closer scrutiny since the proposed modes and routes may have not been addressed before. Transportation requirements may result in the need to modify/improve or expand existing highway, rail, barge, and intermodal facilities (if more than one mode is used to reach a given site). Impacts from these related activities should be addressed in the EA as well, in terms of both their construction and operation.

Disposal of Materials

Since purpose of the Proposed Action is to safely remove, transport, and dispose of all materials and equipment, structures, and residual contamination associated with the facility, we recommend detailed and non-technical discussion of how this process will proceed for the awareness of the public and the decision-maker. Clear and concise language will allow the public to understand how the appropriate precautions and methods for the facility, with its reactor components encased in concrete and in safe storage since the early 1973, to reasonably be allowed for unrestricted use in accordance with the radiological dose criteria established by the NRC at 10 CFR 20.1402 and adopted by the Army.

When considering waste disposal options, it should be disclosed in the EA how the preferred option is suitable for the specific site materials depending on the wastefrom, volume, and radioactivity of the waste. This may be an appropriate consideration when developing the alternatives analysis so the public and decision-maker may better understand USACE's decision-making process and the potential environmental impacts. If USACE anticipates that the residual contaminated material will be dealt with by appropriate shallow disposal techniques or deep geological disposal methods, EPA recommends that appropriate geological information to assure the public of the safety and practicability of this decision.

From: [Barber, Brenda M CIV USARMY CENAB \(USA\)](#)
To: [Taylor, Kevin \(Greenville\)](#); [Kiesling, Russell](#); [Taskovic, Aleksandra](#); [Bella, Elizabeth](#)
Cc: [Hillebrand, Jeffrey T CIV USARMY CENAB \(USA\)](#); [Watters, David J CIV USARMY CENAB \(US\)](#)
Subject: [EXTERNAL] FW: Request for Input on the Proposal to Decommission and Dismantle the Deactivated SM-1A Nuclear Reactor Facility at Army Garrison Alaska Fort Greely, Delta Junction, Alaska
Date: Friday, August 21, 2020 3:44:17 AM

Hi Team
See below input on SM-1A.

Very Respectfully,

Brenda M. Barber, P.E.
U.S. Army Corps of Engineers - Baltimore District
Program Manager - Environmental and Munitions Design Center
ATTN: CENAB-ENE-C
2 Hopkins Plaza
09-A-10 (Cube)
Baltimore, MD 21201
410-962-0030 (desk)
443-253-3048 (cell)

-----Original Message-----

From: Lemanski, Mateusz J LT [<mailto:Mateusz.J.Lemanski@uscg.mil>]
Sent: Thursday, August 20, 2020 7:10 PM
To: Barber, Brenda M CIV USARMY CENAB (USA) <Brenda.M.Barber@usace.army.mil>
Subject: Request for Input on the Proposal to Decommission and Dismantle the Deactivated SM-1A Nuclear Reactor Facility at Army Garrison Alaska Fort Greely, Delta Junction, Alaska

Good afternoon Ms. Barber,

Thank you for reaching out and seeking our input on this project.
At this early stage of the project I do not see any concerns, or need for input.
Naturally I am interested in reviewing the finalized Environmental Assessment.

I am looking forward to our further cooperation.

Very Respectfully,
LT Matt Lemanski
Waterways Management Division Chief
U.S. Coast Guard Sector Anchorage
Office: (907) 428-4189

-----Original Message-----

From: Hillebrand, Jeffrey T CIV USARMY CENAB (USA)
<Jeffrey.Hillebrand@usace.army.mil>
Sent: Wednesday, July 22, 2020 6:17 AM

To: Sector Anchorage Command Center <SectorAnchorage@uscg.mil>
Cc: Barber, Brenda M CIV USARMY CENAB (USA) <>
Subject: Request for Input on the Proposal to Decommission and Dismantle the
Deactivated SM-1A Nuclear Reactor Facility at Army Garrison Alaska Fort
Greely, Delta Junction, Alaska

Dear Sir,

Please see attached memo documenting our approach for the above mentioned project. We are in the early planning phases for this project and would your input. We can provide additional details as needed to facilitate your input.

Please provide any initial feedback by August 21, 2020 to Ms. Brenda Barber as indicated in the attached letter (also cc'd on this email). We hope to foster a collaborative relationship with all stakeholders as we progress with our planning and our future project implementation.

We look forward to hearing from you.

Very Respectfully,

Jeffrey Hillebrand
U.S. Army Corps of Engineers - Baltimore District Project Manager -
Environmental and Munitions Design Center
2 Hopkins Plaza
09-A-09 (Cube)
Baltimore, MD 21201
Office: (410) 962-1132
Work cell: (410) 598-1500

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NHPA Section 106 Consultation

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THE STATE
of **ALASKA**
GOVERNOR MIKE DUNLEAVY

Department of Natural Resources

DIVISION OF PARKS AND OUTDOOR RECREATION
Office of History & Archaeology

550 West 7th Avenue, Suite 1310
Anchorage, AK 99501-3561
907-269-8700

<http://dnr.alaska.gov/parks/oha>

January 22, 2021

File No.: 3130-1R COE-E / 2020-00760

Brenda Barber
U.S. Army Corps of Engineers – Baltimore District
2 Hopkins Plaza
Baltimore, MD 21201-2930
Brenda.M.Barber@usace.army.mil

Subject: Decommission and Dismantle the Deactivated SM-1A Nuclear Reactor Facility at U.S. Army Garrison Alaska Fort Greely, Alaska

Dear Ms. Barber:

The Alaska State Historic Preservation Office (AK SHPO) received your correspondence (dated December 18, 2020) regarding the subject project and report titled *SM-1A Reactor Decommissioning and Dismantlement Cultural Resources Technical Report, Fort Greely, Alaska* on December 21, 2020. Our office has reviewed the referenced undertaking under Section 106 of the National Historic Preservation Act.

We concur that the SM-1A Reactor Facility continues to contribute to the Fort Greely New Post Historic District (XMH-01275)/Fort Greely Cold War Historic District (XMH-00845) [Cold War HD]. We also concur that the facility is eligible for listing in the National Register of Historic Places (NRHP) under Criterion A with national significance for its association with the USACE's prototype nuclear power program during the Cold War era.

While our office concurs that the SM-1A Reactor Facility is an historic property, we noted that the resources that comprise the property are inconsistent between the descriptive narrative and the NRHP evaluation. The narrative described the facility to include: Building 606 (North and South, XMH-00670), J-5 Storage Building (Building 607, XMH-00671), Supply Wells #11 and #12, Recharge Well #13, the Utility Corridor, and Former Wastewater Pipeline. However, the facility was later defined in the NRHP evaluation to only include the resources within the property fence: Building 606 (North and South, XMH-00670), J-5 Storage Building (Building 607, XMH-00671), and Supply Well #11. Our office believes that the SM-1A Reactor Facility should include all of the properties that were necessary for the facility's function and should not be defined by contemporary property boundary of the Central Heating and Power Plant Facility. We strongly recommend that the SM-1A Reactor Facility receive an AHRS number to include a description of the resources that comprise the facility for management purposes.

Our office also agrees that the period of significance should include the expansion of the 1955 Central Heating and Power Plant facility to accommodate the use of a nuclear power source through the end of the test in 1972. Thus, we recommend that the period of significance for the SM-1A Reactor Facility be 1958-1972 to acknowledge the period of design and construction that led to criticality of the reactor in 1962.

As the proposed project will dismantle the SM-1A Reactor Facility, we concur that a finding of Adverse Effect is appropriate for the proposed undertaking. We also concur that following the demolition of Building 606 North and construction of two additions, that the remaining portion of Building 606 South (XMH-00670) will no longer retain sufficient integrity to contribute to the Cold War HD.

