Action Memorandum for Decommissioning CPP-601/640 Fuel Reprocessing Facilities

August 2008
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Prepared for the
U.S. Department of Energy
DOE Idaho Operations Office
Signature sheet for the *Action Memorandum for Decommissioning CPP-601/640 Fuel Reprocessing Facilities* at the U.S. Department of Energy's Idaho National Laboratory. This action is conducted by the U.S. Department of Energy with the concurrence of the U.S. Environmental Protection Agency and the Idaho Department of Environmental Quality.

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Deputy Manager  
U.S. Department of Energy Idaho Operations Office

Date: 7/10/08
Signature sheet for the *Action Memorandum for Decommissioning CPP-601/640 Fuel Reprocessing Facilities* at the U.S. Department of Energy’s Idaho National Laboratory. This action is conducted by the U.S. Department of Energy with the concurrence of the U.S. Environmental Protection Agency and the Idaho Department of Environmental Quality.

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Signature sheet for the *Action Memorandum for Decommissioning CPP-601/640 Fuel Reprocessing Facilities* at the U.S. Department of Energy’s Idaho National Laboratory. This action is conducted by the U.S. Department of Energy with the concurrence of the U.S. Environmental Protection Agency and the Idaho Department of Environmental Quality.

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ABSTRACT

This Action Memorandum presents the selected alternative for decommissioning of the CPP-601/640 Fuel Reprocessing Facilities at the U.S. Department of Energy’s (DOE’s) Idaho National Laboratory under the Idaho Cleanup Project. Because the missions of the Fuel Reprocessing Facilities at the Idaho Nuclear Technology and Engineering Center (INTEC) have been completed, an engineering evaluation/cost analysis that evaluated alternatives to accomplish the decommissioning of the Fuel Reprocessing Facilities was prepared and released for public comment. The scope of this Action Memorandum is the decommissioning and final end state of the CPP-601/640 Fuel Reprocessing Facilities. The selected non-time-critical removal action (NTCRA) is Alternative 2 with minor revisions incorporated as a result of the public comment process. The selected NTCRA includes removing and disposing of the building components above the process cells. The minor revision leaves the top 8 ft of the P, Q, and R cells intact as well as the bottom 2.5 ft of the Mechanical Handling Cave (MHC). This change reduces short-term worker risk without significant impact to long-term protection of human health or the environment. Process cells and other void areas below this level will be filled with concrete or other inert material encapsulating the remaining vessels and piping within the buildings and thereby creating a concrete monolith generally 11 ft above grade. The P, Q, and R cells will extend 8 ft higher and the remains of the MHC will extend 2.5 ft above the general structure. Control of precipitation runoff will be integrated with the Operable Unit 3-14 Recharge Control Zone to the extent practical, diverting the collected precipitation through lined ditches to evaporation ponds. Upon completion of DOE’s operational activities at INTEC, an earthen cover will be placed over the concrete monolith integrated with the surrounding facilities.
EXECUTIVE SUMMARY

This Action Memorandum presents the selected alternative for decommissioning the CPP-601/640 Fuel Reprocessing Facilities at the Idaho National Laboratory Site under the Idaho Cleanup Project. This Action Memorandum has been prepared in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the “Superfund Amendments and Reauthorization Act of 1986” (Public Law 99-499), and in accordance with the “National Oil and Hazardous Substances Pollution Contingency Plan” (40 CFR 300). This action is consistent with the joint U.S. Department of Energy (DOE) and Environmental Protection Agency Policy on Decommissioning of Department of Energy Facilities Under the Comprehensive Environmental Response, Compensation, and Liability Act (DOE and EPA 1995), which establishes the CERCLA non-time-critical removal action process as an approach for decommissioning. This approach satisfies environmental review requirements and provides for stakeholder involvement, while providing a framework for selecting the decommissioning alternative. An Administrative Record has been established to record information used to support the selected alternative, as well as provide documentation of decisions and the progress of the removal action.

An engineering evaluation/cost analysis (EE/CA) that evaluated alternatives to accomplish the decommissioning of the CPP-601/640 Fuel Reprocessing Facilities was prepared and released for public comment (DOE-ID 2008). Comments received during the public comment period are included in Appendix A.

The scope of the EE/CA was the decommissioning and final end state of the CPP-601/640 Fuel Reprocessing Facilities. The EE/CA evaluated three alternatives for achieving the end state. Alternative 2, “Demolition to Process Makeup/Hot Makeup Decks,” was the recommended alternative and ultimately was selected after agency and public reviews. This alternative meets the remedial action objectives (RAOs) regarding long-term risk, minimizes short-term worker risk and radiation exposure, meets the DOE goal of reducing the risk and long-term surveillance and maintenance costs on legacy buildings and structures, is cost effective, and provides a safe and stable configuration that is environmentally sound.

The selected alternative removes building and components down to the PM/HM Deck, with the exception of the top of the P, Q, and R cells and bottom of the Mechanical Handling Cave (MHC). The P, Q, and R cells will extend 8 ft above the PM Deck and the MHC will extend approximately 2.5 ft above the HM Deck. This will leave a concrete monolith approximately 11 ft above grade with the two minor exceptions noted above. This leaves the process cells intact. After the removal process, this alternative fills large void spaces without significant piping or vessels with grout or other inert material. The remaining void spaces within the building will be filled with flowable grout to minimize void spaces. The top surface of the monolith will be sloped to facilitate integration of precipitation control with the Operable Unit (OU) 3-14 remedial action to the extent practicable. The collected precipitation will be directed toward lined ditches that will divert the water outside the OU 3-14 Recharge Control Zone. The concrete monolith will require routine maintenance, monitoring, and institutional controls (ICs) to ensure that future risk remains acceptable until such time as the earthen cover is applied.

The selected alternative meets RAOs consistent with the Record of Decision for Tank Farm Soil and INTEC Groundwater, Operable Unit 3-14 (DOE-ID 2007), and also supports the DOE-ID long-term strategy to ensure protection of human health and the environment while achieving an end state for the CPP-601/640 Fuel Reprocessing Facilities. This end state balances long-term risk, short-term worker risk and radiation exposure, and cost, while providing a safe and stable configuration with the fewest post-closure activities. This alternative also eliminates unnecessary infrastructure and overhead costs and minimizes long-term surveillance and maintenance costs.
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<tr>
<td>ALARA</td>
<td>as low as reasonably achievable</td>
</tr>
<tr>
<td>ARAR</td>
<td>applicable or relevant and appropriate requirement</td>
</tr>
<tr>
<td>CERCLA</td>
<td>Comprehensive Environmental Response, Compensation, and Liability Act</td>
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<tr>
<td>CFA</td>
<td>Central Facilities Area</td>
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<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>CPP</td>
<td>Chemical Processing Plant (now INTEC)</td>
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<tr>
<td>D&amp;D</td>
<td>decontamination and decommissioning</td>
</tr>
<tr>
<td>DEQ</td>
<td>(Idaho) Department of Environmental Quality</td>
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<td>DOE</td>
<td>U.S. Department of Energy</td>
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<td>EE/CA</td>
<td>engineering evaluation/cost analysis</td>
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<td>EPA</td>
<td>Environmental Protection Agency</td>
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<tr>
<td>HM</td>
<td>Hot Makeup</td>
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<tr>
<td>HWMA</td>
<td>Hazardous Waste Management Act</td>
</tr>
<tr>
<td>IC</td>
<td>institutional control</td>
</tr>
<tr>
<td>ICDF</td>
<td>Idaho CERCLA Disposal Facility</td>
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<td>IDAPA</td>
<td>Idaho Administrative Procedures Act</td>
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<td>INL</td>
<td>Idaho National Laboratory</td>
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<tr>
<td>INTEC</td>
<td>Idaho Nuclear Technology and Engineering Center</td>
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<tr>
<td>IDW</td>
<td>Investigation Derived Waste</td>
</tr>
<tr>
<td>MCL</td>
<td>maximum contaminant level</td>
</tr>
<tr>
<td>MHC</td>
<td>Mechanical Handling Cave</td>
</tr>
<tr>
<td>NTCRA</td>
<td>non-time-critical removal action</td>
</tr>
<tr>
<td>OU</td>
<td>operable unit</td>
</tr>
<tr>
<td>PCB</td>
<td>polychlorinated biphenyl</td>
</tr>
<tr>
<td>PEW</td>
<td>Process Equipment Waste (Evaporator)</td>
</tr>
<tr>
<td>PM</td>
<td>Process Makeup</td>
</tr>
<tr>
<td>RAO</td>
<td>remedial action objective</td>
</tr>
<tr>
<td>RCRA</td>
<td>Resource Conservation and Recovery Act</td>
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RG  remediation goal
ROD  Record of Decision
S&M  surveillance and maintenance
SHPO  State Historic Preservation Officer
SRPA  Snake River Plain Aquifer
TFF  Tank Farm Facility
TSCA  Toxic Substances Control Act
USC  United States Code
VCO  Voluntary Consent Order
WAC  Waste Acceptance Criteria
Action Memorandum for Decommissioning
CPP-601/640 Fuel Reprocessing Facilities

1. PURPOSE

The purpose of this Action Memorandum is to describe the selection of the alternative for the non-time-critical removal action (NTCRA) for the CPP-601/640 Fuel Reprocessing Facilities at the Idaho Nuclear Technology and Engineering Center (INTEC) within the Idaho National Laboratory (INL) Site. Those facilities are shown in Figure 1-1.

Figure 1-1. CPP-601/640 Fuel Reprocessing Facilities.

2. SITE CONDITIONS AND BACKGROUND

This section summarizes background information and describes the CPP-601/640 Fuel Reprocessing Facilities. It identifies previous and ongoing closure and cleanup activities, and describes the building and structures addressed in this Action Memorandum and additional information relevant to the scope of this document. This section also summarizes the radiological and nonradiological characterization of the CPP-601/640 Fuel Reprocessing Facilities.

2.1 Site Description

The INL Site, managed by the U.S. Department of Energy (DOE), is located 51 km (32 mi) west of Idaho Falls, Idaho, and occupies 2,305 km² (890 mi²) of the northeastern portion of the Eastern Snake River Plain. In 1949, the U.S. Atomic Energy Commission established the INL Site, which was called the National Reactor Testing Station at that time, to conduct nuclear energy research and related
activities. It was designated the Idaho National Engineering Laboratory in 1974 and then the Idaho National Engineering and Environmental Laboratory in 1997. In 2005, to better focus the laboratory’s missions, DOE established the Idaho Cleanup Project to bring the environmental management mission to completion and redesignated the laboratory as the INL to better reflect the new research directions.

DOE’s Idaho Operations Office (DOE-ID) controls all land within the INL Site. Public access is restricted to public highways, sponsored tours, special-use permits, and the Experimental Breeder Reactor I National Historic Landmark. In addition, DOE-ID is cognizant of the Shoshone-Bannock tribal members’ need for access to areas on the INL Site for cultural and religious purposes.

