PROJECT OVERVIEW FOR SM-1A FORT GREELY, AK

DEACTIVATED NUCLEAR POWER PLANT PROGRAM

Informational Meeting
Alaskan Native Tribes

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AGENDA

- Introduction and Welcome Remarks
- U.S. Army Nuclear Power Program; Deactivated Nuclear Power Plant Program
- Regulatory Framework for the Deactivated Nuclear Power Plant Program
- Historical Overview SM-1A
- Radiological Overview
- NEPA
- Section 106
- Decommissioning Planning and Implementation
- Closing Remarks

ACRONYMS

ACM – Asbestos-Containing Material

AEC – Atomic Energy Commission

ALARA – As Low as Reasonably Achievable

ANPP – Army Nuclear Power Program

ARP – Army Reactor Program

BRAC – Base Realignment and Closure

C&D – Construction and Debris

CEQ – Council on Environmental Quality

COPCs – Contaminants of Potential Concern

DEC – Department of Environmental Conservation

DOE – Department of Energy

DOD – Department of Defense

DOT – Department of Transport

EA – Environmental Assessment

EIS – Environmental Impact Statement

EPA – Environmental Protection Agency

EO – Executive Order

ESA – Endangered Species Act

kW – Kilowatts

LBP – Lead Based Paint

LLRW – Low Level Radioactive Waste

MARSSIM – Multi-Agency Radiation Survey and Site Investigation Manual

M&E – Materials and Equipment

MWt – Megawatt-Thermal

NEPA – National Environmental Policy Act

NHPA – National Historic Preservation Act

NRC – Nuclear Regulatory Commission

NRHP – National Register of Historic Places

PCB – Polychlorinated Biphenyl

RCRA - Resource Conservation and Recovery Act

ROPCs – Primary Radionuclides of Potential Concern

RPV – Reactor Pressure Vessel

SAFSTOR – Safe Storage

SHPO – State Historic Preservation Office

SM-1A – Stationary Medium Power Model 1A (Nuclear Reactor Facility)

TSCA – Toxic Substances Control Act

TPP – Technical Project Planning

US – United States

USACE – US Army Corps of Engineers

USANCA – US Army Nuclear and Countering Weapons of Mass Destruction Agency

USACHPPM – US Army Center for Health Promotion and Preventive Medicine

USC – United States Code

VC – Vapor Container

VLLRW – Very Low Level Radioactive Waste

WMD – Weapon of Mass Destruction

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INTRODUCTION AND WELCOME

- Brenda M. Barber, P.E. – Program Manager, Baltimore District, US Army Corps of Engineers
- David Watters, CHP – Senior Health Physicist, Baltimore District, US Army Corps of Engineers
- Elizabeth Cook - Cultural Resources Manager / Native Liaison USAG Alaska

US ARMY NUCLEAR POWER PROGRAM

- Established in 1954, the Army Nuclear Power Program (ANPP) was a joint effort between the US Army Corps of Engineers (USACE), Department of Defense (DOD), and the Atomic Energy Commission (AEC) to develop nuclear power plants for military use.
- In 1957 the ANPP developed its first prototype nuclear reactor, the SM-1, at Fort Belvoir, Virginia.
- Although the US Army discontinued the ANPP in 1976, it made a lasting contribution to the development of nuclear power in the US; the program was responsible for a number of important innovations in reactor design, containment and control structures, and nuclear health and safety programs.

US ARMY NUCLEAR POWER PROGRAM (CONT.)

The ANPP designed, built, and operated 8 reactors in the United States between 1957 and 1976.

Four Army reactors – Fort Belvoir (VA), Fort Greely (AK), Camp Century, Greenland and Sturgis Barge.

One Air Force reactor – Sundance Station, Wyoming

One Navy reactor – McMurdo Station, Antarctica

Two reactors at the National Reactor Testing Station, Idaho

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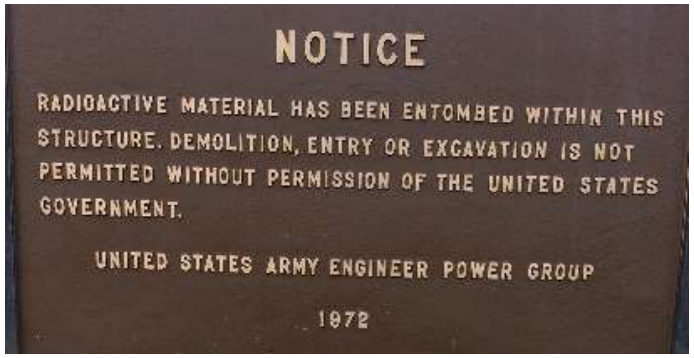
CURRENT REGULATORY FRAMEWORK AND OVERSIGHT

- Defense Utilization Facilities Authorized by Section 91.b. of the Atomic Energy Act of 1954
- Section 110.b. of the AEA Excludes DOD Utilization Facilities from AEC/Nuclear Regulatory Commission (NRC) Licensing
- Army Reactor Program (ARP) (AR 50-7)
- Compliance With Federal Standards Required
- Army Radiation Safety Program (DA PAM 385-24)
- USACE Developed Radiation Protection Programs
- Army Reactor Permits Issued to USACE by US Army Nuclear and Countering WMD Agency (USANCA) in G-3/5/7
- Army Reactor Council Provides Oversight

ARMY DEACTIVATED NUCLEAR POWER PLANT PROGRAM

USACE provides oversight, safeguarding, maintenance and ultimately decommissioning for two remaining US Army deactivated nuclear power plants:

- (1) SM-1A at Fort Greely
- (2) SM-1 at Fort Belvoir (decommissioning to begin in fall 2020)
- MH-1A aboard the STURGIS barge - decommissioning completed in 2019 by USACE team



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ARMY DEACTIVATED NUCLEAR POWER PLANT PROGRAM (CONT.)

USACE's key responsibilities include:

- Ensuring the security of the residual radioactive materials present in the reactors
- Ensuring the structural integrity of the facilities and performing required maintenance
- Performing environmental monitoring to ensure exposure to the public is below limits and 'As Low As Reasonably Achievable' (ALARA)
- Planning and performing final decommissioning within 60 years post-shutdown

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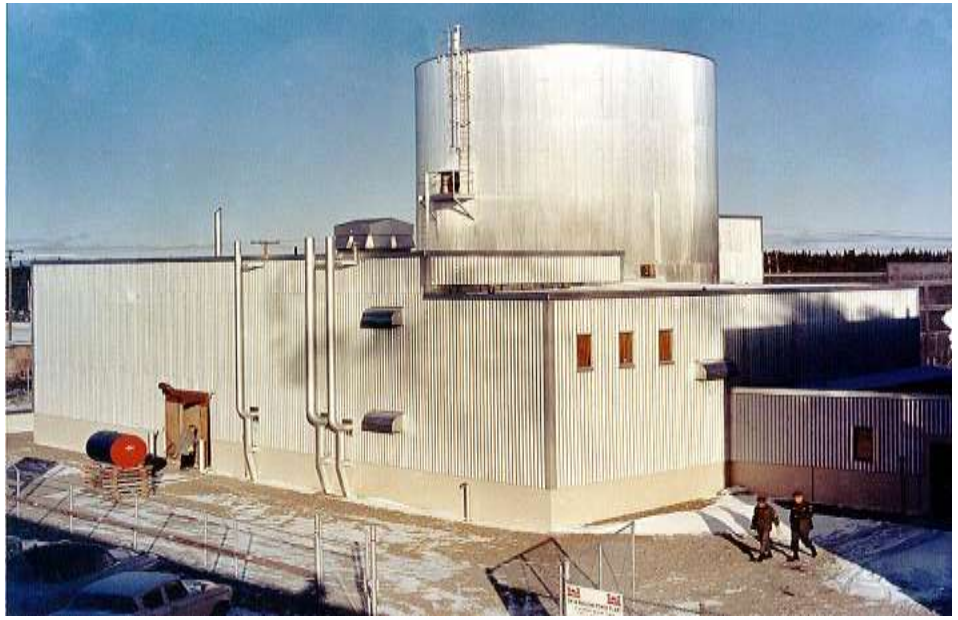
SM-1A OPERATING HISTORY

- SM-1A was built on Fort Greely, Alaska, between 1958 - 1962. It was designed, constructed, and operated as part of the Army Nuclear Power Program.
- It was a single-loop, 20.2 MWt pressurized water reactor that used highly enriched uranium dioxide fuel to generate 2,000 kW 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.
- SM-1A was also used as an in-service test facility to understand how the equipment would function in an arctic environment.