We look forward to working with your office and consulting parties to resolve the adverse effect through the development of a Memorandum of Agreement (MOA). In discussion with others in the office, potential mitigation could include the development of exhibits incorporating the commemorative plaques and time capsules, the development of other written or visual public interpretation product(s) that could be incorporated into the library system, and/or interviews with individuals who worked at the SM-1A Reactor Facility. Please note that the agency official shall notify the Advisory Council of the adverse effect finding (36 CFR 800.6[a][1]).

Thank you for the opportunity to comment. Please contact Sarah Meitl at sarah.meitl@alaska.gov if you have any questions or if we can be of further assistance.

Sincerely,



Judith E. Bittner
State Historic Preservation Officer

JEB:sjm

Project name:
Fort Greely SM-1A Decommissioning

To:
Brenda M. Barber, P.E.
U.S. Army Corps of Engineers Baltimore District
ATTN: CENAB-ENE-C
2 Hopkins Plaza
Baltimore, MD 21201

From:
Patience Stuart

Date:
June 3, 2020

Memo

Subject: Area of Potential Effects for the Fort Greely Deactivated SM-1A Nuclear Reactor Facility Decommissioning and Dismantlement Project, Delta Junction, Alaska

Introduction and Purpose

The U.S. Army Corps of Engineers (USACE) proposes to decommission and dismantle the deactivated Stationary Medium Power Model 1A (SM-1A) Nuclear Power Plant (SM-1A Reactor Facility) at United States Army Garrison Alaska, Fort Greely (Fort Greely) in the Southeast Fairbanks Census Area near Delta Junction, Alaska. The proposed decommissioning project (Project) is subject to Section 106 of the National Historic Preservation Act (54 United States Code (U.S.C.) § 300101 et seq.) as implemented in 36 Code of Federal Regulations (C.F.R.) Part 800. The USACE is the lead federal agency. The purpose of this memo is to establish the Project's Area of Potential Effect (APE).

Brief History and Description

Located in the central portion of Fort Greely's New Post along Arctic Avenue between First Street and East Fifth Street, the SM-1A Reactor Facility was a single-loop 20.2 megawatt-thermal pressurized water reactor that generated electrical power and produced steam to heat on-post facilities. Construction of SM-1A at Fort Greely began in 1958 and was completed in 1962. The reactor operated from 1962 to 1972 as part of the Army Reactor Program and was deactivated from 1972 to 1973 as part of the Army Deactivated Nuclear Power Plant Program.

To operate the facility, groundwater was drawn from one of two supply wells (Well No. 11 and Well No. 12) to cool and condense exhaust steam from the reactor's turbine, with the condensate being returned to the steam generator. Steam lines provided low-pressure steam used for heating the post, and the condensate was returned to the steam generator. The post laundry facility, formerly located in Building 675, reportedly received steam directly from the SM-1A Reactor Facility's secondary system.

Cooling water was originally discharged to Jarvis Creek via an approximately one-mile, one-inch diameter steel discharge line that ran to a dilution station (Well No. 14) and then through a 0.25-mile, 12-inch diameter steel pipe. This discharge structure was deactivated in 1968, and treated cooling water was then discharged to Recharge Well No. 13 (also referred to as the "dry well") from the facility's Radioactive Waste Discharge System (RWDS), a skid-mounted distillation system.

Fort Greely's sludge drying beds at its sewage treatment plant and a landfill (Landfill No. 7) active during the 1970s may also have been associated with radioactive materials that could have been disposed there during decommissioning or that contained sludge from the SM-1A Facility.

Following deactivation in 1973, the SM-1A reactor facility was placed in a safe storage (SAFSTOR) configuration that allows radioactivity to decay before dismantlement and decontamination. The deactivation consisted of removing the nuclear fuel,

minor decontamination, shipment of necessary radioactive waste, encasing other onsite radioactive materials in a sand/grout mixture, sealing the reactor vessel, and installing appropriate warning signs and monitoring devices. The vapor container was partially filled with a grout/sand mixture, and the hatch was sealed. The liquid radioactive waste discharge lines outside the SM-1A Reactor Facility fence line, which ran about 1 mile to a dilution station at Jarvis Creek, the dilution station, and 1,700 cubic feet of contaminated soil and concrete rubble were removed between 1997 and 1999 and documented in a Record of Decision (ROD) issued by USACE in 2009 (USAG Alaska 2009). Building 670 was used to temporarily store drummed waste soil generated during a 1991 remediation project inside the SM-1A Reactor Facility fence line.

Since its placement in SAFSTOR, the SM-1A Reactor Facility has been subject to regular inspection and monitoring by USACE in accordance with AR 50-7 and the SM-1A Reactor Possession Permit Number SM1A-1-19 and previous permits. Building 606 has remained occupied by government personnel and/or contractors operating Fort Greely's conventional steam and power plant.

The SM-1A Reactor Facility is a fenced, approximately 1.5-acre site that contains the reactor building (Building 606 North), a storage building used during facility operations (Building J-5/607), the spent fuel pit, and the vapor containment structure adjacent to 606 North. Well No. 11 is northwest of Building 606 North and within the existing perimeter fence. Supply well No. 12 is located outside the perimeter fence to the north. The south end of Building 606 (Building 606 South) is also within the fenced site and contains facilities operated by Fort Greely's on-site utility contractor, Doyon Utilities, LLC (Doyon). On 28 September 2007, the utility systems and infrastructure on Fort Greely were privatized through the award by Defense Logistics Agency to Doyon Utilities, LLC in a 50 year Contract No. #SP0600-07-C-8261 (the "UP Contract").

Doyon owns Building 606 (North and South) and Building J-5/607 and operates the installation's central heat and power plant, the heat distribution system and utilidors, the electrical distribution system, the water distribution system and treatment, and the wastewater distribution system and treatment plant. The United States Department of the Army manages the land underlying Building 606 and Building J-5/607. Doyon uses Building 606 North primarily for office and storage space, but the building also contains key infrastructure needed to operate the utilities systems, including electrical switchgear, battery charging stations, water softening systems, and backup treated water for the boilers. This infrastructure is original to the operations of the SM-1A Reactor Facility.

Project Description

USACE maintains the SM-1A Reactor Facility in accordance with Army Regulation (AR) 50-7 and the current Reactor Possession Permit No. SM1A-1-19 issued by the United States Army Nuclear and Countering Weapons of Mass Destruction Agency (USANCA). Under the USACE's Deactivated Nuclear Power Plant Program, decommissioning a nuclear reactor is required within 60 years of its final shutdown to comply with AR 50-7. The deactivated and defueled SM-1A Reactor Facility has been in a SAFSTOR condition and subject to regular inspection and monitoring for 48 years. The Project would accomplish this objective by decommissioning the SM-1A Reactor Facility to a standard that allows for release of the site for unrestricted use and terminate the USANCA Decommissioning Permit for SM-1A.

The Project would remove, transport, and dispose of all materials and equipment, structures, and residual contamination; and abandon all wells associated with the SM-1A Reactor Facility in compliance with Alaska Department of Environmental Conservation (ADEC) Drinking Water Regulations (18 Alaska Administrative Code [AAC] 80.015e). Facility structures would be dismantled, including Building 606 North, which contains the vapor container, spent fuel pit, waste tank pit, and upper and lower levels of the reactor operations area. In addition, Building J-5/607 would be demolished.

Recharge and supply wells, impacted soils, and underground utilities would be removed and/or abandoned in place. Well #11 (inside the facility fence) would be abandoned in place, but the structure and some subsurface casing would be removed. The above ground structural components of the Wells #12 and #13 (outside the facility fence) would be removed with the casing left in place and abandoned. The main waste pipeline outside the fence was removed in the 1990s. A small run of this 12-inch diameter steel pipe inside the fence would be removed. The parking lot immediately north of Building 606 North, and one or more areas yet to be determined would be used as temporary lay-down staging areas.