2.1.1 Idaho National Laboratory Site and Idaho Cleanup Project

The INL Site is located primarily in Butte County; however, it also occupies portions of Bingham, Bonneville, Clark, and Jefferson counties. The 2000 census indicated the following populations for cities in the region: Idaho Falls–50,730; Pocatello–51,466; Blackfoot–10,419; Arco–1,026; and Atomic City–25. Approximately 2% of the INL Site has been developed to support facility and program operations. Up to 340,000 acres of the INL Site are leased for cattle and sheep grazing administered by the Bureau of Land Management. In 1999, the Secretary of Energy designated 73,263 acres on the INL Site as the Sagebrush Steppe Ecosystem Reserve to ensure this portion of the ecosystem received special scientifically controlled consideration.

Surface water flows on the INL Site consist mainly of three streams draining intermountain valleys to the north and northwest of the Site: (1) the Big Lost River, (2) the Little Lost River, and (3) Birch Creek. All of the channels terminate on the INL Site. Flows from Birch Creek and the Little Lost River seldom reach the INL Site because of irrigation withdrawals upstream. The Big Lost River and Birch Creek may flow onto the INL Site before the irrigation season or during high-water years, but the terminal reaches are usually dry. In those few wetter years when the Big Lost River carries water to the end of its channel, the water sinks into the ground.

The physical characteristics, climate, flora and fauna, demography, and cultural resources of the INL Site and INTEC area are further described in the Final Record of Decision Idaho Nuclear Technology and Engineering Center Operable Unit 3-13 (DOE-ID 1999) and Record of Decision for Tank Farm Soil and Idaho Nuclear Technology and Engineering Center Groundwater, Operable Unit 3-14 (DOE-ID 2007a).

2.1.2 Idaho Nuclear Technology and Engineering Center

The INTEC began operations in 1952. The primary missions at INTEC were reprocessing uranium for defense purposes and research and storage of spent nuclear fuel. Irradiated defense nuclear fuels were reprocessed to recover unused uranium. In 1992, the reprocessing mission was phased out. The locations of the CPP-601/640 Reprocessing Facilities are shown in Figure 2-1.

2.1.3 CPP-601 Description

The CPP-601 facility was built in 1953. It contains chemical processing equipment used to recover uranium from various types of nuclear fuel. Nuclear fuel reprocessing at CPP-601 was terminated in 1992. Flushing of the process vessels and piping has been completed to remove uranium from the facility to the maximum extent practical. The facility is essentially rectangular (244 × 102 ft), and consists of six levels (mostly below ground). See Figure 2-2 for an isometric view of CPP-601.
Figure 2-1. CPP-601/640 Fuel Reprocessing Facilities location at INTEC.
2.1.3.1 CPP-601 Process Makeup Area. The process makeup (PM) area, beginning at 10.5 ft above grade, is the uppermost level of CPP-601. The PM area was used to transfer chemicals and fuel elements to the process equipment in the cells below. It contained chemical makeup and storage systems that included tanks, pumps, filters, agitators, related instrumentation, and miscellaneous support equipment. The floor of the PM area (generally about 4 ft thick) provided shielding from the highly radioactive processes taking place in the process cells below. Three of the 25 process cells in CPP-601 (P, Q, and R) extend approximately 8 ft above the floor of the PM area.
2.1.3.2 **CPP-601 Processing Areas.** The primary mission of CPP-601 was the dissolution of spent fuel and subsequent uranium solvent extraction that occurred within the process cells. The uranium recovered from the solvent extraction process was shipped off-site for further processing. The primary waste was high-level waste, which was piped to the Tank Farm Facility (TFF) for storage before further processing. Liquid wastes such as decontamination solutions generated to allow hands-on maintenance of equipment were collected in four 5,000-gal tanks located in two tank vaults approximately 57 ft below grade before being transferred for later treatment in the Process Equipment Waste (PEW) Evaporator located in CPP-604. These tanks were also used to collect waste from nearby facilities including CPP-602, CPP-666, and CPP-684. These four tanks, along with ancillary lines, will be closed under a Hazardous Waste Management Act/Resource Conservation and Recovery Act (HWMA/RCRA) closure plan, which is outside the scope of this proposed NTCRA.

The lower levels contain 25 process cells. The floor and part of the walls of each cell are lined with stainless steel and most of the equipment is stainless steel. The majority of the processing equipment in the building is located in the heavily shielded cells and was designed for remote operation. However, the facility was not designed to support remote maintenance, but instead required hands-on involvement. This hands-on involvement required significant decontamination effort between operations cycles to reduce exposure levels to allow people access to the equipment. The two rows of process cells are separated by the operating corridor, service corridor, access corridor, and waste trench. Sampling and cell ventilation corridors are located outside the rows of cells.

2.1.4 **CPP-640 Description**

The CPP-640 Headend Processing Plant facility conducted only fuel dissolution processes. The aqueous product solution was then sent to CPP-601 for uranium extraction. The processing of fuel in CPP-640 ended in June 1984.

CPP-640 is a five-level, rectangular, 66 × 89-ft structure that is located west of and next to CPP-601. CPP-640, formerly designated the Hot Pilot Plant, contains five heavily shielded cells and a Mechanical Handling Cave (MHC), which extends approximately 8 ft above the Hot Makeup (HM) deck floor. See Figure 2-3 for an isometric view of CPP-640.

2.1.4.1 **Hot Makeup Area.** The HM area of CPP-640 was formerly used for mixing process chemicals, decontamination solutions, or other chemical solutions used in the CPP-640 process cells. The MHC is located on the HM level of CPP-640. The MHC housed the charging chute for the fuel rods that were processed in the cells below. The MHC walls are 3 ft 6 in. thick and the ceiling is 1 ft thick.

2.1.4.2 **Processing Areas.** The five process cells in CPP-640 are located in the center of the CPP-640 building. Mechanical equipment, ventilation, sampling, off-gas, and other operational support functions were provided on the three levels surrounding this central processing area. CPP-640 contains five process cells. Cell walls are typically 3 ft 6 in. thick. The cell floors are lined with stainless steel that extends up the walls to a height of 4 ft 6 in.

The product of the fuel dissolution process was shipped to CPP-601 for uranium extraction. Decontamination solutions were collected in three 500-gal tanks in two tank vaults approximately 34 ft below grade. These wastes were transferred to the PEW Evaporator located in CPP-604 for treatment. These tanks and ancillary piping are being closed under a HWMA/RCRA closure plan, which is outside the scope of this proposed NTCRA.
Figure 2-3. Isometric view of building CPP-640.
2.2 Background

Development of the Engineering Evaluation/Cost Analysis for Decommissioning of the CPP-601/640 Fuel Reprocessing Facilities (EE/CA) (DOE-ID 2008) and this Action Memorandum has been performed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 United States Code [USC] § 9601 et seq.), as amended by the “Superfund Amendments and Reauthorization Act of 1986” (Public Law 99-499), and in accordance with the “National Oil and Hazardous Substances Pollution Contingency Plan” (40 Code of Federal Regulations [CFR] 300). The decommissioning of the CPP-601/640 Fuel Reprocessing Facilities was not specifically addressed in the in the Final Record of Decision Idaho Nuclear Technology and Engineering Center Operable Unit 3-13 (DOE-ID 1999) or Record of Decision for Tank Farm Soil and Idaho Nuclear Technology and Engineering Center Groundwater, Operable Unit 3-14 (DOE-ID 2007a). This removal action is consistent with the remedial action objectives (RAOs) of the Operable Unit (OU) 3-14 Record of Decision (ROD), and supports the overall remediation goals established through the Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory (DOE-ID 1991) process for Waste Area Group 3. Waste Area Group 3 is located at INTEC, within the INL Site. The removal action will place the facility in a final configuration that remains protective of human health and the environment. Preparation of this Action Memorandum is consistent with the joint DOE and U.S. Environmental Protection Agency (EPA) Policy on Decommissioning of Department of Energy Facilities Under the Comprehensive Environmental Response, Compensation, and Liability Act (DOE and EPA 1995), which establishes the CERCLA NTCRA process as an approach for decommissioning.

The scope of this Action Memorandum is the decommissioning and final end state of the CPP-601/640 Fuel Reprocessing Facilities. Deactivation activities are proceeding in accordance with the Action Memorandum for General Decommissioning Activities under the Idaho Cleanup Project (DOE-ID 2006) in advance of this NTCRA Action Memorandum, and are not included in the scope of the NTCRA. These initial activities involve removal of some piping and equipment; routine waste management practices such as removal of lead, polychlorinated biphenyls (PCBs), and asbestos; closure of HWMA/RCRA tank systems; and activities supporting the completion of Voluntary Consent Order (VCO) activities with these facilities. It is important to understand that a substantial amount of work will have been completed before the finalization of this Action Memorandum.

The purpose of the NTCRA process is to determine

- The final end state of the CPP-601/640 Fuel Reprocessing Facility
- The risks to human health and the environment associated with leaving contamination at the CPP-601/640 Fuel Reprocessing Facility.

Performance of this removal action will place the facility in a configuration that is protective of human health and the environment. Without decommissioning the CPP-601/640 Fuel Reprocessing Facilities, a potential threat of release of hazardous substances exists and, without action, adverse threats to human health and the environment eventually could occur. As the lead agency, DOE has determined that a removal action is an appropriate means to accomplish the final end state and achieve environmental review requirements. Both the Idaho Department of Environmental Quality (DEQ) and the EPA concur that a NTCRA is warranted to place these facilities in a configuration that is protective of human health and the environment.
2.3 Other Actions to Date

Closure/cleanup activities have taken place and will continue at INTEC and CPP-601/640 Fuel Reprocessing Facilities under numerous programs and regulatory authorities. The following sections briefly describe those activities.

2.3.1 Comprehensive Environmental Response, Compensation, and Liability Act Activities at the INTEC

CERCLA remedial actions adjacent to CPP-601/640 have occurred, or will occur, in accordance with the RODs for OU 3-13 and OU 3-14 (DOE-ID 1999 and DOE-ID 2007a). The primary CERCLA remedial action that will interface with the CPP-601/640 buildings is the Tank Farm Soil and INTEC Groundwater Remedial Action (OU 3-14). The industrial use area established by the OU 3-14 ROD encompasses the CPP-601/640 buildings. Coordination with the OU 3-14 remedial actions will be required to minimize the precipitation infiltration within the recharge control zone (immediately east of CPP-601) that is located within the industrial use area. The industrial use area and recharge control zone are shown in Figure 2-4.

Seven release points have been identified beneath CPP-601. The releases were mainly acidic liquids primarily contaminated with radionuclides and metals from the dissolution of spent fuel. No release sites have been identified below CPP-640. The OU 3-13 ROD (DOE-ID 1999) initially determined that release point CPP-80 would be addressed as part of the Group 2 soils. The OU 3-14 ROD (DOE-ID 2007a) added newly identified releases beneath CPP-601 (CPP-118, -119, -120, -121, -122, and -123) to the OU 3-13 Group 2 sites. The OU 3-14 ROD states that the release sites beneath CPP-601 will be addressed under OU 3-13 in accordance with the process identified in the Operable Unit 3-13 Group 2 Closure Evaluation Criteria and Checklist (DOE-ID 2000), using the OU 3-14 remediation goals (RGs) for soil in the industrial use area.