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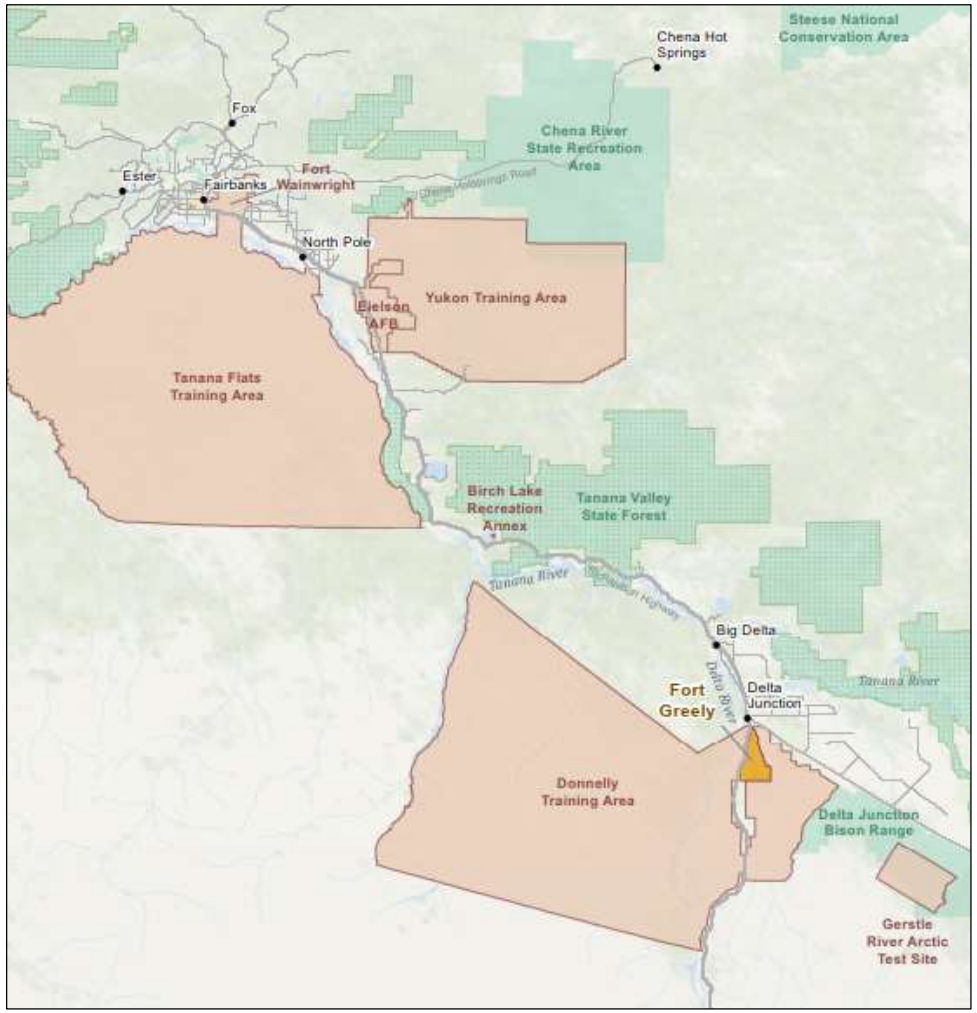
FORT GREELY AND SM-1A LOCATION



LEGEND

- Fort Greely
- Military Installations
- Tanana Valley State Forest
- Other Administrative Parcels

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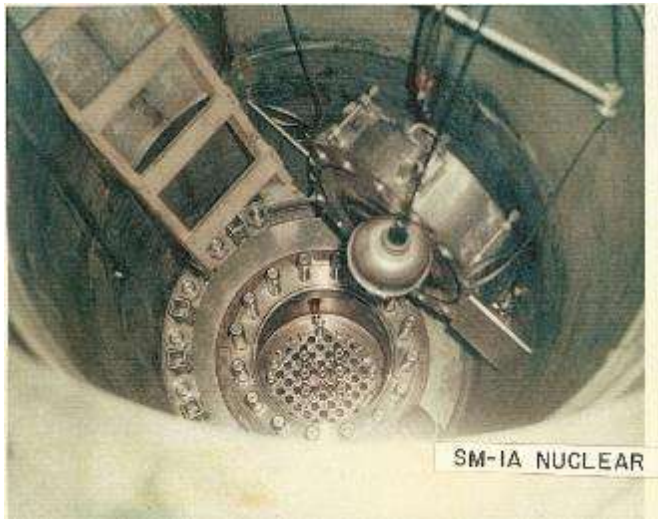
SM-1A TIMELINE: DETAILS

- SM-1A Construction Start: 1958
- SM-1A Reactor Startup: March 1962
  - Core II installed: April 1964
  - Core III installed: Jan 1966
  - Core IV installed: Aug 1970
- Pressure Vessel Annealed: Aug 1967
- Last Operation: March 1972
- Minimal Decommissioning and Entombment: 1973
  - Deactivated, reactor areas encased, secondary systems converted to fuel boilers
- USACHPPM Survey: June 1997
- BRAC Pipeline and Dilution Well Removal: 1997-2000
- Core Component Activation Analysis: 2008
- USACE Historical Site Assessment: 2008
- USACE Gamma Walkover Report: 2011
- USACE Characterization Survey Report: 2014



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INITIAL DEACTIVATION AND ENCASEMENT ACTIVITIES

- Decommissioning activities are documented in the May 1974 Decommissioning Report
- Fuel, control-rods, absorber elements, and neutron sources were shipped off site
- Primary and secondary system was flushed with a chemical solution
- Fuel handling structure over the spent-fuel pit was removed
- Dilution station capped after it was filled with sand
- Demineralizer Room sealed
  - Waste placed in Demineralizer Room
- Removed wastewater pipeline & dilution station
  - 1997 BRAC action and site closed with a Record of Decision

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SM-1A DEACTIVATION AND ENCASEMENT HISTORY

- The SM-1A decommissioning process began upon the reactor's final shutdown in March 1972.
- The initial deactivation of SM-1A consisted of placing the facility in a safe storage (SAFSTOR) configuration, after which it was maintained and monitored in a condition that allows radioactivity to decay over time.
- 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.
- Site is still operational as the Central Heating Plant for the Fort Greely Installation; Doyon Utilities owns and operates the utility plant at the site.

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SM-1A TIMELINE OF ACTIVITIES

1958	March 1962	August 1967	March 1972	1973	June 1997	1997 - 2000
SM-1A Construction Start	SM-1A Reactor Startup • Core II: April 1964 • Core III : Jan 1966 • Core IV: Aug 1970	Pressure Vessel Annealed	Last Operation	Minimal Deactivation & Entombment	USACHPPM Survey	BRAC Pipeline & Dilution Well Removal

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SM-1A TIMELINE OF ACTIVITIES (CONT.)