Aside from Wells #12 and #13, the Project would not affect other structures previously associated with the SM-1A Reactor Facility that are outside of the facility fence, including Building 670, Building 675, Landfill #7, or the sludge drying areas. These structures would be addressed in the Project's decommissioning plan, but no further action would occur.

Once dismantled, materials and waste would be segregated and/or prepared onsite for transport to an appropriate permitted disposal or recycling facility. The decommissioning of the SM-1A Reactor Facility would reduce residual radioactivity to levels

that allow USACE to release the site for unrestricted use as defined in 10 C.F.R. Part 20.1402, *Radiological Criteria for License Termination* and allow USACE to restore the site to support the mission of Fort Greely's on-site utility contractor, Doyon.

During the decommissioning, Doyon would continue to occupy Building 606 South. The Project requires the reconfiguring of utility corridors and building modifications to maintain utility services and workspaces during Project activities. A permanent addition would be constructed at the southeast corner of Building 606 South after demolition of an existing non-structural shelter is removed; temporary modular trailers would be added to the southwest corner of the building to house Doyon's administrative needs during the project implementation. Utilities would be reconfigured from Building 606 North to Building 606 South to ensure no disruptions to the installation's utility services.

Following the dismantlement of the SM-1A Reactor Facility, a new addition would be built at the north end of Building 606 in the approximate footprint of the prior space so that Doyon can re-occupy the space and continue to implement the supply of Fort Greely's utility operations.

Area of Potential Effect

The APE is established as the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties. The potential effects to historic properties from the Project include the demolition of buildings and structures, limited excavation in previously disturbed soils, changes to the setting, and noise and vibration from construction vehicles. Taking these potential effects into account, the Project APE is defined as the SM-1A Reactor Facility, containing the fenced site that includes Building 606 North, Building 606 South, Building J-5/607, Supply Well #11, and a portion of the former wastewater pipeline, as well as Supply Well #12 and Recharge Well #13 outside the fence. The APE does not include facility components not affected by the Project, including Building 675, Building 670, Landfill #7 and sludge drying areas (Table 1, Figures 1-4) (USACE 2008). Direct and/or indirect Project effects are not expected to extend beyond the fenced-in portions of the site and the two wells located outside the fence.

Based on a review of the Alaska Office of History and Archaeology's Alaska Heritage Resources Survey (AHRS) and USAG Alaska's Integrated Cultural Resources Management Plan (ICRMP), the APE is within the Fort Greely New Post Historic District (AHRS XMH-1275) and the Fort Greely Cold War Historic District (AHRS XMH-845) (AHRS 2020; USAG Alaska 2020). Research indicates that, although two AHRS site numbers exist, XMH-1275 and XMH-845 refer to the same historic district and geographic boundary. The Fort Greely New Post/Cold War Historic District was inventoried from 1997 to 2000 as part of a proposed realignment of Fort Greely, the results of which were included in a Memorandum of Agreement (MOA) signed in 2000 by the Army and SHPO and was determined eligible for the NRHP in 2000 under Criterion A with a period of significance of 1946-1989 (AHRS 2020). The district contains 23 contributing buildings and three non-contributing buildings; three additional buildings have been demolished (USAG Alaska 2020; AHRS 2006). Building 606 (AHRS XMH-670) was determined eligible for the NRHP as a contributing resource to the historic district. The J-5 Storage Building/Building 607 (AHRS XMH-671) was determined not eligible for the NRHP and is non-contributing to the historic district (AHRS 2020).

Following the determination of an APE for the Project, further analysis will occur to assess the NRHP-eligibility of the SM-1A Reactor Facility (individually and as a contributing resource to the historic district), as well as Project effects to historic properties. The analysis will not include consideration of stipulations recorded in the 2000 MOA, based on communication from the Army stating that this agreement is now considered null and void.

Table 1. SM-1A Reactor Facility Components

SM-1A Reactor Facility Component	Inside fenced site	Outside fenced site	Project Actions	In APE
Building 606 North (primary SM-1A Reactor Facility building, includes vapor container, spent fuel pit, waste tank pit, and upper and lower levels of the reactor operations area) (AHRS XMH-670)	X		Demolish	Yes
Building 606 South (steam power plant) (AHRS XMH-670)	X		Modify for continued use during decommissioning; demolish small addition at southeast corner; re-route utilities from Building 606 North.	Yes

SM-1A Reactor Facility Component	Inside fenced site	Outside fenced site	Project Actions	In APE
Building J-5/607 (storage) (AHRS XMH-671)	X		Demolish	Yes
Cooling Water Supply Well #11	X		Close and abandon in place; remove well structure and some subsurface casing	Yes
Cooling Water Supply Well #12		X	Close and abandon in place; remove well structure	Yes
Recharge Well #13 (received wastewater during facility operation)		X	Close and abandon in place; remove well structure	Yes
Pipeline to Jarvis Creek/Dilution Station at Jarvis Creek (received wastewater; removed and remediated in mid 1990s)	X	X	Remove within fence site; previously removed outside fence site as part of BRAC (USACE 2009).	Yes
Building 675, (Former Post Laundry temporarily received steam-powered directly from Building 606; currently a warehouse) (AHRS XMH-711)		X	Address in Decommissioning Plan; no further action	No
Landfills and sludge drying beds (may have been associated waste during SM-1A Reactor Facility operations in 1970s)		X	Address in Decommissioning Plan; no further action	No
Building 670 (stored waste soil during remediation efforts in 1991) (AHRS XMH-710)		X	Address in Decommissioning Plan; no further action	No