The source terms evaluated in the EE/CA include the releases beneath CPP-601. Compliance with these RGs as well as the RAOs established in this NTCRA (based upon the OU 3-14 ROD) is demonstrated in the CPP-601/640 risk assessment. This is consistent with the remedy selected for the OU 3-13 Group 2 soils approach for releases beneath buildings (i.e., preventing radiation exposure and limiting contaminant migration to the Snake River Plain Aquifer [SRPA]) by placing the buildings above these release points in a stable condition, which will provide the infiltration protection necessary. This NTCRA has been determined to meet the substantive requirements of the process identified in the Closure Evaluation Criteria and Checklist (DOE-ID 2000).

If any newly identified release sites are discovered during implementation of this NTCRA, DOE-ID will consult with DEQ and EPA regarding remediation; if the extent of contamination is beyond the boundaries addressed under this NTCRA, the site(s) will be addressed under the Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory (DOE-ID 1991).
Figure 2-4. Industrial use area and recharge control zone established by OU 3-14 ROD.
2.3.2 Voluntary Consent Order Activities

The VCO actions are being implemented to ensure compliance with HWMA/RCRA (42 USC § 6901) regulations. The VCO is a consent order between DOE-ID and DEQ to address HWMA/RCRA waste issues. VCO actions completed at CPP-601 include system identification and characterization of inactive process/product units located within CPP-601. The VCO units were characterized (including ancillary equipment) as empty, hazardous, or nonhazardous. During the characterization process, the VCO identified 22 units from which raffinate or decontamination/flushing solutions were transferred to TFF. Although the 22 units were verified as empty process units, the piping, valves, and pumps used to collect or transfer solutions to the TFF from these 22 units managed hazardous waste and require further VCO actions. Remaining VCO actions are flushing and closure of the raffinate lines from CPP-601 to the TFF, from G-Cell to U-Cell, and from H-Cell to U-Cell, and flushing and closure of the transfer line from Fluorinel Dissolution Process to CPP-601. The VCO actions will be completed under a HWMA/RCRA closure plan and are outside the scope of this NTCRA.

2.3.3 HWMA/RCRA Coordination

The activities described in this section on HWMA/RCRA coordination will be conducted outside the scope of, but in coordination with, the NTCRA for CPP-601/640.

Four tanks in CPP-601 are included in the Final Partial Permit (Volume 14) on the INL RCRA Part B permit. This tank system includes: VES-WG-100, VES-WG-101, VES-WH-100, and VES-WH-101 along with ancillary piping. A revision to the closure plan for the CPP-601 tank system is being prepared and will be submitted in a permit modification request to Volume 14. Those activities necessary to support the closure of this tank system under HWMA/RCRA authority will be coordinated with the decontamination and decommissioning activities necessary to meet the requirements of the proposed NTCRA. Preclosure activities are under way to isolate these tanks from ongoing operations in surrounding facilities that have historically transferred their waste to these tanks. In addition, flushing of lines to these tanks has been initiated.

Three tanks in CPP-640 are interim status tanks in the INL Part A permit application. This tank system includes VES-HW-100, VES-HW-101, and VES-HW-102 along with ancillary piping. No active systems are transferring waste to these tanks. The closure plan for the CPP-640 tank system has been approved and is being implemented, and the project is nearing completion of HWMA/RCRA closure activities.

The closure of these tank systems will be conducted in accordance with their respective approved HWMA/RCRA closure plans, and will be conducted outside the scope of, but in coordination with, this NTCRA. Closure of these tank systems must be complete before conducting irreversible activities for this NTCRA that would preclude completion of HWMA/RCRA closure activities.

Other materials that could be classified as hazardous wastes are being removed in accordance with the substantive requirements of HWMA/RCRA, and the wastes generated are currently being disposed of at off-site RCRA-permitted disposal facilities in accordance with the waste acceptance criteria (WAC) of the applicable disposal facility. While the objective of the HWMA/RCRA closure is to meet clean-closure criteria, that is not expected to be practical. As discussed in Section 2.3.4, “Removal of Bulk Lead Solids,” approximately 76.9 tons of bulk lead solids have been identified in areas where it likely will be impractical to remove them due to high levels of radioactive contamination and difficult working conditions. As such, a contingent landfill closure plan and postclosure plan for the facility will be submitted along with the CPP-601 tanks closure plan revision. This permit modification would include documentation addressing landfill closure and design requirements associated with non-normal cap
configuration (Idaho Administrative Procedures Act [IDAPA] 58.01.05.008 [40 CFR 264.310]) and a postclosure plan addressing, for example, groundwater monitoring, inspections, and maintenance (IDAPA 58.01.05.008 [40 CFR 264.118]), as well as other applicable requirements. If HWMA/RCRA clean-closure criteria can be met, then the contingent landfill closure and postclosure plan will not be implemented.

The concrete monolith and subsequent earthen cover will require routine maintenance, monitoring, and institutional controls (ICs) to ensure that future worker risk remains acceptable and the requirements of RCRA closure and postclosure permitting authority are integrated as applicable for CPP-601/640.

2.3.4 Removal of Bulk Lead Solids

Approximately 353 tons of bulk lead solids, primarily used for shielding, have been identified for removal in CPP-601/640. Initial lead removal efforts have begun in accordance with the Action Memorandum for General Decommissioning Activities under the Idaho Cleanup Project (DOE-ID 2006). They will continue under this Action Memorandum. The removed lead is being managed in accordance with the substantive requirements of HWMA/RCRA, and is currently being disposed of at an off-site RCRA-permitted disposal facility, in accordance with the WAC of the applicable disposal facility.

While the intent of this NTCRA is to remove accessible lead, it must be recognized that not all lead will be removed under this NTCRA (e.g., the lead anchors embedded within load-bearing walls that would remain in place under all the alternatives). Additional lead that will not be removed is found in the painted surfaces of the buildings that have had lead-containing paint applied at various times over the 50-year lifetime of the facilities.

At this time, two areas within the CPP-601 building have been identified where removal of bulk lead solids is not expected to be practical—the Service Corridor Shielded Waste Trench (74 tons) and the West Vent Tunnel (2.9 tons). Both of these areas have lead shielding that was installed within the concrete floor to minimize worker exposure to radiation. Inaccessibility, along with worker risk (both from radiological and industrial hazards), are expected to make lead removal in these areas impractical. As work progresses, other areas may be identified where it is impractical to remove lead. If additional areas are identified where there is a significant increase in worker risk to remove due to radiological conditions and industrial hazards and there is a lack of benefit (i.e., no decrease in risk to human health and the environment), the regulatory agencies will be contacted to discuss leaving that lead in place. If the regulatory agencies concur that additional lead would be impractical to remove, then it will be left in place to be encapsulated within the concrete monolith. The EE/CA demonstrated that leaving additional lead in the monolith does not increase the long-term risk via the groundwater pathway.

Radiation levels in the work areas and worker exposures would be expected to rise significantly during the removal of the inaccessible lead. However, additional data is required to confirm this expectation. Therefore, additional investigative actions will be conducted to more accurately assess radiation exposure, worker hazard, and degree of difficulty in removing the lead. Removal of all of the bulk lead items in CPP-601/640 will likely be impractical due to the increase in worker risk and hazard along with the lack of a benefit or decrease in risk to human health and the environment. Therefore, this lead will likely be left in place as a structural component of the building as part of the NTCRA.

2.3.5 Other Decommissioning Activities

The adjacent Remote Analytical Laboratory (CPP-627) was removed to grade as part of a NTCRA in 2005 in accordance with Action Memorandum for the Decontamination and Decommissioning of Building CPP-627, the Remote Analytical Facility (DOE-ID 2004). The concrete slab at grade, including
inactive/abandoned lines, was capped with an engineered barrier to reduce infiltration. The lines had previously managed RCRA waste and are identified as inactive/abandoned portions of the INTEC liquid waste management system in the Volume 14 RCRA Permit. The potential contamination beneath the slab as well as the lines within and below the slab are not included within the scope of this NTCRA and will be addressed at a later date as part of the final RCRA closure of the INTEC Liquid Waste Management System.

Decommissioning of the several low-risk INTEC facilities as well as initial preparatory actions for decommissioning the CPP-601/640 Fuel Reprocessing Facilities have begun in accordance with the *Action Memorandum for General Decommissioning Activities under the Idaho Cleanup Project* (DOE-ID 2006). The actions at CPP-601/640 Fuel Reprocessing Facilities include asbestos abatement, utility isolation, decontamination, removal of the PM/HM Deck components, and removal of accessible HWMA/RCRA and “Toxic Substances Control Act (TSCA) of 1976” (15 USC § 2601 et seq.) regulated materials. This removal of HWMA/RCRA and TSCA-regulated materials includes, but is not limited to, lead, circuit boards, mercury switches, ballasts, and fluorescent tubes. These materials are being characterized and dispositioned according to appropriate regulatory requirements as they are removed. These activities include:

1. **Asbestos abatement**: Decommissioning preparatory activities also include removal of friable asbestos that might be found in pipe and tank/vessel insulation, fire doors, Transite panels, and other potential asbestos-containing material, as required under 40 CFR 61.145, “Standard for Demolition and Renovation.”

2. **PCB bulk product waste**: PCB bulk product waste in CPP-601/640 will be managed in accordance with its radioactive properties as allowed under the PCB regulations. These materials will be left in place with the other radioactive components left in the building before backfilling with grout or other inert material. PCB regulations (40 CFR 761.50[b][7]) allow disposal of PCB/radioactive waste based on its radioactive properties. Under 40 CFR 761.62(b), the following types of PCB bulk product waste may be disposed based on the radioactive properties: plastics; preformed or molded rubber parts and components; applied dried paints, varnishes, waxes or other similar coatings or sealants; caulking; Galbestos; non-liquid building demolition debris; and other PCB bulk product waste demonstrated to leach less than 10 µg/L of water.

3. **Removal of other support systems and components from the CPP-601/640 Fuel Reprocessing Facilities**: These activities include draining or emptying systems containing liquids and removing and properly managing electrical cabinets, hoods, sinks, mixing tanks, and counters according to the waste characterization. These activities also include de-energizing and isolating utilities, and reconfiguring those systems (as necessary) to support continuing INTEC operations. Waste regulated under TSCA such as PCB articles and equipment (e.g., transformers, capacitors, and fluorescent lighting) is being removed. PCBs found on painted surfaces and those meeting the definition of PCB bulk product waste will not be removed.