2008
- Core Component Activation Analysis
- USACE Historical Site Assessment

2011
- USACE Gamma Walkover Report

2014
- USACE Characterization Survey Report

2018
- Decommissioning Planning Award

2019; 2020
- Additional Characterization Effort

2021
- Draft Environmental Assessment

2022
- Decommissioning Contract Award

Decommissioning is expected to take 6 years to complete – target completion by FY28

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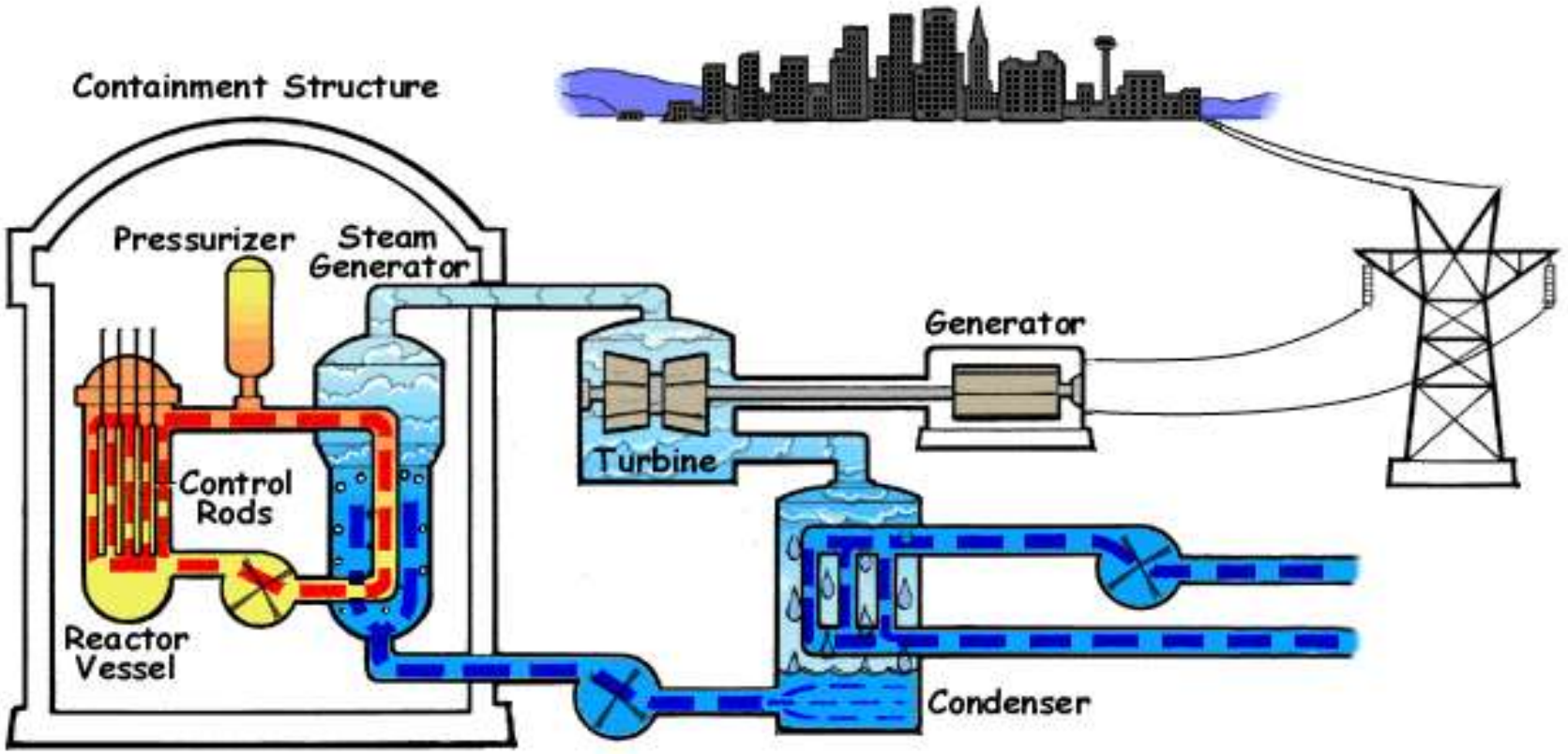
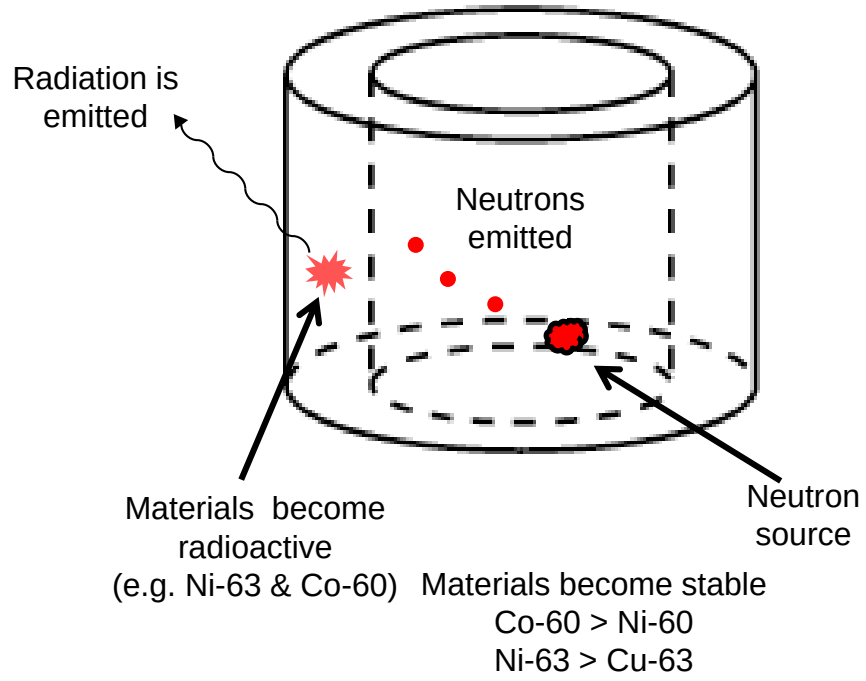
TYPICAL PRESSURIZED WATER REACTOR OPERATIONS



SM-1A PRIMARY RADIONUCLIDES

- Primary radionuclides are activation products
- Co-60 – emits beta and gamma radiation
- Ni-63 – emits low-energy beta radiation
- Most of the activity is in the form of radioactive metal in the reactor pressure vessel and the primary shield tank
- Small amounts of activity is present in the form of contamination on or within debris and soils (primarily Cs-137 and Sr-90)