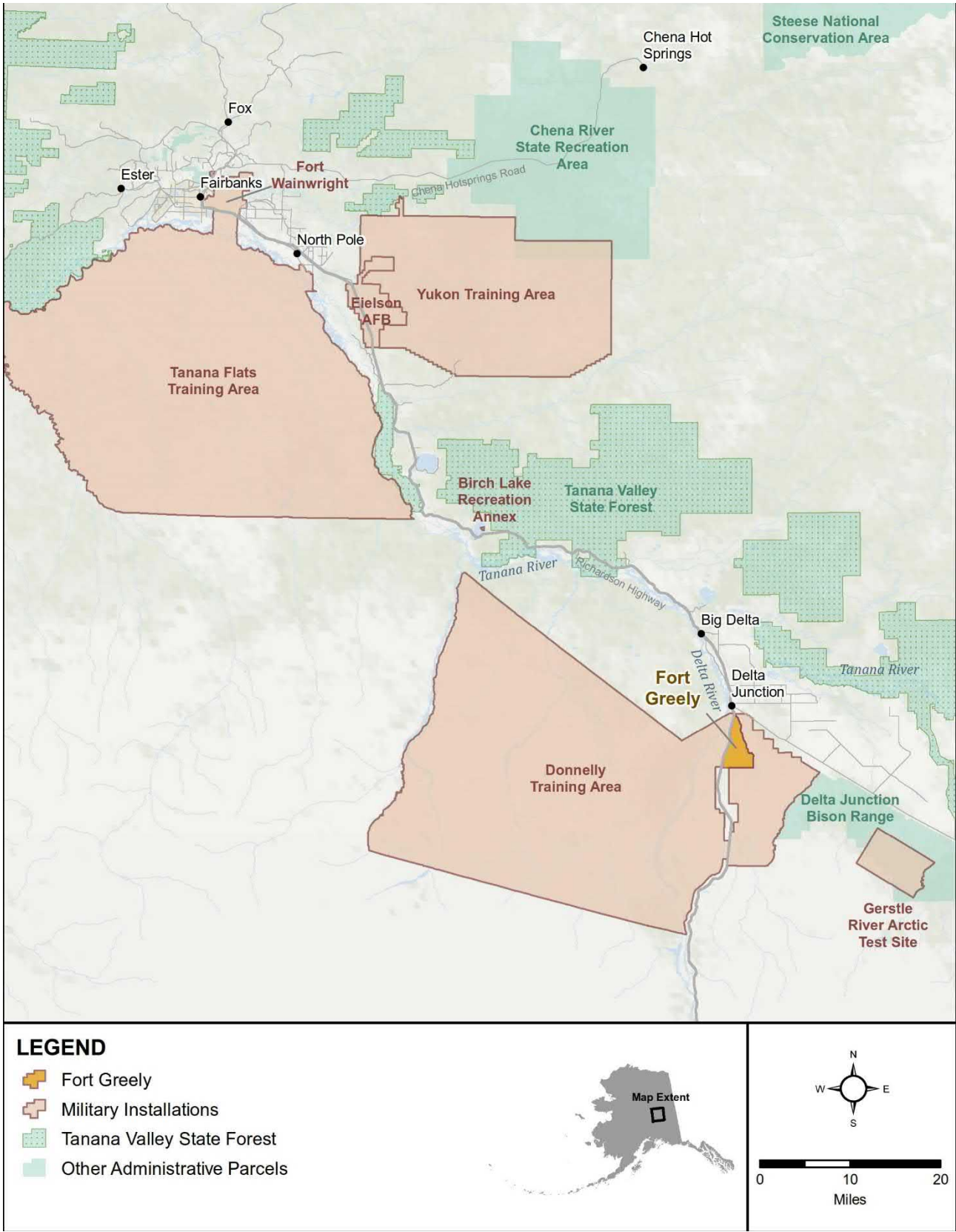


Figure 1. Location of Fort Greely

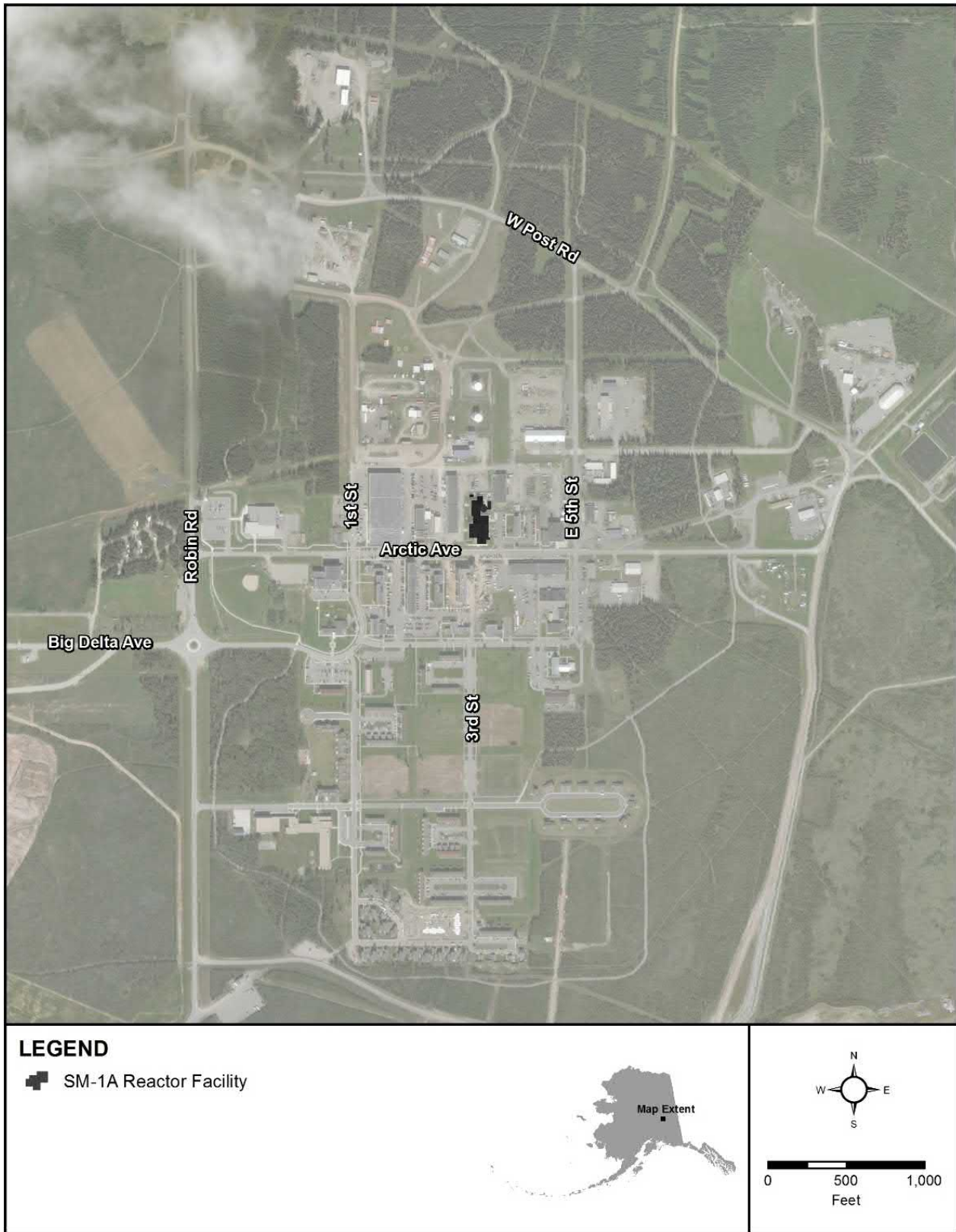
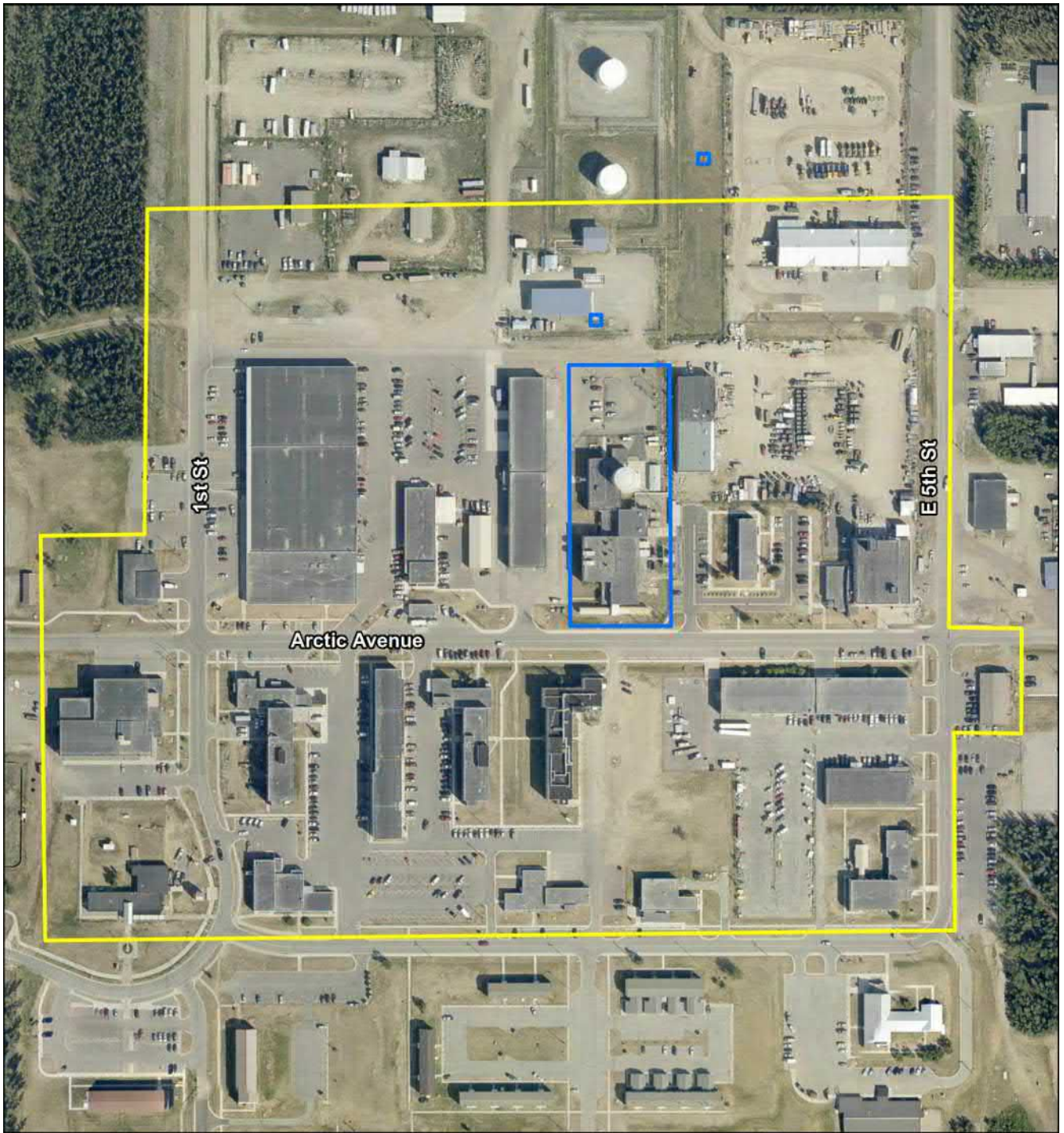