### 2.4 Radiological Risk and Minimizing Dose

Under the selected alternative, a significant number of radioactively contaminated vessels, along with associated piping, will be encapsulated in grout and incorporated into the concrete monolith. These vessels and piping have been subject to significant decontamination activities primarily driven by uranium accountability, VCO, or the need to reduce activity to allow hands-on maintenance in the vicinity of the vessels or piping. These decontamination activities included: acid washes, caustic washes, chelating agents, and water rinses that left only such residual fixed contamination on the interior walls of the vessels and piping as is virtually unleachable. As part of the decontamination and decommissioning...
(D&D) of the facility, additional rinses and sampling are underway to confirm the effectiveness of the previous decontamination efforts.

Filling the CPP-601/640 facilities with grout to create a concrete monolith and then placing an earthen cover over the entire facility will create a stable long-lasting configuration that reduces precipitation infiltration, thereby minimizing any potential releases of radioactivity to the groundwater. This earthen-covered concrete monolith reduces long-term risk, minimizes short-term worker risk and radiation exposure, provides a safe and stable configuration that is environmentally sound, and minimizes any potential releases to the general environment. This end state is consistent with the DOE goal to reduce risk and minimize long-term surveillance and maintenance costs.

In accordance with DOE M 435.1, Chapter IV, “Low-Level Waste Requirements,” the entire radiological inventory in CPP-601/640 was subjected to a dose assessment that demonstrated compliance with the substantive requirements of a performance assessment and composite analysis. This dose assessment projected that the peak dose to members of the public was less than the limit of 25 mrem/yr (see 10 CFR 61.41, concerning low-level waste). The dose assessment projected a peak dose of 0.03 mrem/yr within the first 1,000 years, a peak dose of 1.0 mrem/yr within the first 10,000 years, and an overall peak dose of 1.5 mrem/yr predicted to occur at approximately 15,000 years beyond closure. For the purposes of the composite analysis, the dose assessment also compared the projected peak dose of 0.03 mrem/yr within the first 1,000 years to that of nearby facilities for the same timeframe. That comparison showed that the CPP-601/640 facilities contribution (0.03 mrem/yr) to the existing composite analyses (Idaho CERCLA Disposal Facility [ICDF]) 8 mrem/yr, TFF 5 mrem/yr) was less than the threshold trigger (less than 25% increase), and did not significantly add to the composite dose. The remaining radiological inventory in the CPP-601/640 facilities will be updated and documented upon completion of the NTCRA to ensure that the cumulative impacts of radioactive contamination sources that could add to the dose and risk to future members of the public can be evaluated (i.e., to support future composite analyses for the surrounding facilities as necessary).

In the OU 3-14 ROD, the agencies agreed that residential use in the area surrounding the TFF (including the locations of the CPP-601/640) was not a reasonably anticipated future use and that the area would remain an industrial land use area in the future. Therefore, only an acute well driller intruder scenario was evaluated (10 CFR 61.42, “Protection of Individuals from Inadvertent Intrusion.” The projected risk was 6E-07, below the EPA target risk range of 1E-04 to 1E-06.

For comparative purposes, an analysis of the NTCRA was performed, showing that the end state would perform similarly to the risk and dose assessments that apply at a low-level waste disposal facility. That evaluation confirmed that projected risk and dose were well within the acceptable range. The remaining contamination will be incorporated in a solid physical form and will be at a concentration that is significantly below the limits established for the nearby ICDF (i.e., less than Class C low-level waste concentration limits in 10 CFR 61.55, “Waste Classification” concerning low-level waste). The Department intends to exercise control of the closure site until it can be safely released pursuant to DOE O 5400.5.

An effective “as low as reasonably achievable” (ALARA) process will be implemented in the execution of any work, consistent with DOE's regulations in 10 CFR 835, “Occupational Radiation Protection.” Alternative or innovative approaches to work will be investigated, so that the overall risk and dose to workers is reduced to the extent practical. The approach will include the consideration, planning, and implementation of both reasonable physical design features (including engineering controls), and administrative controls before workers don personal protective equipment and respiratory protection. By conducting an effective ALARA process, worker risk of occupational radiation exposure is balanced against the benefits arising out of the authorized activity. Lessons learned are considered in planning and
executing subsequent activities to further strengthen the ALARA process and to provide optimal employee protection.

2.5 State and Local Authorities Role

This Action Memorandum for decommissioning the CPP-601/640 Fuel Reprocessing Facilities at DOE’s INL Site is conducted by DOE with the concurrence of EPA and DEQ.

3. THREAT TO PUBLIC HEALTH, WELFARE, AND/OR THE ENVIRONMENT

The source of contamination in the building or structures addressed by this Action Memorandum has been characterized or estimated based on process knowledge and using conservative assumptions. In general, contamination at this facility resulted from activities associated with the reprocessing of spent nuclear fuel. Various resources were used to help identify the hazardous substances and the nature and extent of contamination in the facilities. These resources included: historical operations information, process knowledge, radiological survey reports, radiation occurrence reports, facility assessment reports, personnel interviews, facility characterization reports, vulnerability assessments, inspections, walkdowns, and knowledge of construction materials.

To the extent practicable, hazardous substances—including lead, mercury, and PCBs—have been or will be removed from the facilities. However, residual contamination may remain on facility surfaces, in piping and ductwork, and in structural materials.

The major contaminants of concern within the building and structures subject to this removal action are radionuclides. The current inventory of radionuclides is bounding of the inventory that will remain upon completion of this NTCRA (712 Ci.).

The “National Oil and Hazardous Substances Pollution Contingency Plan” (40 CFR 300.415[b][2]) establishes factors to be considered in determining the appropriateness of a removal action. Those factors include the following:

- Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants, or contaminants
- Weather conditions that may cause hazardous substances, pollutants, or contaminants to migrate or be released
- Hazardous substances or pollutants in drums, barrels, tanks, or other bulk storage containers that may pose a threat of release.

Hazardous substances, including radionuclides, are present within the equipment, structures, and vessels of the CPP-601/640 facilities. If the CPP-601/640 facilities are not properly maintained in the future, potential releases could occur that may pose an unacceptable risk to receptors. The external radiation, inhalation, and ingestion risks to Site workers, the public, and ecological receptors associated with potential releases of contamination justify an NTCRA.
Conditions at this site meet the criteria for NTCRA as stated in the National Contingency Plan, 40 CFR 300.415, as follows:

A. Threats to Public Health or Welfare

1. Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations or the food chain [300.415(b)(2)(i)].

While access to the site is restricted, there is the potential that over time the structure will decay and the radionuclides could be released into the environment. This would create the potential for exposure to high concentrations of radionuclides by inhalation of wind-blown dust from debris or direct ingestion of contaminated soils by both nearby populations and users of the site. The location of the CPP-601/640 Fuel Reprocessing Facilities is approximately 9 miles from the INL Site boundary. The land use of the property outside of the INL Site boundary is agriculture, including grazing and other agriculture uses.

2. Weather conditions that may cause hazardous substances, pollutants, or contaminants to migrate or be released [300.415(b)(2)(v)].

Seasonal weather extremes at the INL Site vary from subzero winter conditions to summer temperatures in excess of 100ºF. Additionally, windy conditions are common. This exposure to the elements will contribute to the eventual degradation of the building and potential release of contaminants to the environment and transport by wind to receptors.

3. High levels of hazardous substances or pollutants largely at or near the surface that may migrate [300.415(b)(2)(iv)].

The total activity from radionuclides at this site is 712 Ci, which when stabilized within the concrete monolith represents a long-term groundwater cancer risk of 2-in-1,000,000. However, if no action were taken, this contamination could be transported by intruders or by wind, presenting a greater short-term threat to potential receptors.

4. ENDANGERMENT DETERMINATION

Actual or threatened release of hazardous substances from the site, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

As the CPP-601/640 Fuel Reprocessing Facilities continue to age, the threat of substantial release of radiological and hazardous substances increases with time, and containing these materials and preventing them from being released to the environment becomes more difficult. The surveillance and maintenance (S&M) activities required to confine the hazardous substances may increase the risk of potential exposure to personnel.

The potential exposure to workers, the potential threat of future releases, and the substantial risks associated with the radiological and hazardous substances at the facility addressed by this Action Memorandum, justify use of CERCLA removal action authority in accordance with 40 CFR 300.415(b)(2) of the “National Oil and Hazardous Substances Pollution Contingency Plan.” Actual or threatened releases of hazardous substances from these facilities could present a threat to public health or the environment.
4.1 Removal Action Objectives

The RAOs for this NTCRA are consistent with the CERCLA risk range established for site-related exposures under the NCP (40 CFR 300), which is 1E-4 to 1E-6. The agencies agree that acceptable risk for this NTCRA is at the upper end of this range (1E-4) based on (1) the conservative nature of the risk assessment, (e.g., it is unlikely there will be future industrial re-use of the NTCRA site; therefore, worker exposure is anticipated to be much less than 40 hours per week for 25 years); (2) use of the 1E-4 risk-based level in the OU 3-13 and OU 3-14 RODs as well as for all CERCLA soil sites at INTEC (which surround this NTCRA); and (3) the isolation of the INL Site. These RAOs achieve the following:

- Reduce risk from external radiation exposure to Cs-137 for current and future workers to a total excess cancer risk of less than 1E-4 (1 in 10,000)
- Prevent release of contaminants to the SRPA that could result in exceeding the drinking water maximum contaminant levels (MCLs), a cumulative cancer risk from all carcinogens of 1E-4 (1 in 10,000, or a Hazard Index of 1
- Prevent unacceptable internal exposure to biota that would result in the lack of maintenance or recovery of healthy local populations/communities of ecological receptors.

In addition to the remediation objectives established through the Federal Facility Agreement/Consent Order process, the selected alternative should incorporate the DOE goal of reducing the risk and long-term S&M costs on legacy buildings and structures.

Actions conducted under this NTCRA would be reviewed with DEQ and EPA for continued protectiveness during the Sitewide CERCLA 5-year review process, prescribed under the Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory (DOE-ID 1991).

4.2 Engineering Evaluation/Cost Analysis

Engineering Evaluation/Cost Analysis for the Decommissioning of CPP-601/640 Fuel Reprocessing Facilities (DOE-ID 2008) is available through the Administrative Record for the removal action, and can be found at the following internet address: http://ar.inel.gov.

Two alternatives and a No Action alternative were evaluated in the EE/CA for the CPP-601/640 Fuel Reprocessing Facilities. These alternatives are described in detail in the EE/CA. The recommended alternative is Alternative 2 with slight modifications. The selected alternative demolishes the building to PM/HM deck level (with the exception of the P, Q, and R cell extensions and the bottom 2.5 ft of the MHC), fills void spaces with grout or other inert material, and places an earthen cover over the resultant concrete monolith. The three alternatives are presented below as they were described in the EE/CA (i.e., without the modifications triggered as a result of the public comment process). The revised Alternative 2 is described in Section 4.3.