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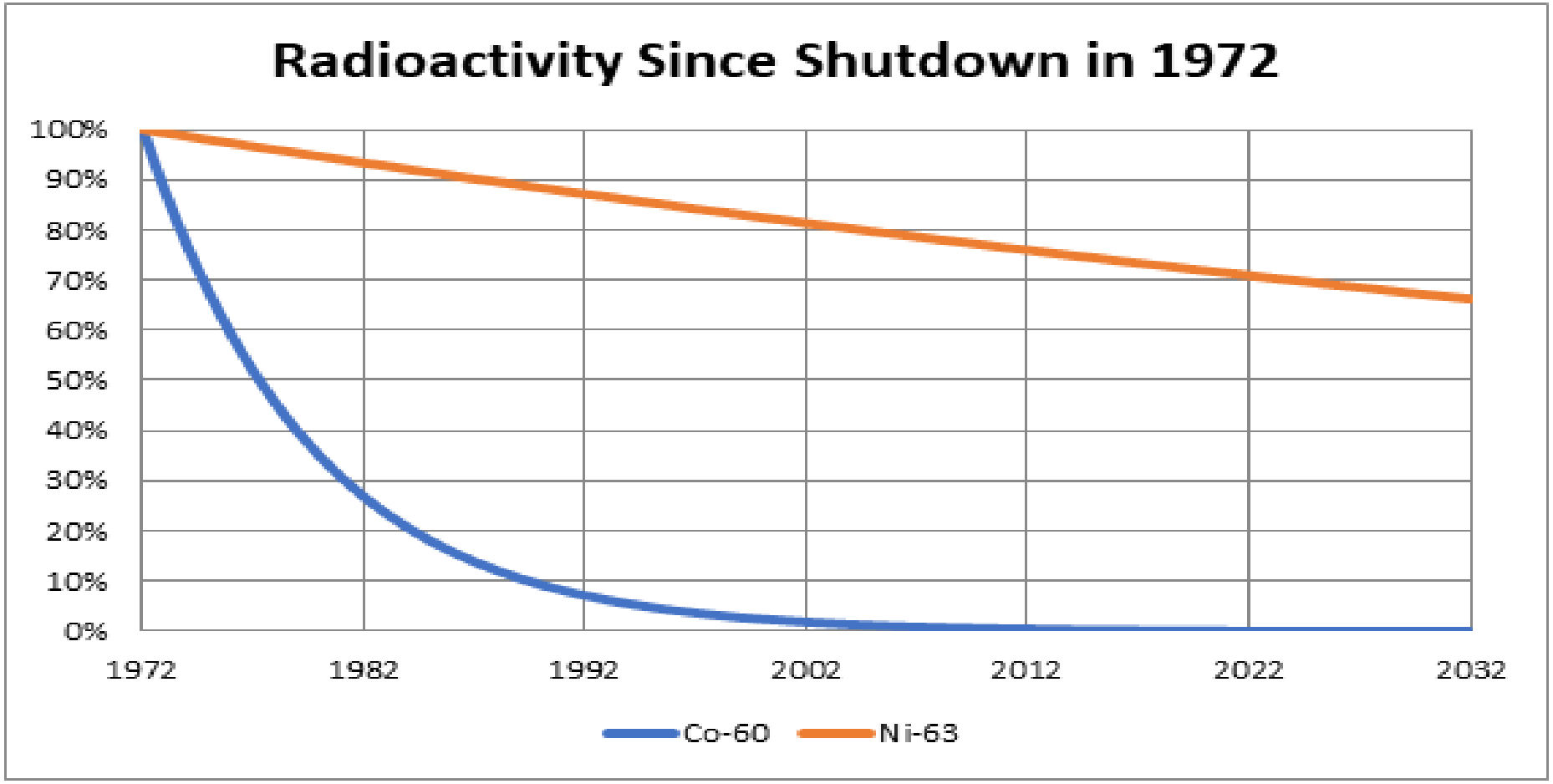
RADIOACTIVE DECAY SINCE SHUTDOWN



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ROPCS AND COPCS

ROPCs – Primary Radionuclides of Potential Concern (half-lives > 5 years)

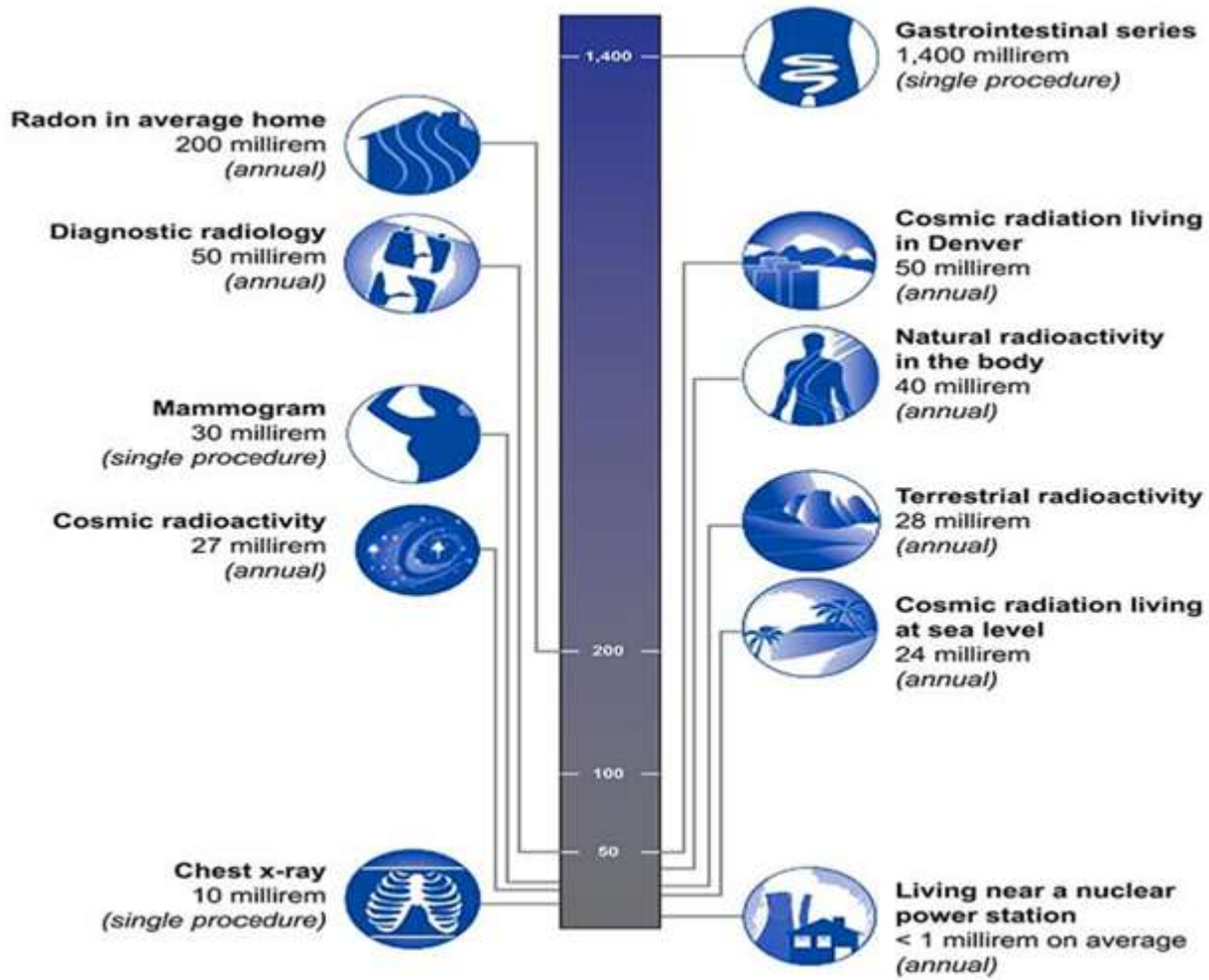
- Soil and/or building materials: H-3, Sr-90, Tc-99, Cs-137
- Primary and secondary systems: Co-60, Sr-90, Cs-137
- Activated metals: Co-60, Ni-63
- Activated concrete: Eu-125, Eu-154

COPCs – Contaminants of Potential Concern

- Building materials: Asbestos, lead-based paint, PCBs
- PCB transformers removed in 1994
- Shielding materials: elemental lead
- Soil: Lead, petroleum-based hydrocarbons (diesel fuel spills)

RADIOLOGICAL FUNDAMENTALS SOURCES OF RADIATION EXPOSURE

- Since the beginning of time, all living creatures have been, and are still being, exposed to radiation.
- Nonetheless, most people are not aware of all the natural and man-made sources of radiation in our environment.