Figure 2. Location of SM-1A Reactor Facility



Figure 3. Project Area of Potential Effects



LEGEND

-  Project Area of Potential Effect
-  Fort Greely Historic District

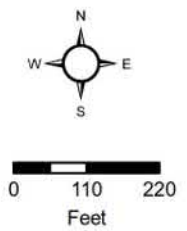


Figure 4. Project Area of Potential Effects within Fort Greely Historic District (district boundaries from AHRS XMH-1275).

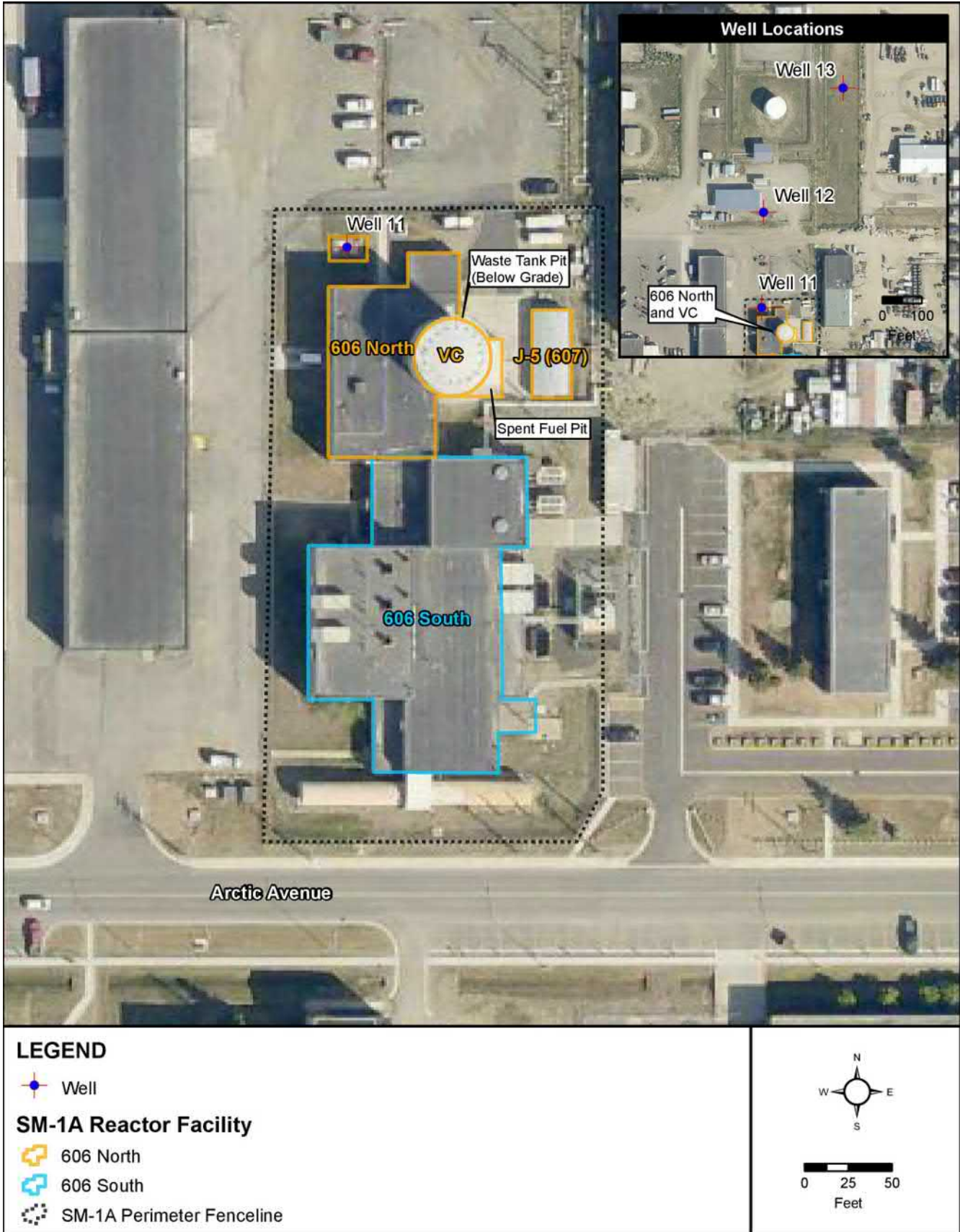


Figure 5. SM-1A Reactor Facility Components within Project APE

References

- AHRS (Alaska Heritage Resources Survey). 2020. Online site forms for XMH-670, XMH-671, XMH-710, XMH-711, XMH-1275.
- USACE. 2008. Final Historical Site Assessment (Phase I) for all Hazards Assessment of the SM-1A Deactivated Nuclear Power Plant at Fort Greely, Alaska. Prepared for U.S. Army Corps of Engineers. May.
- USACE. 2020. SM-1A Nuclear Power Plant Overview. Available at: <https://www.nab.usace.army.mil/SM-1A/> (accessed June 1, 2020).
- U.S. Army Garrison Alaska. 2009. Final Record of Decision, Nine Installation Restoration Program Sites, Fort Greely, Alaska. Available at: <https://dec.alaska.gov/spar/csp/sites/fort-greely/> (accessed June 1, 2020).
- U.S. Army Garrison Alaska. 2020. Integrated Cultural Resources Management Plan for U.S. Army Garrison Alaska, 2020-2025.



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201-2930

CENAB-ENE-C

June 19, 2020

Ms. Sarah Meitl
Review and Compliance Coordinator
Alaska State Historic Preservation Office/Office of History and Archaeology
550 West Seventh Avenue, Suite 1310
Anchorage, AK 99501-3561

SUBJECT: Request to Initiate Consultation and Determine the Area of Potential Effect for the Proposal to Decommission and Dismantle the Deactivated SM-1A Nuclear Reactor Facility at U.S. Army Garrison Alaska, Fort Greely, Delta Junction, Alaska

The United States Army Corps of Engineers (USACE) proposes to decommission and dismantle the Deactivated SM-1A Nuclear Reactor Facility at U. S. Army Garrison Alaska, Fort Greely, Delta Junction, Alaska. The proposed decommissioning project (Project) is subject to Section 106 of the National Historic Preservation Act (54 U.S.C. § 300101 et seq.), as implemented in 36 C.F.R. Part 800. USACE is the lead federal agency.