4.2.1 Alternative 1—No Action

Alternative 1 is a hypothetical and conservative baseline established for comparison reasons. The primary assumption is that at some point in the future, the sum of identified radiological and nonradiological contamination would not be properly contained or controlled and would be released to the environment, causing an unacceptable potential risk to receptors (current and future workers, groundwater receptors, and the environment). This alternative is for comparative purposes only, and does not reflect the DOE activities to monitor, maintain, and mitigate potential or actual release from any facility or site to ensure protection of the public and the environment.
4.2.2 Alternative 2—Demolition to Process Makeup/Hot Makeup Decks

Alternative 2 includes structural demolition to the PM/HM deck floor elevations. This alternative removes portions of three process cells along with building and components to 11 ft. above grade, and leaves 27 of the 30 process cells in CPP-601/640 intact. This alternative does remove the MHC. Of the three process cells requiring partial demolition, only one is considered highly contaminated. Process vessels, lines, and cells are decontaminated, and the radiological and hazardous source terms reduced as necessary to meet RAOs and RGs. Large void spaces without significant piping or vessels may be filled with grout or other inert material. The remaining void spaces within the building will be filled with flowable grout to minimize void space, leaving a grouted monolith above grade similar to the Waste Calcining Facility. The top surface of the monolith will be sloped to integrate precipitation control with the OU 3-14 remedial action as practical, wherein the collected precipitation will be directed toward lined ditches, which will divert the water to evaporation ponds. The concrete monolith will require routine maintenance, monitoring, and ICs to ensure that future worker risk remains acceptable until the earthen cover is installed.

4.2.3 Alternative 3—Demolition to Grade

Alternative 3 removes the CPP-601/640 buildings/components to grade. This alternative includes removal or displacement of the vessels and piping located within cells. Remaining below-grade process vessels, lines, and cells are decontaminated and the radiological and hazardous source terms reduced as necessary to meet RAOs and RGs. Large void spaces without significant piping or vessels may be filled with grout or other inert material. The remaining void spaces within the building will be filled with flowable grout to minimize void space, leaving a below-grade grouted monolith. The top surface of the monolith will be sloped to integrate precipitation control with the OU 3-14 remedial action as practical, wherein the collected precipitation will be directed toward lined ditches, which will divert the water to evaporation ponds. The concrete monolith will require routine maintenance, monitoring, and ICs to ensure that future worker risk remains acceptable.

4.3 Selected Alternative

The alternatives presented and evaluated in the EE/CA were discussed in Section 4.2. The selected alternative is Alternative 2, with slight modifications. The selected alternative includes removing the tops of the buildings to the PM/HM deck level (with the exception of the P, Q, and R cell extensions and the bottom 2.5 ft of the MHC). The selected alternative also removes that portion of CPP-640 above grade that is not part of the process cells. This leaves all 30 process cells intact, reducing current worker risk without having significant impact on long-term risk to human health and the environment. Void spaces are filled with grout or other inert material and an earthen cover is placed over the remaining concrete monolith.

The selected alternative meets the RAOs regarding long-term risk, minimizes short-term worker risk and radiation exposure, is cost effective, and provides a safe and stable configuration that is environmentally sound. The end state provided by Alternative 2 is consistent with the DOE goal to reduce risk and minimize long-term surveillance and maintenance costs.

Under the selected alternative, the portions of the facility above the PM/HM deck floors (with the exception of the tops of P, Q, and R cells and the bottom 2.5 ft. of the MHC) and the abovegrade portions of CPP-640 outside the process cells will be removed and dispositioned according to the appropriate waste characterization documentation. Accessible bulk lead and asbestos, along with items that would represent unacceptable risk with respect to the RAOs and RGs, will be removed and appropriately dispositioned. Radiologically-contaminated vessels and piping left in place will be encapsulated as the
arates below the PM/HM deck are filled with grout or other inert material. Vessels and larger piping will also be filled with grout or other inert material to reduce the remaining void space to the extent practical. Materials left in place that will be encapsulated in the concrete monolith include inert, nonputrescible material such as piping, equipment, electrical conduit, utility systems, structural steel, and other residual clean or contaminated materials with low-level radioactive and/or chemically hazardous substances that do not present an unacceptable risk in accordance with the RAOs for the ROD (DOE-ID 2007a). VCO activities will be completed and RCRA tanks and ancillary lines will be closed outside the scope of this NTCRA.

The two primary reasons to fill the facility with grout or other inert material are to prevent subsidence and to extend the long-term integrity of the building acting as an umbrella to reduce infiltration into the soils below the building. Flowable grouts will be required in areas of complex geometry (i.e., multiple pipes and vessels located closely together as well as in the interior of the larger piping and vessels). A grouting/inert material fill plan shall be developed to ensure that void spaces are filled such that remaining void spaces including any unfilled smaller pipes and vessels will constitute less than 5% of each building by volume. Piping and utilities that penetrate the exterior of the CPP-601/640 facilities will also be plugged or capped.

Figure 4-1 shows the interim end state of this alternative awaiting the final earthen cover. The final earthen cover will not be designed until approximately 2035 upon closure of the surrounding facilities such that one integrated earthen cover will meet multiple requirements. The minimum requirements are that the outer surface of the concrete monolith be at least 4 ft from the surface. The earthen cover shall be sloped so as to eliminate ponding and reduce water infiltration. A comment received from the INL Citizen Advisory Board recommended various sealing approaches such as clays or other improved technologies such as elastomers be investigated at that time. While not required to meet acceptable risk levels, they may increase the protectiveness of the selected alternative.

![Figure 4-1. Selected alternative, interim end state awaiting final earthen cover.](image-url)
Waste generated in support of decommissioning the CPP-601/640 Fuel Reprocessing Facilities will be managed in accordance with the applicable WAC. Radiologically contaminated nonhazardous waste will be disposed of in the ICDF (DOE-ID 2007b). Waste that is nonhazardous and is not radiologically contaminated will be disposed of at the INTEC CERCLA Demolition Waste Landfill or at the Central Facilities Area Landfill. For waste generated that does not meet the applicable WACs for the above facilities, a suitable off-site disposal location will be determined (e.g., Energy Solutions, Clive, Utah).

The OU 3-14 ROD identified ICs for the industrial use area that will be applicable to the CPP-601/640 facility (residing within that industrial use area) upon completion of D&D. Those ICs include ensuring the industrial use area remains industrial, that warning signs be posted, that land transfer controls be placed in effect, that drilling be restricted, that soil disturbances be controlled, and that the integrity of monitoring systems be preserved. These ICs, in conjunction with the implementation of an operation and maintenance plan specifying routine monitoring and maintenance of the concrete monolith and earthen cap, will ensure that the selected remedy for CPP-601/640 remains protective of human health and the environment. These requirements are expected to be incorporated into the institutional control plans and operations and maintenance plans that will be implemented and maintained by the Long-Term Stewardship Program.

Control of precipitation runoff from the concrete monolith will be integrated with the OU 3-14 Recharge Control Zone to the extent practical, diverting the collected precipitation through lined ditches away from areas of contamination. The concrete monolith will require periodic monitoring and maintenance until completion of DOE’s operational activities at INTEC, at which time an earthen cover will be placed over the concrete monolith and integrated with the surrounding facilities. These facilities include the TFF, Calcine Bin Sets, New Waste Calcining Facility, PEW Evaporator, Integrated Waste Treatment Unit, and other miscellaneous facilities.

4.4 Compliance with Environmental Regulations, Including Those That Are Applicable or Relevant and Appropriate Requirements

Section 121 of CERCLA (42 USC § 9621) requires the responsible CERCLA implementing agency to ensure that the substantive standards of HWMA/RCRA and other applicable laws will be incorporated into the federal agency’s design and operation of its long-term remedial actions and into its more immediate removal actions. DOE-ID is the implementing agency for this NTCRA. Both DEQ and EPA concur that an NTCRA is warranted to protect human health and the environment. Through the NTCRA process, the risks presented in this document will be mitigated in a timely manner.

Table 4-1 lists the proposed applicable or relevant and appropriate requirements (ARARs) that have been identified for this removal action. These ARARs are a compilation and expansion of the ARARs identified in the ROD (DOE-ID 2007a). The ARARs list is based on several key assumptions:

- Contamination left in place will meet the RAOs and RGs established in the OU 3-14 ROD (DOE-ID 2007a).
- Waste generated in support of the CPP-601/640 NTCRA will be managed as CERCLA waste. Waste solids that also meet the definition of a hazardous waste or mixed low-level waste shall be managed in accordance with the substantive requirements of the HWMA/RCRA (IDAPA 58.01.05.008). CERCLA wastes meeting the applicable WAC may either be disposed of at ICDF or at an off-site disposal facility with a current EPA suitability determination. HWMA/RCRA regulated wastes will be disposed of at an off-site disposal facility. Examples include bulk lead solids, mercury switches, and circuit boards.
As part of this NTCRA, bulk lead solids will be removed to the extent practical from the CPP-601/640 buildings and will be shipped off-site to a RCRA-permitted treatment, storage, or disposal facility. However, some lead, such as difficult-to-remove lead that is enclosed within the building structure, may remain in place following these activities.

Liquids will be drained from equipment, vessels, and piping and will generally be sent to the permitted tank system in CPP-601 for later transfer to the PEW Evaporator for treatment. Liquid waste in the permitted or interim status tank systems within CPP-601/640 will be removed to the extent practical and will generally be sent to the PEW Evaporator for treatment. If other decontamination liquids are generated, they will most likely be disposed of at the PEW Evaporator or ICDF evaporation ponds subject to meeting the applicable WAC.

CERCLA waste generated in support of the NTCRA that does not meet the definition of hazardous waste or mixed low-level waste will be disposed of at the ICDF Landfill, Central Facilities Area (CFA) Landfill, or the INTEC CERCLA Demolition Waste Landfill subject to meeting the applicable WAC.

Debris generated during demolition of the CPP-601/640 may contain paint or other materials contaminated with PCBs. When removed, such wastes may trigger the substantive requirements of TSCA. These wastes will be disposed of at either the ICDF or to an off-site facility upon demonstration of compliance with the applicable WAC.

Asbestos-containing material, which is both friable and nonfriable, may be encountered incidental to performance of the NTCRA. Friable or regulated asbestos-containing material is subject to specific asbestos regulations and would be acceptable for disposal at ICDF or, if not radiologically contaminated, at the CFA Asbestos Landfill. Regulated asbestos will be removed and disposed of as required by 40 CFR 61.150, “Standard for Waste Disposal for Manufacturing, Fabricating, Demolition, Renovation, and Spraying Operations.” Undisturbed asbestos or asbestos found in high-radiation, high-contamination, or inaccessible locations may be left in place thereby being incorporated into the concrete monolith.

Investigation Derived Waste (IDW) generated during NTCRA related activities that are not substantially altered during the sampling or characterization process and not derived from a HWMA/RCRA regulated system may be managed consistent with the final end state of the facility if the final disposition of the IDW is protective of human health and the environment and complies with the ARARs.
Table 4-1. Summary of applicable or relevant and appropriate requirements for the CPP-601/640 Fuel Reprocessing Facilities non-time-critical removal action.