Average dose to individual in US is <u>620</u> mrem/yr

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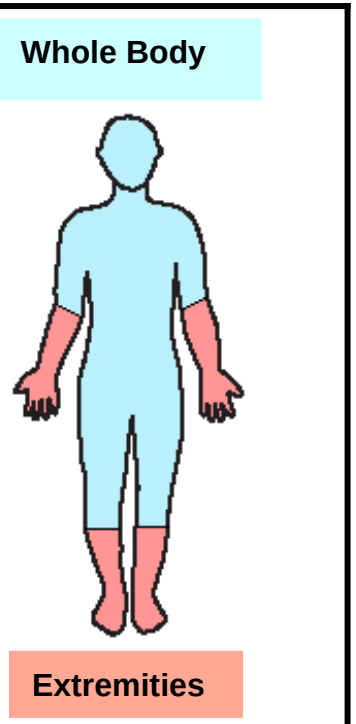
RADIATION DOSE LIMITS

- Occupational and Public Dose Limits

Type of exposure	NRC Limits (mrem/y)		
	Adult Worker	Minor Worker	Member of the General Public
Whole Body	5,000	500	100
Organ or Tissue	50,000	5,000	N/A
Lens of the Eye	15,000	1,500	N/A
Skin or Extremity	50,000	5,000	N/A
Embryo/Fetus (of a declared pregnant worker)	500	N/A	N/A



- NRC Decommissioning Criteria to be used for the SM-1A is 25 mrem/y
- Free release of material and equipment for recycle is 1 mrem/y

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AFFECTED AREAS OF SM-1A

LEGEND

- Well

SM-1A Reactor Facility

- 606 North
- 606 South
- SM-1A Perimeter Fenceline

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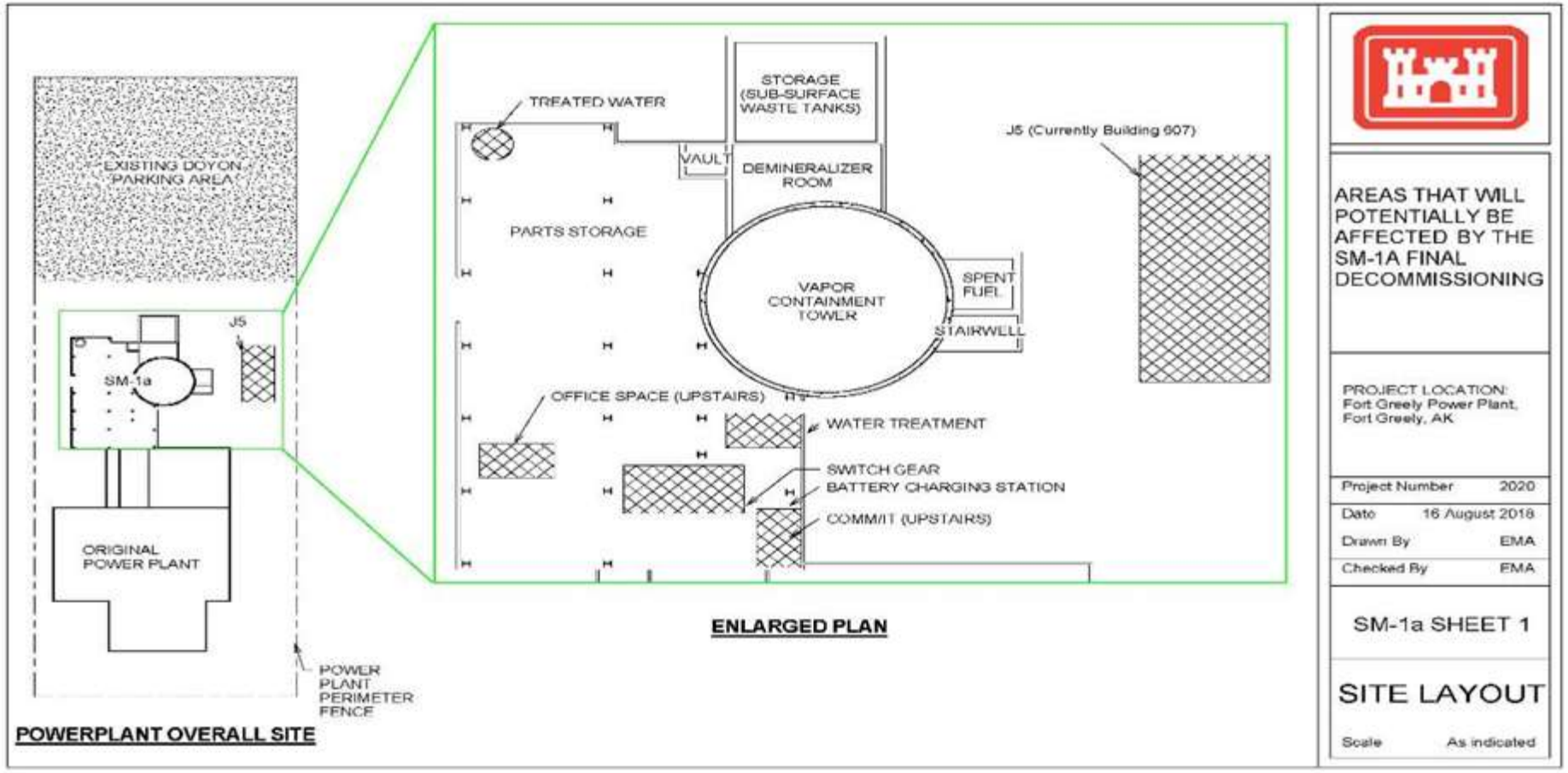
AFFECTED AREAS OF SM-1A – BUILDING 606



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APPLICABLE REGULATIONS FOR SM-1A

- Clean Water Act (33 USC Section 1251 et seq.)
- Resource Conservation and Recovery Act (42 USC Section 6901 et seq.)
- Toxic Substances Control Act (15 USC Section 2601 et seq.)
- Section 438 of the Energy Independence and Security Act (Public Law 110-140)
- Federal Clean Air Act of 1990 (42 USC Section 7401 et seq., as amended)
- Endangered Species Act [ESA] (16 USC Section 1531 et seq.)
- Migratory Bird Treaty Act (16 USC Section 703 et seq.)
- National Historic Preservation Act (NHPA) (54 USC Section 300101 et seq.)
- Archaeological Resources Protection Act (ARPA) 16 USC 470
- Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC Section 3001 et seq.)
- 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)
- Applicable State and Local regulations

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NATIONAL ENVIRONMENTAL POLICY ACT PROCESS

- The National Environmental Policy Act (NEPA) requires federal agencies to assess the environmental and socioeconomic effects of their proposed actions prior to making decisions.
- NEPA also provides opportunities for the public to learn about and comment on federal proposed actions.

NEPA – ENVIRONMENTAL ASSESSMENT

- USACE is preparing an Environmental Assessment (EA) to analyze the potential impacts from the proposed decommissioning (the "Proposed Action").
- An EA is a concise public document that provides 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.

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EA – INTENT AND DECISION

- The EA will inform decision-makers and the public of the Proposed Action's potential environmental effects and its considered alternatives prior to making a federal decision to implement an alternative.
- This decision-making process also includes identifying measures that USACE would commit to undertake to minimize potential environmental effects, as required by NEPA, Council on Environmental Quality (CEQ) regulations, and Army NEPA regulations.
- The decision to be made is whether USACE should implement the Proposed Action and, if necessary, incorporate measures to minimize potential adverse effects and enhance beneficial effects on resources, as applicable.

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EA – 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 at 10 CFR 20.1402 and adopted by the Army; and terminate the US Army Nuclear and Countering Weapons of Mass Destruction Agency (USANCA)-issued SM-1A decommissioning permit.

The **need** for the Proposed Action is to complete the 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 ARO in AR 50-7.

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EA – ALTERNATIVES

- No Action Alternative
  - Under the No Action Alternative, USACE would continue to maintain SM-1A in SAFSTOR condition under its current Reactor Possession Permit (SM1A-1-19). This Alternative would not meet the Purpose and Need, and is included to provide a comparative baseline in accordance with 40 CFR Part 1502.14.
- Proposed Action Alternative
  - The Proposed Action Alternative would implement the Proposed Action to meet the Purpose and Need.
- Dismissed Alternatives
  - Alternatives initially considered by USACE that did not meet one or more of the screening criteria will be briefly described and dismissed from detailed evaluation in the EA.