Consistent with 36 C.F.R. Part 800, USACE would like to initiate consultation and solicit comments from the Alaska State Historic Preservation Officer (SHPO) concerning the Project's Area of Potential Effects (APE) as determined in the attached memo.

The purpose of the Project is to safely remove, transport, and dispose of all materials and equipment, structures, and residual contamination associated with the facility. The facility operated from 1962 to 1972 before being deactivated. The undertaking is needed because in its current state, the facility does not support the Army's current and future mission at Fort Greely.

USACE welcomes your comments concerning the APE. Following consultation on the APE, USACE will submit a Cultural Resources Technical Report that will include a Determination of Eligibility for the SM-1A Reactor Facility and findings of potential Project effects to historic properties. If you have any questions or comments on the project, please contact the Project's Manager, Brenda Barber, USACE at 410-962-0030 or via email at Brenda.M.Barber@usace.army.mil.

Sincerely,

Brenda M. Barber, P.E.
U.S. Army Corps of Engineers
Program Manager

Attachment: Area of Potential Effect Memo

From: Barber, Brenda M CIV USARMY CENAB (USA) <Brenda.M.Barber@usace.army.mil>
Sent: Friday, July 17, 2020 5:40 AM
To: Bellion, Tara
Cc: Kiesling, Russell; Hillebrand, Jeffrey T CIV USARMY CENAB (USA)
Subject: [EXTERNAL] FW: Request to Initiate Consultation

Tara,
See below. Let's proceed with consultation.

Very Respectfully,

Brenda M. Barber, P.E.
U.S. Army Corps of Engineers - Baltimore District Program Manager - Environmental and Munitions Design Center
ATTN: CENAB-ENE-C
2 Hopkins Plaza
09-A-10 (Cube)
Baltimore, MD 21201
☎ 410-962-0030 (desk)
☎ 443-253-3048 (cell)

-----Original Message-----

From: Meitl, Sarah J (DNR) [<mailto:sarah.meitl@alaska.gov>]
Sent: Thursday, July 16, 2020 7:46 PM
To: Barber, Brenda M CIV USARMY CENAB (USA) <Brenda.M.Barber@usace.army.mil>
Cc: Hillebrand, Jeffrey T CIV USARMY CENAB (USA) <Jeffrey.Hillebrand@usace.army.mil>; Falls, Eva E CIV USARMY CENAB (USA) <Eva.E.Falls@usace.army.mil>; Cook, Elizabeth A CIV (USA) <elizabeth.a.cook80.civ@mail.mil>; Meitl, Sarah J (DNR) <sarah.meitl@alaska.gov>
Subject: [Non-DoD Source] RE: Request to Initiate Consultation

File No. 3130-1R COE-E / 2020-00760

Good afternoon,

The Alaska State Historic Preservation Office received your correspondence (dated June 19, 2020) on June 24, 2020. Following our review of the documentation provided in the initiation letter, we have no objections to the defined area of potential effect (APE) or level of effort proposed for identification at this time and look forward to receiving the Cultural Resources Technical Report.

Thank you for sending a Section 106 consultation initiation letter to our office. Please let me know if we can be of further assistance.

Best,
Sarah

Sarah Meitl
Review and Compliance Coordinator
Alaska State Historic Preservation Office Office of History and Archaeology

550 West 7th Avenue, Suite 1310
Anchorage, AK 99501-3561
Direct: 907-269-8720
sarah.meitl@alaska.gov
Blocked <http://dnr.alaska.gov/parks/oha>
Teleworking - Email is the best method of communication.

-----Original Message-----

From: Barber, Brenda M CIV USARMY CENAB (USA) <Brenda.M.Barber@usace.army.mil>
Sent: Friday, June 19, 2020 3:20 PM
To: Meitl, Sarah J (DNR) <sarah.meitl@alaska.gov>
Cc: Hillebrand, Jeffrey T CIV USARMY CENAB (USA) <Jeffrey.Hillebrand@usace.army.mil>; Falls, Eva E CIV USARMY CENAB (USA) <Eva.E.Falls@usace.army.mil>; Cook, Elizabeth A CIV (USA) <elizabeth.a.cook80.civ@mail.mil>
Subject: Request to Initiate Consultation
Importance: High

Hello Sarah,
Please see attached letter in which we will be requesting the start of the consultation process for the SM-1A Nuclear Reactor Facility located at U.S. Army Garrison Alaska, Fort Greely, Delta Junction. The US Army Corps of Engineering is proposing an action to decommissioning and dismantle the reactor site.

Additionally, I have included the memo regarding the Area of Potential Effect for the proposal to decommission and dismantle the site.

We welcome your input on the attached and look forward to working with you on this process.

Very Respectfully,

Brenda M. Barber, P.E.
U.S. Army Corps of Engineers - Baltimore District Project Manager - Environmental and Munitions Design Center
ATTN: CENAB-ENE-C
2 Hopkins Plaza
09-A-10 (Cube)
Baltimore, MD 21201
☎ 410-962-0030 (desk)
☎ 443-253-3048 (cell)



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201-2930

December 18, 2020

Ms. Sarah Meitl
Review and Compliance Coordinator
Alaska State Historic Preservation Office/Office of History and Archaeology
550 West Seventh Avenue, Suite 1310
Anchorage, AK 99501-3561

SUBJECT: SHPO ID NO: 2020-00760 Request for Concurrence for the Proposal to Decommission and Dismantle the Deactivated SM-1A Nuclear Reactor Facility at U.S. Army Garrison Alaska Fort Greely, Alaska

Dear Ms. Meitl:

The U.S. Army Corps of Engineers (USACE) would like to continue consultation with your office on the proposed undertaking to decommission and dismantle the Stationary Medium Power Model 1A Deactivated Nuclear Power Plant (SM-1A) at U. S. Army Garrison Alaska Fort Greely, Alaska. The proposed decommissioning project (Undertaking) is subject to Section 106 of the National Historic Preservation Act (54 U.S.C. § 300101 et seq.), as implemented in 36 C.F.R. Part 800. In accordance with 36 C.F.R. § 800.2(a)(2) the Department of the Army and Fort Greely have designated USACE as lead federal agency for purposes of Section 106.

USACE has determined the Undertaking will result in an Adverse Effect to historic properties. Consistent with 36 C.F.R. Part 800, USACE would like to solicit comments from the Alaska State Historic Preservation Officer (SHPO) concerning USACE's Determination of Eligibility for the SM-1A Reactor Facility and the Project Finding of Adverse Effect as determined in the attached cultural resources technical report. An AHRS site form update for the SM-1A Reactor Facility (AHRS XMH-670) is also included for your review and comment.

The purpose of the Undertaking is to safely remove, transport, and dispose of all materials and equipment, structures, and residual contamination associated with the facility. The facility operated from 1962 to 1972 before being deactivated. The Undertaking is needed to comply with Army Regulation 50-7 and ensure that decommissioning of SM-1A is completed within 60 years of its final deactivation.

USACE welcomes your consultation concerning the Undertaking's effects on historic properties and looks forward to working with you in the development of a Memorandum of Agreement to mitigate adverse effects to historic properties. If you have any questions or comments on the Undertaking, please contact the project's manager, Brenda Barber, USACE, at 443-253-3048 or via email at Brenda.M.Barber@usace.army.mil.