<table>
<thead>
<tr>
<th>Requirement (Citation)</th>
<th>ARAR Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clean Air Act and Idaho Air Regulations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Toxic Substances,” IDAPA 58.01.01.161</td>
<td>A</td>
<td>Applies to any toxic substances emitted during implementation of the removal action.</td>
</tr>
<tr>
<td>“National Emission Standards for Hazardous Air Pollutants,” &lt;10 mrem/yr, 40 CFR 61.92</td>
<td>A</td>
<td>Applies to building demolition and waste-handling activities.</td>
</tr>
<tr>
<td>“National Emission Standards for Hazardous Air Pollutants,” “Compliance and Reporting,” 40 CFR 61.94(a)</td>
<td>A</td>
<td>Applies to building demolition and waste-handling activities.</td>
</tr>
<tr>
<td>“Rules for Control of Fugitive Dust,” and “General Rules,” IDAPA 58.01.01.650 and .651</td>
<td>A</td>
<td>Applies to building demolition and waste-handling activities.</td>
</tr>
<tr>
<td><strong>RCRA and Idaho Hazardous Waste Management Act</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Standards Applicable to Generators of Hazardous Waste,” IDAPA 58.01.05.006, and the following, as cited in it:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Hazardous Waste Determination,” 40 CFR 262.11</td>
<td>A</td>
<td>Applies to waste generated during the removal action.</td>
</tr>
<tr>
<td><strong>General Facility Standards:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities,” IDAPA 58.01.05.008, and the following, as cited in it:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Temporary Units (TU),” 40 CFR 264.553</td>
<td>A</td>
<td>Waste may be treated or temporarily stored in a temporary unit before disposal.</td>
</tr>
<tr>
<td>“Staging Piles,” 40 CFR 264.554</td>
<td>A</td>
<td>Waste may be temporarily staged before disposal.</td>
</tr>
<tr>
<td>“General Inspections Requirements,” 40 CFR 264.15</td>
<td>A</td>
<td>Applies to a facility staging, storing, or treating hazardous waste before transfer to ICDF or an off-Site facility.</td>
</tr>
<tr>
<td>“Preparedness and Prevention,” 40 CFR 264, Subpart C</td>
<td>A</td>
<td>Applies to a facility staging, storing, or treating hazardous waste before transfer to ICDF or an off-Site facility.</td>
</tr>
<tr>
<td>“Contingency Plan and Emergency Procedures,” 40 CFR 264, Subpart D</td>
<td>A</td>
<td>Applies to a facility staging, storing, or treating hazardous waste before transfer to ICDF or an off-Site facility.</td>
</tr>
<tr>
<td>“Disposal or Decontamination of Equipment, Structures, and Soils,” 40 CFR 264.114</td>
<td>A</td>
<td>Applies to contaminated equipment used to remove, treat, or transport hazardous waste.</td>
</tr>
</tbody>
</table>
Table 4-1. (continued).

<table>
<thead>
<tr>
<th>Requirement (Citation)</th>
<th>ARAR Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land Disposal Restrictions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Land Disposal Restrictions,” IDAPA 58.01.05.011, and the following, as cited in it:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Applicability of Treatment Standards,” 40 CFR 268.40(a)(b)(e)</td>
<td>A</td>
<td>Applies to hazardous waste and secondary waste, if treatment is necessary to meet the disposal facility’s WAC or if treatment is required before placement.</td>
</tr>
<tr>
<td>“Treatment Standards for Hazardous Debris,” 40 CFR 268.45</td>
<td>A</td>
<td>Applies to hazardous debris, if treatment is necessary to meet the disposal facility’s WAC or if treatment is required before placement.</td>
</tr>
<tr>
<td>“Universal Treatment Standards,” 40 CFR 268.48(a)</td>
<td>A</td>
<td>Applies to nondebris hazardous waste and secondary waste, if treatment is necessary to meet the disposal facility’s WAC or if treatment is required before placement.</td>
</tr>
<tr>
<td>“Alternative LDR Treatment Standards for Contaminated Soil,” 40 CFR 268.49</td>
<td>A</td>
<td>Applies to contaminated soil, if treatment is necessary to meet the disposal facility’s WAC or if treatment is required before placement.</td>
</tr>
<tr>
<td>“Standards for Universal Waste Management,” IDAPA 58.01.05.016</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Idaho Groundwater Quality Rules</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Ground Water Quality Rule,” IDAPA 58.01.011</td>
<td>A</td>
<td>The waste-handling activities shall prevent migration of contaminants from the facility that will cause the SRPA groundwater to exceed applicable State of Idaho groundwater quality standards in 2095 and beyond. The State of Idaho Ground Water Quality Rule’s regulated levels of contaminants are equivalent to the Safe Drinking Water Act (42 USC § 300f et seq.) MCLs.</td>
</tr>
<tr>
<td><strong>TSCA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Decontamination Standards and Procedures: Decontamination Standards,” 40 CFR 761.79(b)(1)</td>
<td>A</td>
<td>Applicable to decontamination of equipment with PCB contamination, if PCB waste is generated.</td>
</tr>
<tr>
<td>“Decontamination Standards and Procedures: Self-Implementing Decontamination Procedures,” 40 CFR 761.79(c)(1) and (2)</td>
<td>A</td>
<td>Applicable to decontamination of equipment with PCB contamination, if PCB waste is generated.</td>
</tr>
<tr>
<td>“Disposal in Solid Waste Landfills,” 40 CFR 761.62(b)</td>
<td>A</td>
<td>Applicable to disposition of waste in a NMSWLF with concentrations of PCBs greater than 50 ppm.</td>
</tr>
<tr>
<td>“Decontamination Standards and Procedures: Decontamination Solvents,” 40 CFR 761.79(d)</td>
<td>A</td>
<td>Applicable to decontamination of equipment used to manage PCB-contaminated waste, if PCB waste is generated.</td>
</tr>
<tr>
<td>“Decontamination Standards and Procedures: Limitation of Exposure and Control of Releases,” 40 CFR 761.79(e)</td>
<td>A</td>
<td>Applicable to decontamination activities of equipment with PCB-contaminated waste, if decontamination is performed.</td>
</tr>
<tr>
<td>“Decontamination Standards and Procedures: Decontamination Waste and Residues,” 40 CFR 761.79(g)</td>
<td>A</td>
<td>Applicable to management of decontaminated waste and residuals from PCB-contaminated equipment, if PCB waste is generated.</td>
</tr>
</tbody>
</table>
Table 4-1. (continued).

<table>
<thead>
<tr>
<th>Requirement (Citation)</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Solid Waste Management Rules</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Applicable Requirements for Tier II Facilities” IDAPA 58.01.06.012</td>
<td>A</td>
<td>Applicable to operation and management of CFA Landfill and INTEC CERCLA Demolition Waste Landfill.</td>
</tr>
<tr>
<td><strong>Migratory Bird Treaty Act of 1918</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Protection of Migratory Game and Insectivorous Birds,” 16 USC § 7 et seq.</td>
<td>A</td>
<td>Applicable to disturbances of nesting migratory birds.</td>
</tr>
<tr>
<td><strong>Relevant and Appropriate Requirements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Protection of the general population from releases of radioactivity.” 10 CFR 61.41</td>
<td>R&amp;A</td>
<td>Relevant and appropriate for evaluation of residual radioactive contamination left in place upon completion of NTCRA.</td>
</tr>
<tr>
<td>Protection of individuals from inadvertent intrusion,” 10 CFR 61.42.</td>
<td>R&amp;A</td>
<td>Relevant and appropriate for evaluation of residual radioactive contamination left in place upon completion of NTCRA.</td>
</tr>
<tr>
<td><strong>To-be-Considered Requirements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Radiation Protection of the Public and the Environment,” DOE O 5400.5, Chapter II(1)(a) and (b)</td>
<td>TBC</td>
<td>Substantive design and construction requirements to keep public exposures as low as reasonably achievable.</td>
</tr>
<tr>
<td>“Radioactive Waste Management,” DOE O 435.1</td>
<td>TBC</td>
<td>Management of CPP-601/640 before, during, and after the removal action including substantive design, construction, and management requirements.</td>
</tr>
<tr>
<td>“Ground Water Quality Rule,” IDAPA 58.01.011</td>
<td>TBC</td>
<td>The State of Idaho Ground Water Quality Rule’s regulated levels of contaminants are equivalent to the Safe Drinking Water Act (42 USC § 300f et seq.) MCLs. The waste-handling activities must prevent migration of contaminants from the reactor complex that would cause the SRPA to exceed applicable State of Idaho/Safe Drinking Water Act groundwater quality standards in 2095 and beyond.</td>
</tr>
</tbody>
</table>

A = applicable requirement  
ARAR = applicable or relevant and appropriate requirement  
CFA = Central Facilities Area  
CFR = Code of Federal Regulations  
DOE = Department of Energy  
EPA = Environmental Protection Agency  
ICDF = Idaho CERCLA Disposal Facility  
IDAPA = Idaho Administrative Procedures Act  
MCL = maximum contaminant level  
NMSWLF = Non-Municipal Solid Waste Landfill  
PCB = polychlorinated biphenyl  
R&A = relevant and appropriate requirement  
RCRA = Resource Conservation and Recovery Act  
SRPA = Snake River Plain Aquifer  
TAN = Test Area North  
TBC = to be considered  
TSCA = Toxic Substances Control Act  
USC = United States Code  
WAC = Waste Acceptance Criteria

a. If clean-closure requirements are not met, facility will require closure under HWMA/RCRA.
4.5 Cultural Resources

Section 106 of the National Historic Preservation Act of 1966 (16 USC § 470 et seq.), as amended, requires agencies to consider the impact of undertakings on properties listed or eligible for listing in the National Register of Historic Places, and to consult with the Idaho State Historic Preservation Officer (SHPO) and other interested parties when impacts are likely. It also requires federal agencies to invite the Advisory Council on Historic Preservation to participate in consultation when impacts may be adverse. Section 110 of the National Historic Preservation Act directs federal agencies to establish programs to find, evaluate, and nominate eligible properties to the National Register of Historic Places, including previously unidentified historic properties that may be discovered during the implementation of a project (36 CFR Part 800). In addition, the Archaeological Resources Protection Act of 1979 (16 USC § 470aa–470mm), as amended, provides for the protection and management of archaeological resources on federal lands. Procedures and strategies to tailor these requirements to the unique needs of the INL Site are described in the Idaho National Laboratory Cultural Resource Management Plan (DOE-ID 2007b). This plan is implemented through a Memorandum of Agreement between the United States Department of Energy, Idaho Operations Office, and the Idaho State Historic Preservation Office (DOE-ID 2005, Appendix K).