EA – EFFECTS ANALYSIS

EA evaluation of environmental and related social and economic effects may include the following resource areas:

- Radiological and Occupational Safety and Health
- Socioeconomics and Environmental Justice
- Utilities
- Transportation and Traffic
- Non-Radiological Hazardous Materials and Non-Hazardous Solid Waste
- Cultural Resources
- Geology, Topography, and Soils
- Water Resources
- Biological Resources
- Air Quality

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EA – PUBLIC INVOLVEMENT

USACE outreach regarding the proposed decommissioning of SM-1A is ongoing:

- Scoping letters were sent to stakeholders and Alaska Native tribes to solicit feedback to be considered in the EA.
- Will include a minimum 30-day public review and comment period for the Draft EA, as well as a public meetings at multiple locations (or virtual, depending on situation at the time).
- Publication of Draft EA will be announced via a Notice of Availability in local and on-post newspapers; printed copies will also be available.
- All substantive comments received during the Draft EA public review period will be addressed in the Final EA.

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EA – AGENCY INVOLVEMENT

- USACE will consult with multiple regulatory agencies regarding the Proposed Action, including:
  - Alaska Department of Natural Resources
  - Alaska Office of History and Archaeology
  - State Historic Preservation Office
  - U.S. Fish and Wildlife Service
  - US EPA
- USACE is consulting with federally recognized Alaska Native tribes in accordance with DOD Instruction 4710.02, *Interactions with Federally Recognized Tribes.*
- Substantive public and agency comments received during the NEPA process will be addressed in the Final EA, as appropriate.

NATIONAL HISTORIC PRESERVATION ACT

- Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider effects of undertakings on resources listed in or eligible for inclusion in the National Register of Historic Places (NRHP).
- Key components of Section 106 requirements include:
  - **Consult** with federal agencies, State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officers, Advisory Council on Historic Preservation, and other consulting parties
  - **Identify** historic properties and determine eligibility for the NRHP
  - **Assess effects** to eligible historic properties in consultation with interested parties and determine if effects are adverse
  - **Resolve adverse effects** by avoiding, minimizing, or mitigating impacts

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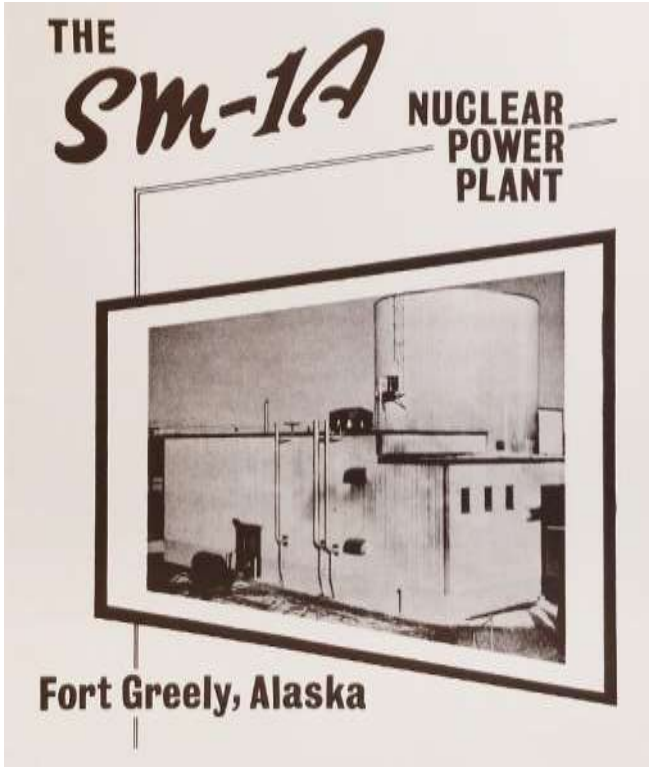
SECTION 106 CONSULTATION

- USACE is the Lead Federal Agency
- USAG Alaska Involvement
- USACE Consultation with SHPO/OHA
  - Area of Potential Effect (June 2020)
  - Technical Project Planning (TPP) Involvement
  - Cultural Resources Technical Report (expected Summer 2020)
  - Mitigation for any adverse effects (expected Memorandum of Agreement)
- USACE NEPA/Section 106 consultation letters to tribal governments



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CULTURAL RESOURCES TECHNICAL REPORT

- Update eligibility of SM-1A Reactor Facility (eligible for the NRHP).
- Assess project effects to historic properties, including SM-1A Reactor Facility and Fort Greely Historic District.
- Archaeology – low probability for archaeological resources due to previous ground disturbance.
- Project will follow Fort Greely's existing Integrated Cultural Resources Management Plan which includes protocols for unanticipated discoveries.
- Discuss mitigation options with SHPO.

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SM-1A DECOMMISSIONING PLANNING SCOPE

- Review of historical documents associated with the All Hazards Analysis
- Prepare planning documents that will support the Army Reactor Office issuing the USACE a decommissioning permit for the SM-1A reactor
- Comply with other relevant Federal and State requirements that will support the long-term decommissioning planning
- Ensure adherence of project activities to NRC regulations
- Coordinate with appropriate federal, state, and public entities to support issuance of decommissioning permit and other NEPA requirements

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SM-1A KEY DELIVERABLES

- Disposal Plan, Schedule and Cost Estimate
- Decommissioning Plan
- Waste Management and Disposal Plan
- Environmental Assessment
- Section 106 Effects Assessment and agreement document

PROPOSED ACTION – PRELIMINARY ACTIVITIES

Installation of replacement *or* relocation of existing co-located Doyon utility systems from Building 606 North to Building 606 South:

- Replacement equipment will be installed (e.g. electrical switchgear, water softener system, communications, etc.) and eventually switched over from existing systems.
- A wall will be built inside the plant to separate the North and South parts of the building.

Temporary relocation of Doyon operations and storage from Building 606 North and Building J-5 to temporary office and storage space:

- Proposed relocation includes temporary installation of a two story modular storage and office space on the southwest corner of the building.
- Construction of a permanent building addition on the southeast corner of the building to provide storage space and an electrician's office and work space (requires some minimal demolition).

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PROPOSED RELOCATION OF DOYON FACILITIES

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PROPOSED ACTION – PRELIMINARY ACTIVITIES (CONT.)

Receive Decommissioning Permit from Army regulator. Specific plans will implement the following:

- Implementation of ALARA in all work processes to include contamination control
- Tracking and reporting of waste
- Development of decommissioning documents to include: Quality Assurance Project Plan, Transportation and Disposal, Radiation Safety Plan
- Personnel monitoring for radiation exposure

Preparation of laydown and containerized waste storage area(s) – adjacent and nearby locations:

- Locations will be selected with the concurrence of Fort Greely
- Waste storage areas will be designed to ensure protection of materials while in storage.
- Laydown storage areas will be either concrete or gravel and will be located in the general vicinity of the project so as to not impede adjacent tenants' daily work activities

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PROPOSED ACTION – PRIMARY ACTIVITIES

Hazardous materials abatement (asbestos, lead-based paint (LBP), etc.):

- Lead is found in various capacities at the site. Sheet lead used for shielding is known to be located in the spent fuel pool, the vapor container (VC) and the waste tank room.
- Disposal of lead sheeting could be via any of the following processes:
  - If it can be easily cleaned, it will be decontaminated and released for recycle.
  - Macroencapsulation and disposal at a RCRA waste facility.
  - Small amounts can be utilized for shielding in packages for disposal.
- LBP is prevalent throughout Bldg. 606 and 675. No LBP was identified in J-5.

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PROPOSED ACTION – PRIMARY ACTIVITIES (CONT.)

Hazardous materials abatement (asbestos, LBP, etc.):

- Asbestos has been found in the following forms and locations and equipment (e.g. inside/on piping insulation):
  - Friable, Category 1 Asbestos-Containing Material (ACM) is present in the Bldg. 606 and Bldg. 675.
    This material must be abated prior to demolition of Bldg. 606
  - These materials are primarily thermal system insulation, including – cementitious, white pipe and boiler insulation, stack insulations, and turbine insulation.
  - Non-friable, Category 1 ACM is present in the Bldg. 606, J-5, and Bldg. 675.
- PCBs have not been detected in large quantities in previous surveys.
- However it is anticipated that PCBs may be present inside electrical equipment as an oil or in the paint throughout the building.