Sincerely,

Brenda M. Barber, P.E.
U.S. Army Corps of Engineers - Baltimore District
Program Manager - Environmental and Munitions Design Center

Attachments: Cultural Resources Report Cover Sheet

SM-1A Reactor Decommissioning Project Cultural Resources Technical Report

SM-1A Reactor Facility AHRS form

Appendix B—Air Quality

The Fort Greely SM-1A emissions inventory summary and calculations are provided in this appendix.

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**Fort Greely SM-1A
Fugitive Dust Emissions Inventory Summary**

Source	Uncontrolled Emissions (tons/yr)	
	PM₁₀	PM_{2.5}
Stockpile Fugitive Dust	0.06	0.02
Soil Export Fugitive Dust	2.81E-04	4.25E-05
Radioactive Soil Export Fugitive Dust	1.93E-04	2.93E-05
Soil Import Fugitive Dust	2.22E-04	3.37E-05
Wind Erosion	0.07	0.01
Site Preparation Fugitive Dust	1.33	--
Building Demolition Fugitive Dust	0.08	--
Total Uncontrolled Emissions (tons/yr)	1.54	0.03

Source	Controlled Emissions (tons/yr)	
	PM₁₀	PM_{2.5}
Stockpile Fugitive Dust	0.03	0.01
Soil Export Fugitive Dust	1.40E-04	2.12E-05
Radioactive Soil Export Fugitive Dust	9.67E-05	1.46E-05
Soil Import Fugitive Dust	1.11E-04	1.68E-05
Wind Erosion	3.52E-02	5.28E-03
Site Preparation Fugitive Dust	0.66	--
Building Demolition Fugitive Dust	0.04	--
Total Controlled Emissions (tons/yr)	0.77	0.01

Source	Uncontrolled Project Emissions (tons)	
	PM₁₀	PM_{2.5}
Stockpile Fugitive Dust	0.27	0.08
Soil Export Fugitive Dust	1.26E-03	1.91E-04
Radioactive Soil Export Fugitive Dust	8.71E-04	1.32E-04
Soil Import Fugitive Dust	1.00E-03	1.52E-04
Wind Erosion	0.32	0.05
Site Preparation Fugitive Dust	5.97	--
Building Demolition Fugitive Dust	0.08	--
Total Uncontrolled Project Emissions (tons)	6.64	0.13

Source	Controlled Project Emissions (tons)	
	PM₁₀	PM_{2.5}
Stockpile Fugitive Dust	0.14	0.04
Soil Export Fugitive Dust	6.31E-04	9.56E-05
Radioactive Soil Export Fugitive Dust	4.35E-04	6.59E-05
Soil Import Fugitive Dust	5.01E-04	7.58E-05
Wind Erosion	0.16	0.02
Site Preparation Fugitive Dust	2.98	--
Building Demolition Fugitive Dust	0.04	--
Total Controlled Project Emissions (tons)	3.32	0.07

Fugitive Dust Emissions - Stockpile Area
SM-1A

Stockpile

Area 7000 square feet
 Area 0.16 acres
 Percent Control 50%

Pollutant	Emission Factor	Uncontrolled Emissions		Controlled Emissions	
	ton/acre-yr	lb/hr	tpy	lb/hr	tpy
Total PM	0.38	0.014	0.06	0.007	0.03
PM10	0.38	0.014	0.06	0.007	0.03
PM2.5	0.114	0.004	0.02	0.002	0.01

Notes:

Total PM emission factor based on AP-42, Chapter 11.9 Western Surface Coal Mining (revised 10/98), Table 11.9-4

PM = PM10

PM2.5 = 0.3*PM10 Journal of the Air & Waste Management Association (2000) Vol. 50. Windblown Dust Contributes to High PM2.5 Concentrations

Acreage for stockpile and percent control are client provided

Conversion Factors:

2000 lbs/ton
 8760 hrs/yr

**Fugitive Dust Emissions - Soil Export
SM-1A**

Input Parameters:

Soil moved during exporting = 2900 cy
 Soil moved during exporting = 3457 tons
 Mean wind speed = 9.2 mph (Ft. Greely, Alaska; NOAA)
 Material moisture content = 14 % (Mean, USEPA AP42, Table 13.2.4, Page 13.2.4-2)
 Control efficiency = 50%

Emissions from rock/soil handling and storage piles (USEPA AP-42, Eq. 1, Section 13.2.4, January 1995)

EF = $k(0.0032)[(U/5)^{1.3} / (M/2)^{1.4}]$

3.43E-04 lb/ton	PM
1.62E-04 lb/ton	PM ₁₀
2.46E-05 lb/ton	PM _{2.5}

where:

EF = emission factor, lb/ton	Particle Size Multiplier (k)	30 μm	0.74
U = mean wind speed	<10 μm	0.35	
M = material moisture content (%)	<2.5 μm	0.053	
k = particle size multiplier			

Therefore, total emissions from rock/soil handling and storage =

EF* ton/yr of rock/soil loading/unloading			
1.19 lb/yr	5.93E-04 ton/yr	PM	
0.56 lb/yr	2.81E-04 ton/yr	PM ₁₀	
0.08 lb/yr	4.25E-05 ton/yr	PM _{2.5}	

Assume fugitive dust from stockpiles is controlled using water sprays.

Assume 50% control efficiency from water spray.

Therefore, actual controlled emissions from rock/soil handling and storage =

uncontrolled emissions * (1 - Control Efficiency %)			
2.97E-04 ton/yr	PM		
1.40E-04 ton/yr	PM ₁₀		
2.12E-05 ton/yr	PM _{2.5}		

Conversion Factors:

1.19 ton/cubic yard	(Soil/sandy loam, loose conversion found in Standard Volume-to-Weight Conversion Factors, EPA 2020:
2000 lbs/ton	https://www.epa.gov/sites/production/files/2016-03/documents/conversions.pdf)
8760 hrs/yr	
43560.17 sq ft / acre	

**Fugitive Dust Emissions - Soil Import
SM-1A**

Input Parameters:

Soil moved during importing =	2300 cy	
Soil moved during importing =	2742 tons	
Mean wind speed =	9.2 mph	(Ft. Greely, Alaska; NOAA)
Material moisture content =	14 %	(Mean, USEPA AP42, Table 13.2.4, Page 13.2.4-2)
Control efficiency =	50%	

Emissions from rock/soil handling and storage piles (USEPA AP-42, Eq. 1, Section 13.2.4, January 1995)

EF = $k(0.0032)[(U/5)^{1.3} / (M/2)^{1.4}]$	3.43E-04 lb/ton	PM
	1.62E-04 lb/ton	PM ₁₀
	2.46E-05 lb/ton	PM _{2.5}

where:

EF = emission factor, lb/ton	30 μm	0.74
U = mean wind speed	<10 μm	0.35
M = material moisture content (%)	<2.5 μm	0.053
k = particle size multiplier		

Therefore, total emissions from rock/soil handling and storage =

EF* ton/yr of rock/soil loading/unloading			
0.94 lb/yr	4.70E-04 ton/yr	PM	
0.44 lb/yr	2.22E-04 ton/yr	PM ₁₀	
0.07 lb/yr	3.37E-05 ton/yr	PM _{2.5}	

Assume fugitive dust from stockpiles is controlled using water sprays.
Assume 50% control efficiency from water spray.