CPP-601 and CPP-640 are historic properties eligible for nomination to the National Register of Historic Places. CPP-601 has been designated as a Signature Property by DOE Headquarters. Since DOE-ID has decided to proceed with demolition of CPP-601/640 facilities and CPP-601 is a Signature Property, public review of facility disposition is required. To mitigate adverse impacts caused by such action, DOE-ID, through formal consultation with the Idaho SHPO, developed the Memorandum of Agreement (DOE-ID 2005) outlining measures to preserve the CPP-601/640 history through completion of a Historic American Engineering Record report on the Spent Nuclear Fuel structures and process. The Memorandum of Agreement stipulated that the draft Historic American Engineering Record report would be approved by the SHPO and National Park Service before beginning decontamination and decommissioning actions. The final report was submitted in 2006 and approved by the SHPO and National Park Service, and the project has received clearance to proceed from the INL Cultural Resource Management Office.

DOE is required to review as guidance the most current U.S. Fish and Wildlife Service list for threatened and endangered plant and animal species. DOE-ID determined that none of the alternatives would impact any threatened and endangered species and also determined that formal consultation with the U.S. Fish and Wildlife Service is not required for this action.

4.6 ICDF Waste Acceptance Criteria

The ICDF is an on-Site disposal facility that accepts CERCLA waste generated at the INL Site. Waste that meets the WAC for disposal at the ICDF will be disposed there.

5. PROJECT SCHEDULE

Final decommissioning activities are expected to commence upon issuance of this Action Memorandum. The activities under this removal action to reach the final end state are expected to take several years to complete and will be accomplished in three phases. The first phase will be to place CPP-601/640 in a demolition ready state. The second phase will be to complete the actual demolition and to complete the concrete monolith. The third phase will be to place an earthen cover over the concrete monolith. Phase 1 will be completed by 2012, but depends on completion of those activities being conducted outside the scope of this NTCRA (e.g., the HWMA/RCRA closure of the tank systems).
Phase 2 will be completed by 2013. The completion of Phase 3 will be coordinated with the closure of the remaining facilities at INTEC. These facilities include the TFF, Calcine Bin Sets, New Waste Calcining Facility, PEW Evaporator, Integrated Waste Treatment Unit, and other miscellaneous facilities.

Activities to be completed in Phase 1 include: removal and disposition of accessible bulk lead; asbestos abatement; utility isolation; removal of the PM deck components; removal of the upper portions of the MHC more than 2.5 ft above the HM deck; removal of accessible HWMA/RCRA and TSCA-regulated materials; and removal of any items that would represent an unacceptable risk with respect to the RAOs and RGs. Vessels and larger piping will be encapsulated and accessible void areas will be filled with grout or other inert material.

Activities to be completed in Phase 2 include removal and disposition of the CPP-601/640 walls and roof (including remaining ventilation, piping, utilities, and Transite panels) above the selected end-state level, completion of concrete monolith including a sloped sealing cover on top to integrate with the OU 3-14 remedial action to the extent practical to control precipitation infiltration within the recharge control zone, implementation of operation and maintenance plan, and implementation of appropriate ICs.

Activities to be completed in Phase 3 include the design and installation of an earthen cover over the remaining concrete monolith in conjunction with the final end state for the facilities at INTEC. These facilities include the TFF, Calcine Bin Sets, New Waste Calcining Facility, PEW Evaporator, Integrated Waste Treatment Unit, and other miscellaneous facilities.

6. PROJECT COST

Cost estimates were prepared for the alternatives evaluated in the EE/CA (DOE-ID 2008b). The estimates were prepared in accordance with A Guide to Developing and Documenting Cost Estimates During the Feasibility Study (EPA 2000). Costs were calculated for both capital expenditures and future operation and maintenance expenses. In accordance with EPA guidance, the cost for the alternatives over time was calculated as present net worth costs, which are sometimes referred to as net present value, to represent the costs in 2007 dollars.

The cost estimate is based upon the best available information regarding the anticipated scope of the selected alternative. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design and performance of the removal action. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30% of actual project cost. The total estimated cost of the selected alternative is $81,300,000.

7. EXPECTED CHANGE SHOULD ACTION BE DELAYED OR NOT TAKEN

The expected change to the CPP-601/640 Fuel Reprocessing Facilities buildings and structures should action be delayed or not taken would be that the facilities would remain under administrative and institutional control. However, as the facilities continue to age, the threat of substantial release of radiological and hazardous substances increases with time, and containing these materials and preventing them from being released to the environment become more difficult. The S&M activities required to confine the hazardous substances may increase the risk of potential exposure to personnel. If the action was delayed, continued expenditures for S&M costs would accrue during the time interval elapsed until final decommissioning activities are performed.
8. STATUTORY AND REGULATORY AUTHORITY

The proposed removal action is being undertaken by DOE-ID, as the lead agency, pursuant to CERCLA, Section 104(a), “Response Authorities” (42 USC §9604), and Executive Order 12580, “Superfund Implementation,” as specified in section 5.3 of the Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory (DOE-ID 1991). In accordance with 40 CFR 300.415(j) and DOE guidance, on-site removal actions conducted under CERCLA are required to meet ARARs to the extent practicable considering the exigencies of the situation. DOE-ID will comply with the ARARs and the “to-be-considered” guidance as set forth in Section 4.4.

9. OUTSTANDING POLICY ISSUES

There are no outstanding policy issues.

10. ENFORCEMENT

DOE-ID is conducting this removal action as the lead agency under the authority of 40 CFR 300.5, “Definitions,” Executive Order 12580 and the Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory.

11. RECOMMENDATION

DOE-ID recommends implementation of Alternative 2, “Demolition to Process Makeup/Hot Makeup Decks.” This alternative includes removing the buildings to the PM/HM deck level, with the exception of the tops of the P, Q, and R cells and the bottom 2.5 ft of the MHC, filling the void spaces with grout or other inert material, and placing an earthen cover over the remaining concrete monolith. The selected alternative meets the RAOs regarding long-term risk, minimizes short-term worker risk and radiation exposure, is cost effective, and provides a safe and stable configuration that is environmentally sound. The end state provided by Alternative 2 is consistent with the DOE goal to reduce risk and minimize long-term surveillance and maintenance costs.

Waste that meets the ICDF WAC will be transported and disposed of as low-level radioactive waste at the ICDF. Materials left in place that will be encapsulated in the concrete monolith include inert, nonputrescible material located within the monolithic structure (primarily below the ground surface) such as piping, equipment, electrical conduit, utility systems, structural steel, and other residual clean or contaminated materials with low-level radioactive or chemically hazardous substances that do not present an unacceptable risk in accordance with the RAOs for the ROD (DOE-ID 2007a). Control of precipitation runoff from the concrete monolith will be integrated with the OU 3-14 Recharge Control Zone to the extent practical, diverting the collected precipitation through lined ditches away from areas of contamination. The concrete monolith will require periodic monitoring and maintenance until completion of DOE’s operational activities at INTEC, at which time an earthen cover will be placed over the concrete monolith and integrated with the surrounding facilities. This earthen cover integrated over the closed facilities will require periodic monitoring and maintenance to prevent erosion and maintain the integrity of the earthen cover.
12. PUBLIC PARTICIPATION

The public review period began on January 16, 2008, and concluded on February 15, 2008. Comments were received from the INL Citizen’s Advisory Board, Shoshone Bannock Tribal Commission, and one anonymous public citizen. Appendix A shows the comments received and responses provided.

13. REFERENCES


IDAPA 58.01.01.650, 1994, “Rules for Control of Fugitive Dust,” Idaho Administrative Procedures Act, Idaho Department of Environmental Quality.


IDAPA 58.01.06.012, 2003, “Applicable Requirements for Tier II Facilities,” Idaho Administrative Procedures Act, Idaho Department of Environmental Quality.


Appendix A

Responses to Significant Comments on the Engineering Evaluation/Cost Analysis for the CPP-601/Fuel Reprocessing Facilities
**Appendix A**