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PROPOSED ACTION – PRIMARY ACTIVITIES (CONT.)

Removal of the Spent Fuel Pit (approx. 150 CY of waste):

- Spent fuel, absorber elements, and other highly-radioactive items were removed in 1973.
- Contaminated pumps, motors, and other miscellaneous equipment were placed in the spent fuel pit; the pit was filled with a sand/grout mixture and capped with 36 inches of concrete.

Removal of waste sealed in Demineralizer Room (approx. 100 CY or waste):

- Approximately 75% of the room is filled with removed piping (some with asbestos insulation), glassware, miscellaneous tools, old personal protective equipment, and soil from previous remediation activities.
- Last accessed in 2011.

Removal of waste from the Waste Tank Pit (approx. 400 CY waste):

- Waste Tanks Pit contained five liquid radioactive waste storage tanks of 5,000 gallons (1), 7,500 gallons (2), and 250 gallons (2). (all liquid radioactive waste was previously removed; this is removal of the waste tanks only)
- Contaminated soil from the yard area along with miscellaneous contaminated items - equipment, ¾-inch pipe, and tools that it was not feasible to decontaminate (all currently stored in the former waste tanks encased in a grout/sand mixture)

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PROPOSED ACTION – PRIMARY ACTIVITIES (CONT.)

Demolition of Building J-5

Demolition of Building 606 North

- VC work will require removing the grout, segmenting the concrete walls, removing encased radioactive equipment (including the reactor pressure vessel – the RPV), removing the base concrete, and other general demolition tasks. Risks include, but are not limited to: high radiation levels (RPV removal), airborne grout and silica hazards, and controlling heavy lifts.
  - Encased Areas:
    - VC
    - Spent Fuel Pit
    - Waste Tanks Pit
  - Currently inaccessible areas:
    - Demineralizer Room
    - New Fuel Vault
  - Accessible areas:
    - Doyon-occupied areas

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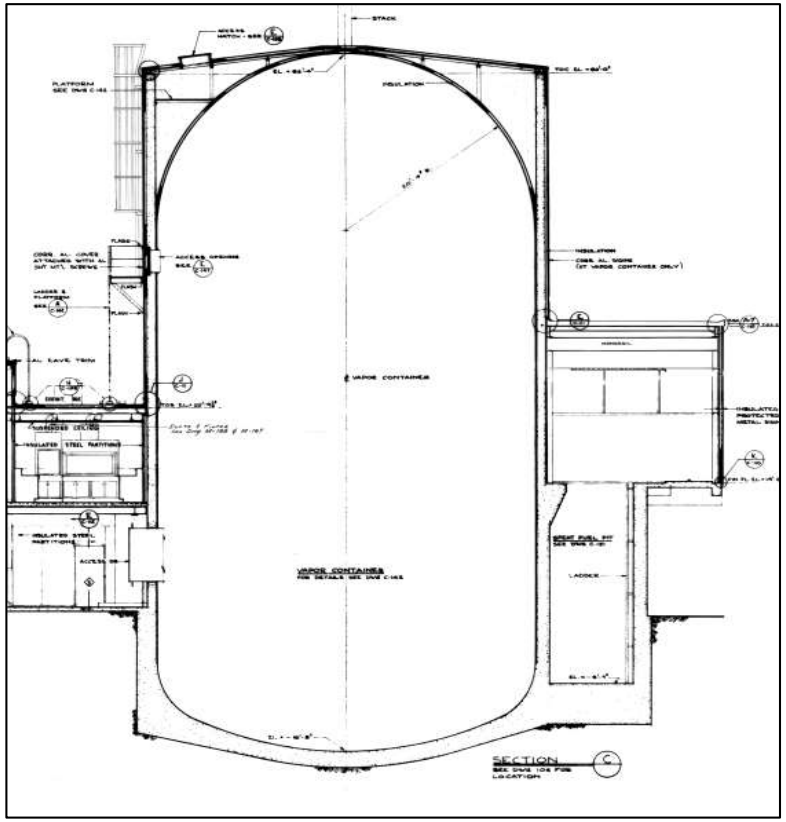
PROPOSED ACTION – PRIMARY ACTIVITIES (CONT.)

Radioactive Contamination Control and Monitoring:

- Use existing structures for waste packaging when available (e.g. sending intact tanks as waste instead of segmenting them)
- Use temporary negative-pressure containment structures for grout/sand removals
- High-efficiency air particulate filtration air control
- Air monitoring at work site and perimeter



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PROPOSED ACTION – ASSOCIATED ACTIVITIES

Determinations of No-Further-Action during decommissioning activities

Ongoing documentation in separate Technical Memoranda

- Release of Jarvis Creek area/island
  - Surveys and sampling conducted in 2011
  - No contamination identified
- Release of Building 670 (former radioactive waste storage area)
  - 58 drums of waste soil from the 1991 Spent Fuel Pit wall improvements project (shipped within 1 year to WA)
  - Surveys conducted in 2019
  - No contamination identified
- Release of Building 675 (former post laundry)
  - Initial survey conducted in 2011
  - Confirmation surveys and additional sampling in 2019
  - No contamination identified

Areas listed above are being considered for release with no further action due to prior cleanup and removal activities. The team has done a considerable amount of radiological characterization work to ensure the areas are free from contamination.

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PROPOSED ACTION – ASSOCIATED ACTIVITIES (CONT.)

- Localized soil remediation inside the site perimeter fence via use of excavators to remove the soil under stringent radiological controls. Controls will include establishment of radiological controlled areas to preclude unauthorized access, air monitoring, radiation surveys of material be excavated, exposure monitoring for workers and nearby tenants.
- Non-radioactive contaminants associated with the reactor facility will also be remediated,
- Localized soil waste is expected to be low level radiological waste (LLRW) for transport to licensed disposal facilities.
- Removal of 40 feet of 1-inch waste water pipeline from the waste tanks pit to the north fence (remnant of 1999 removal action) and any associated impacted soil.

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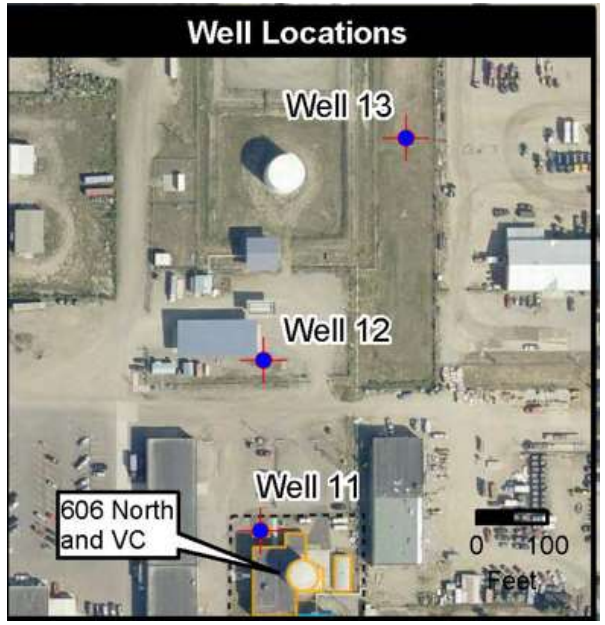
PROPOSED ACTION – ASSOCIATED ACTIVITIES (CONT.)