Therefore, actual controlled emissions from rock/soil handling and storage =

uncontrolled emissions * (1 - Control Efficiency %)		
2.35E-04 ton/yr	PM	
1.11E-04 ton/yr	PM ₁₀	
1.68E-05 ton/yr	PM _{2.5}	

Conversion Factors:

<p>1.19 ton/cubic yard 2000 lbs/ton 8760 hrs/yr 43560.17 sq ft / acre</p>	<p>(Soil/sandy loam, loose conversion found in Standard Volume-to-Weight Conversion Factors, EPA 2020: https://www.epa.gov/sites/production/files/2016-03/documents/conversions.pdf)</p>
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**Fugitive Dust Emissions - Radioactive Soil Export
SM-1A**

Input Parameters:

Radioactive soil moved during exporting = 2000 cy
 Radioactive soil moved during exporting = 2384 tons
 Mean wind speed = 9.2 mph (Ft. Greely, Alaska; NOAA)
 Material moisture content = 14 % (Mean, USEPA AP42, Table 13.2.4, Page 13.2.4-2)
 Control efficiency = 50%

Emissions from rock/soil handling and storage piles (USEPA AP-42, Eq. 1, Section 13.2.4, January 1995)

$EF = k(0.0032)[(U/5)^{1.3} / (M/2)^{1.4}]$

3.43E-04 lb/ton	PM
1.62E-04 lb/ton	PM ₁₀
2.46E-05 lb/ton	PM _{2.5}

where:

EF = emission factor, lb/ton
 U = mean wind speed
 M = material moisture content (%)
 k = particle size multiplier

Particle Size Multiplier (k)

30 μm	0.74
<10 μm	0.35
<2.5 μm	0.053

Therefore, total emissions from rock/soil handling and storage =

EF* ton/yr of rock/soil loading/unloading		
0.82 lb/yr	4.09E-04 ton/yr	PM
0.39 lb/yr	1.93E-04 ton/yr	PM ₁₀
0.06 lb/yr	2.93E-05 ton/yr	PM _{2.5}

Assume fugitive dust from stockpiles is controlled using water sprays.
 Assume 50% control efficiency from water spray.

Therefore, actual controlled emissions from rock/soil handling and storage =

uncontrolled emissions * (1 - Control Efficiency %)

2.05E-04 ton/yr	PM
9.67E-05 ton/yr	PM ₁₀
1.46E-05 ton/yr	PM _{2.5}

Conversion Factors:

(Soil/sandy loam, loose conversion found in Standard Volume-to-Weight Conversion Factors, EPA 2020:
<https://www.epa.gov/sites/production/files/2016-03/documents/conversions.pdf>)

1.19 ton/cubic yard
 2000 lbs/ton
 8760 hrs/yr
 43560.17 sq ft / acre

**Fugitive Dust Emissions - Wind Erosion
SM-1A**

Assumptions and Variables used for Wind Erosion

Site Preparation			
Short-term disturbance	0.51	acres	
Short-term disturbance	2,044	square meters	
Threshold friction velocity (U_t)	1.33	m/s (2.97 mph)	for road (AP-42 Table 13.2.5-2 roadbed material)
days above threshold	6	days per year	2 minute wind is \geq 40 mph (disturbances/year)
Fastest Mile Wind Speed (U_{10}^+)	30.0	meters/sec (67 mph)	reported as average 2-minute wind speed for Fort Greely, Alaska
Control for Watering	50	% control	
Particle Size Multiplier (k)			
Maxium U_{10}^+ Wind (m/s)	30.0	30 μm	1.0
Maxium U^* Friction Velocity (m/s)	1.59	<10 μm	0.5
		<2.5 μm	0.075

Equations (AP-42 13.2.5.2 Industrial Wind Erosion)

Friction Velocity $U^* = 0.053 U_{10}^+$

Erosion Potential P ($g/m^2/period$) = $58*(U^*-U_t^*)^2 + 25*(U^*-U_t^*)$ for $U^*>U_t^*$, $P = 0$ for $U^* \leq U_t^*$

Emissions (tons/year) = $\frac{\text{Erosion Potential}(g/m^2/period)*\text{Disturbed Area}(m^2)*\text{Disturbances/year}*(k) * (1-\text{Control Efficiency } \%) / 100}{(453.6 \text{ g/lb}) * 2000 \text{ lbs/ton-year}}$

Pollutant	Site Prep
Erosion Potential (g/m^2)	10.4208
Uncontrolled PM_{10} (tons/yr)	0.070432
Uncontrolled $PM_{2.5}$ (tons/yr)	0.010565

Fugitive Dust Emissions - Site Preparation
SM-1A

Description:

Square feet of land disturbed:	22,000
Total acres of land disturbed:	0.51
Assumed number of 8-hr days ¹ :	262.5
Assumed equivalent acres/day:	1.92E-03
Percent Control:	50%

Equation for Fugitive Dust Emission (PM₁₀)²

$$E_{PM_{10}} \text{ (lb/yr)} = 20 \text{ lb/acre-day} * \text{Total Acres Disturbed} * \text{Number of 8-Hour Days} * (1 - \text{Emission Controls \%})$$

Uncontrolled Emissions Calculation

$$E_{PM_{10}} \text{ (lb/yr)} = 20 \text{ lb/acre-day} * 0.51 * 262.5$$

$$E_{PM_{10}} = 2651.50 \text{ lb/yr}$$

1.33 tpy
5.97 total uncontrolled tons PM₁₀¹

Controlled Emissions Calculation

$$E_{PM_{10}} \text{ (lb/yr)} = 20 \text{ lb/acre-day} * 0.51 * 262.5 * 0.5$$

$$E_{PM_{10}} = 1325.75 \text{ lb/yr}$$

0.66 tpy
2.98 total controlled tons PM₁₀¹

Assumptions:

¹ 4.5 years x 350 days/yr = 1,575 project days; assume 50% are excavation/demolition days; assume 12 hour work days

² Emission factors and methodology from USAFECC Air Emissions Guide For Air Force Transitory Sources (Section 4, August 2018).

Note: Assume PM = PM₁₀ = PM_{2.5}

Conversion Factors:

2000 lbs/ton
43560 sq ft / acre

Fugitive Dust Emissions - Building Demolition
SM-1A

Description:

Area of building to be demolished	6,107 ft ²
Height of building to be demolished	63 ft
Percent Control:	50%

Equation for Fugitive Dust Emission (PM₁₀)¹

$E_{PM_{10}} \text{ (lb/yr)} = 0.00042 \text{ lb/ft}^3 * \text{Area of building to be demolished} * \text{Height of building to be demolished} * (1 - \text{Emission Controls \%})$

Uncontrolled Emissions Calculation

$E_{PM_{10}} \text{ (lbs)} = 0.00042 \text{ lb/ft}^3 * 6,107 * 63$

$E_{PM_{10}} = 161.59 \text{ lbs}$

0.08 uncontrolled tons PM₁₀¹

Controlled Emissions Calculation

$E_{PM_{10}} \text{ (lbs)} = 0.00042 \text{ lb/ft}^3 * 6,107 * 63 * (1 - \text{Control Efficiency \%})$

$E_{PM_{10}} = 80.80 \text{ lb/yr}$

0.04 total controlled tons PM₁₀¹

Assumptions:

¹ Emission factors and methodology from USAFECC Air Emissions Guide For Air Force Transitory Sources (Section 4, August 2018).

² Demolition takes under containment. Emission calculations do not account for containment breaches.

Note: Assume PM = PM₁₀ = PM_{2.5}

Conversion Factors:

2000 lbs/ton

Fort Greely SM-1A
Fugitive Dust Emissions Inventory

Constant Values used through EI		
Description	value unit	Excel function
convert grams to lb	453.59 gram/lb	g_to_lb
convert lb to ton	2000 lb/ton	lb_to_ton
hours in a year	8760 hr	hr_in_year
convert kilograms to pounds	2.2046 kg/lb	kg_to_lb
convert g to kg	1000 g/kg	g_to_kg
convert lb to kg	0.45359 lb/kg	lb_to_kg
convert feet to miles	5280 ft/mil	ft_to_mil
convert acres to square meters	4046.86 acre/m ²	acre_to_m2
project length	4.5 years	project_length

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