Abandon 3 wells in place after removing above-grade and below-grade concrete structures; there is limited data on the concrete structures but data suggest that they are not contaminated above release limits; well casings are expected to be free of contamination (if contamination is found during decommissioning activities, additional steps will be taken to address the wells):

- No. 11 – Supply water (inside perimeter fence)
- No. 12 – Supply water (250 north of No. 11; outside fence)
- No. 13 – Dry well/Recovery well (received condenser water and later treated waste water)
- Removal of 500 feet of pipeline from Building 606 North to Well No. 13



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PROPOSED ACTION – FINAL ACTIVITIES

- Ship final radioactive waste
- Routine shipping during construction seasons (late spring through fall)
- Final status surveys: gamma radiation surveys and sampling for all radionuclides of concern in accordance with Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)
  - Surveys and sampling will include surface soil and sidewalls in all open excavations, surface soil in other areas within the facility fence, and other waste staging areas utilized by the project
- 3rd-party verification surveys
- Reporting/Documentation
- Termination of Decommissioning Permit

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WORKER AND PUBLIC SAFETY

Safety is the Army's number one priority - the safety and health of the community, contractors, and staff are paramount to the success of our project

Occupational Safety Measures:

- Trained professionals with oversight from USACE will use proven techniques and precautions to ensure the safety of workers, the installation tenants and community (engineering and administrative controls)
- Workers will wear appropriate PPE for protection against transferable and airborne hazards (radiological and non-radiological) as required throughout the project
- Heavy lifts (up to 80,000 pounds) will be planned and executed by trained and experienced individuals with consideration of potential high winds and surrounding structures
- Excavations may exceed 17 feet below the ground surface which will require proper shoring to protect personnel and adjacent structures

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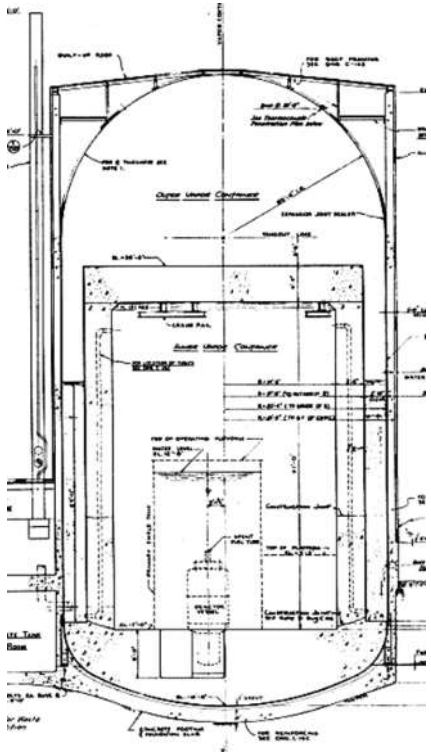
WORKER AND PUBLIC SAFETY (CONT.)

Public Safety Measures:

- Proven techniques and precautions will be implemented by trained professionals to ensure the safety of the public is maintained (with oversight from USACE)
- Asbestos abatement and radiological decontamination and demolition work will be completed within negative pressure containment with High Efficiency Particulate filtration
- All wastes will be properly packaged in compliance with USDOT regulations



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WASTE STORAGE

- Waste removed from SM-1A will be classified as clean construction debris, mixed, and hazardous or radioactive wastes.
- Waste will be loaded into shipping containers at the worksite and moved to the storage location on Fort Greely.
- At the storage location, packaged waste will be placed in designated areas for the waste types; clean construction, hazardous, mixed and radioactive.
- Radiation surveys will be performed at the storage location to ensure the waste doesn't detrimentally impact human health or the environment.

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WASTE STORAGE (CONT.)

- Containerized waste storage areas (adjacent and nearby locations) will be selected with the concurrence of Fort Greely. Waste storage areas will be designed to ensure protection of materials while in storage.
- Laydown storage areas will be either concrete or gravel and located in the general vicinity of the project so as to not impede tenants' daily work activities.
- Larger components (Steam Generator, Reactor Coolant Pump, Pressurizer, RPV) removed from the VC will be placed into specialty containers to accommodate the size and activity of the component.
- All wastes will be managed in accordance with applicable regulations

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DISPOSAL OPTIONS

Free released materials

- Materials such as construction and debris (C&D) waste that have undergone radiation surveys to verify that any residual radioactivity is below the dose-based and regulatory-approved release limit
- Represents no increased risk to members of the public
- Once released, these materials are available for disposal at regional and municipal landfills and for recycling/reuse.

Disposal locations considered include:

- Delta Junction
- Fairbanks North Star Borough landfill
- Fort Greely C&D landfill

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DISPOSAL OPTIONS (CONT.)

LLRW Potential Disposal Sites:

- The US Department of Energy (DOE) has determined that it will accept title to radioactive wastes from the SM-1A reactor decommissioning project at the time of disposal in the Federal Waste Facility (FWF) at Waste Control Specialists (WCS) located near Andrews, Texas.
- Nevada National Security Site (NNSS), Nevada
- DOE Hanford, Washington
- Energy Solutions, Utah (commercial)

- Very low activity material available for alternate disposal – Sites are as follows:
  - US Ecology, Idaho
  - WCS, Texas (RCRA cell)
- RCRA and TSCA waste – Sites will be determined, but some possible options are:
  - Regional landfills in the Pacific northwestern states
  - Thermal treatment at US Ecology/NRC Alaska's Moose Creek facility
  - Fairbanks North Star Borough landfill (asbestos accepted on a scheduled basis)

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WASTE TRANSPORT OPTIONS BEING CONSIDERED

- Clean construction debris (concrete, piping, metal, etc.) may be disposed of at Delta Junction Landfill or onsite at Fort Greely. Clean construction debris may be sized and loaded directly into trucks at the work site and transported to the appropriate facility.
- Hazardous, Mixed and Radioactive wastes will be disposed of at the selected RCRA/TSCA/LLRW/LLMW facilities.
- The team anticipates waste destined for the lower 48 will be transported by truck to the rail yard in Fairbanks, loaded onto rail cars and transported to the Port of Anchorage, the rail cars will be loaded onto barges and shipped to Port of Tacoma and then transported by rail to the selected RCRA/TSCA/LLRW/LLMW facilities (final transportation route will be determined by the joint team of the Gov't and the future decommissioning contractor).

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WASTE TRANSPORT OPTIONS BEING CONSIDERED (CONT.)

- Truck shipments from Fort Greely to Fairbanks Depot, Alaska
  - Twice weekly shipments (average)
  - 6 hour roundtrip drive (filled/empty containers)
- Rail shipments from Fairbanks Depot to Port of Anchorage, Alaska
  - 2 weekly shipments available
  - 1 day duration
- Barge from Anchorage to Tacoma, WA
  - Twice weekly service
  - Departs: Wednesday and Friday
  - Fairbanks to Tacoma 13 day transit one way

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OTHER WASTE TRANSPORT CONSIDERATIONS

- Larger components (Steam Generator, Pressurizer, PRV) will each be packaged shipped intact as a handful of oversize loads over the course of work and may require highway restrictions and possibly escort vehicles.
- Heavy loads are restricted on Alaskan roadways during the spring months to avoid damage to the roadways.
- The RPV will be the highest classified and heaviest single waste shipment. Due to the amount of radioactivity in the RPV, the shipment will be a Category 2 shipment in accordance with 10 CFR 37. This requires special security precautions that must be implemented during the shipment.
- Examples of security include tracking, route review and approval, and notification of local authorities over the shipment route.
- Each oversize load will be evaluated during the planning phases to ensure that potential transport issues such as escort vehicles, roadway stipulations, rail and barge schedules are coordinated.

USACE RESOURCES AND FEDERAL OVERSIGHT

Members of the project and oversight team include:

- Professional Engineers
- Certified Health Physicists (Radiation Safety)
- Certified Industrial Hygienists
- Environmental Scientists
- Regulatory Specialists
- Safety Specialists
- Qualified Technicians

- U.S. Army Corps of Engineers will provide quality assurance over the contractor and their quality control program
- Corps of Engineers National Environmental Center of Expertise
- Army Reactor Office and Reactor Council
- Oak Ridge Associated Universities – Independent Review

QUESTIONS AND HOW TO LEARN MORE

Learn more about the SM-1A Project online at:
https://www.nab.usace.army.mil/SM-1A/

Sign up for the SM-1A stakeholder update e-mail list by e-mailing:
CENAB-CC@usace.army.mil

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Pre-decisional information