<table>
<thead>
<tr>
<th>Comment No.</th>
<th>Comment/Issue</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAB 1</td>
<td>The Idaho National Laboratory (INL) Site Environmental Management Citizens Advisory Board (CAB) would like to thank the Department of Energy (DOE) for allowing the CAB to comment on the Engineering Evaluation/Cost Analysis for Decommissioning of the CPP-601/640 Fuel Reprocessing Facilities. The CAB agrees with the preferred Alternative 2; however, the review of this document precipitated some questions, comments, and recommendations to Alternative 2.</td>
<td>Thank you for your review, questions, comments, and recommendations.</td>
</tr>
<tr>
<td>CAB 2</td>
<td>The CAB shares some concerns with Alternative 2. There will be exposure to workers as they remove the vessels in P, Q, and R cells. Once the vessels have been cut, additional or higher exposure may be encountered from within the vessels. The area is cramped, which increases concerns for the safety of the workers as they perform their duties.</td>
<td>Comments received have triggered a re-evaluation of the risk vs. benefit for removing that part of the P, Q, &amp; R cells that extends above the Process Makeup (PM) Deck and totally removing the Mechanical Handling Cave (MHC) down to the Hot Makeup (HM) Deck. This re-evaluation determined that removing the P, Q, and R cells would result in very little long-term risk reduction, but would increase both the industrial and radiological risk to workers in order to remove the elevated vessels and piping within those areas, especially the P cell which is considered a highly radiologically contaminated work area. Similar issues are raised in removing the MHC to be level with the HM Deck. Based upon this re-evaluation it has been determined that the tops of P, Q, and R cells and the lower portion of the MHC will not be removed. The selected remedy has been modified accordingly to incorporate the comment received from the Citizen's Advisory Board.</td>
</tr>
<tr>
<td>Comment No.</td>
<td>Comment/Issue</td>
<td>Response</td>
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<tr>
<td>CAB 3.</td>
<td>The CAB questions why the asbestos should be removed if those areas will also be grouted. The CAB recommends that the asbestos be left in place and grouted as well.</td>
<td>Most of the asbestos in CPP-601/640 is found in areas typically occupied by operators, i.e., relatively low dose areas. Most of the asbestos is at locations easily accessible to the worker and does not require working at heights or in areas with significant radiological contamination. If asbestos is found in work locations that pose an increase to worker risk due to higher radiological dose or industrial safety hazards, removal will be reconsidered and discussed with the regulatory agencies.</td>
</tr>
<tr>
<td>CAB 4.</td>
<td>The CAB feels that the removal of lead from the various areas in CPP-601/640 may have an additional radiological impact on the workers that are removing the lead. If the sheets of lead or the bricks are removed, a radiation control technician should be present as this work is being performed. There is additional concern for the workers as they handle the lead. Some of the lead may have fixed contamination embedded that would create additional exposure to the hands. The CAB recommends that the lead placed in areas to reduce high radiation exposure be left in place and grouted as is.</td>
<td>As noted in the Engineering Evaluation/Cost Analysis (EE/CA), there are two areas within CPP-601/640 where lead is inaccessible and expected to be impractical to remove. As work progresses, other areas may be identified where it is impractical to remove lead. If additional areas are identified where there is a significant increase in worker risk to remove due to radiological conditions and industrial hazards and there is a lack of benefit (i.e., no decrease in risk to human health and the environment), the regulatory agencies will be contacted to discuss leaving that lead in place. If the regulatory agencies concur that additional lead would be impractical to remove then it will be left in place to be encapsulated within the concrete monolith. The EE/CA demonstrated that leaving additional lead in the monolith does not increase the long-term risk via the groundwater pathway.</td>
</tr>
<tr>
<td>CAB 5.</td>
<td>Alternative 2 discusses grouting of the interior of the vessels. If this alternative is selected, then further research should be performed to ensure that the vessels can be grouted. For example, the columns in the G and H cell have sieves plates and the columns in P and Q cells have raschig rings within which could hinder the addition of grout to these vessels. The CAB recommends filling these from the bottom, which may allow for the flow of the grout to fill all of the cavities within these vessels.</td>
<td>This recommendation will be forwarded to the engineering team developing the grouting plan necessary to create the monolith.</td>
</tr>
<tr>
<td>Comment No.</td>
<td>Comment/Issue</td>
<td>Response</td>
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<tr>
<td>CAB 6.</td>
<td>The CAB additionally recommends a thorough visual inspection and radiological survey be made of the cells that workers will be entering to ensure they will not be exposed to high radiation fields and as well as working conditions, such as their limited mobility, as they try to remove sections of the vessels. It is also recommended that the workers performing the work have knowledge of the area and the limits they may have to go through to complete the jobs assigned. In this regard, training mockups would serve to enhance work procedures, which should reduce the time that personnel are exposed to any potential radiation fields or other potential work hazards.</td>
<td>As part of the decontamination and decommissioning (D&amp;D) planning process comprehensive radiological survey maps and visual inspections are being made of all of the cells that workers will be entering. Mockups of unique and/or challenging work conditions are a valuable method to reduce worker exposure and risk. The use of mockups often results in significantly less time and effort spent in difficult conditions. Oftentimes the use of mockups eliminates rework that would be necessary without them. A good example for the use of mockups being considered for use will be the grouting of the vessels described in comment 5. The time spent in the processing is expected to be significantly reduced by perfecting the grouting process outside the radioactive environment. An effective “as low as reasonably achievable” (ALARA) process will be implemented in the execution of any work consistent with DOE’s regulations in 10 CFR 835, “Occupational Radiation Protection.” Alternative or innovative approaches to work will be investigated so that the overall risk and dose to workers is reduced to the extent practical. The approach will include the consideration, planning, and implementation of both reasonable physical design features (including engineering controls) and administrative controls before workers don personal protective equipment and respiratory protection. By conducting an effective ALARA process, worker risk of occupational radiation exposure is balanced against the benefits arising out of the authorized activity. Lessons learned are considered in planning and executing subsequent activities to further strengthen the ALARA process and to provide optimal employee protection.</td>
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<tbody>
<tr>
<td>CAB 7</td>
<td>After grouting, the CAB recommends the cap include a compact clay liner (or best technology available) to help prevent water infiltration.</td>
<td>The earthen cover is not expected to be designed until the final end states have been determined for INTEC buildings that are still operational in the vicinity of CPP-601/640. That is not expected until approximately 2035. Therefore, this recommendation will be included as a recommendation to be evaluated at that time. This recommendation is included section 4.3 of the Action Memorandum.</td>
</tr>
<tr>
<td>Shoshone Bannock Tribes 1</td>
<td>The Shoshone-Bannock Tribes would like to thank DOE-ID and the Idaho Cleanup Project for allowing us to comment on the Engineering Evaluation and Cost Analysis for the Decommissioning of the CPP-601 and 640 Fuel Processing Facilities. The following comments include Shoshone-Bannock Air Quality and the Tribal DOE Environmental Program as well as the Heritage Tribal Office (HeTO). Again we want to reiterate that in regards to “cleanup” at the INL it has always been the sentiment of Tribes that we strongly feel to fully ensure the safety of the environment and the aquifer that all of the legacy waste and contamination be removed. We also take in consideration the safety of the workers and others if they would attempt this monumental task. In review of the document we have some questions, comments, and recommendations with the alternative 2 that DOE has currently decided upon.</td>
<td>Thank you for your review, questions, comments, and recommendations.</td>
</tr>
<tr>
<td>Shoshone Bannock Tribes 2</td>
<td>On the proposed alternative that DOE has selected we share some concerns with the alternative 2 proposal. There will be exposure to workers as they remove the vessels in P, Q, and R cells. Once the vessels may have been cut additional or higher exposure of “radiation shine” may be encountered from within the vessels. The area is cramped and the concerns we have is the safety of the workers as they perform their duties within the congested elevated cells.</td>
<td>Comments received have triggered a re-evaluation of the risk vs. benefit for removing that part of the P, Q, &amp; R cells that extends above the PM Deck and totally removing the Mechanical Handling Cave (MHC) down to the HM Deck. This re-evaluation determined that removing the P, Q, and R cells would result in very little long-term risk reduction, but would increase both the industrial and radiological risk to workers in order to remove the elevated vessels and piping within those areas, especially the P cell which is considered a highly radiologically contaminated work area. Similar issues are raised in removing the MHC to be level with the HM Deck. Based upon this re-evaluation it has been determined that the tops of P, Q, and R cells and the lower portion of the MHC will not be removed. The selected remedy has been modified accordingly to incorporate the comment received from the Citizen’s Advisory Board.</td>
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<tr>
<td>Shoshone Bannock Tribes 3.</td>
<td>As for the asbestos that is in the various areas the Tribe questions why should it be removed if those areas will also be grouted in place. We would recommend that the asbestos be left in place and grouted as well.</td>
<td>Most of the asbestos in CPP-601/640 is found in areas typically occupied by operators, i.e., relatively low dose areas. Most of the asbestos is at locations easily accessible to the worker and does not require working at heights or in areas with significant radiological contamination. If asbestos is found in work locations that pose an increase to worker risk due to higher radiological dose or industrial safety hazards removal will be reconsidered and discussed with the regulatory agencies.</td>
</tr>
<tr>
<td>Shoshone Bannock Tribes 4.</td>
<td>The Tribes feels that the removal of lead from the various areas in 601 and 640 may have an additional radiological impact on the workers who are removing the lead. Previously lead had been placed in the various areas to reduce the exposure of high radiation to workers. There is a concern for the workers as they handle the lead, some of the lead may have high radiation levels of fixed contamination in-bedded that would create additional exposure to the hands. The Tribe feels and recommends that the lead that has been previously placed in areas to reduce high radiation exposure be left in place and grouted where they lay.</td>
<td>As noted in the EE/CA there are two areas within CPP-601/640 where lead is inaccessible and expected to be impractical to remove. As work progresses, other areas may be identified where it is impractical to remove lead. If additional areas are identified where there is a significant increase in worker risk to remove due to radiological conditions and industrial hazards and there is a lack of benefit (i.e., no decrease in risk to human health and the environment), the regulatory agencies will be contacted to discuss leaving that lead in place. If the regulatory agencies concur that additional lead would be impractical to remove then it will be left in place to be encapsulated within the concrete monolith. The EE/CA demonstrated that leaving additional lead in the monolith does not increase the long-term risk via the groundwater pathway.</td>
</tr>
<tr>
<td>Shoshone Bannock Tribes 5.</td>
<td>Alternative 2 discusses grouting of the interior of the vessels. If that is determined then further research should be performed to ensure that the vessels can be grouted. For example the columns in the G and H cell have sieves plates and the Columns in P, Q cells have “raschig” rings within and would hinder the addition of grout to these vessels. A majority of the vessels are not empty but have internal design that may not accept grouting from the top as planned. It would be the recommendation of the Tribe to fill from the bottom which may allow for the flow of grout to fill all of the cavities within these vessels.</td>
<td>This recommendation will be forwarded to the engineering team developing the grouting plan necessary to create the monolith.</td>
</tr>
<tr>
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<td>Shoshone Bannock Tribes 6.</td>
<td>It is also the recommendation of the Tribes that a complete and thorough inspection and review of the cells that workers who will be entering is performed to ensure workers will not be exposed to high radiation fields. This inspection will identify working conditions such as limited mobility as they try to remove sections of the vessels. It will also be recommendation that the workers that are to perform the jobs have knowledge of the area and they understand the physical and mental limits that they will go through to complete the tasks assigned.</td>
<td>As part of the D&amp;D planning process comprehensive radiological survey maps and visual inspections are being made of all of the cells that workers will be entering. Mockups of unique or challenging work conditions are a valuable method to reduce worker exposure and risk. The use of mockups often results in significantly less time and effort spent in difficult conditions. Oftentimes, the use of mockups eliminates rework that would be necessary without them. A good example for the use of mockups being considered for use will be the grouting of the vessels described in comment 5. The time spent in the processing is expected to be significantly reduced by perfecting the grouting process outside the radioactive environment.</td>
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<td>Shoshone Bannock Tribes 7.</td>
<td>Further as for “cleanup” the Tribes feel that areas determined to be cleaned up are not being cleaned up but removed to other locations on site or left in place and grouted. It seems that this has been determined to be the method of “cleanup” for the INL.</td>
<td>Cleanup in this CERCLA context does not necessarily mean contamination removal, but rather is typically a more general term for doing what is necessary to obtain acceptable levels of risk, not necessarily pristine conditions. Options typically range from no action through removal or treatment. Sometimes, as is the case for CPP-601/640, cleanup criteria can be met by containing the waste in-place and monitoring to ensure the compliance with the remedial action objectives are maintained.</td>
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<td>Shoshone Bannock Tribes 8.</td>
<td>As for grouting the Tribes question the integrity of the grout as it is exposed to high levels of radiation over a long time period. We would like to see information and statistics on where this has been applied and the results of long term grouting.</td>
<td>Grouting of radioactively contaminated facilities to provide an interim stabilized facility to allow time for the primary radionuclides to decay is an accepted practice within the DOE and commercial nuclear industry. The risk and dose assessments presented in the EE/CA demonstrating acceptable risk were prepared without taking into account the added protection that the grout offered. During the operations of the CPP-601/640 facilities, the grout (concrete) surrounding the process cells was exposed to significantly higher radiation levels than those that remain today. There is no visible damage to the interior concrete structure from that exposure that occurred over 40 years of operations. The radiation fields that remain today are far less and will continue to decrease as the predominant radionuclides have relatively short half lives, i.e., Cs-137 and Sr-90. The</td>
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<td>Shoshone Bannock Tribes 9.</td>
<td>I would first like to thank the Department of Energy and CWI for considering our comments on this issue. Last fall, I had the opportunity to tour the on-going decommissioning of CPP 601. This was beneficial as I gained a greater appreciation of the complexity and size of the tasks involved. Hopefully, such on-site involvement can be continued and even expanded for Tribal staff. After reviewing the EE/CA document, I concur with the preferred alternative with a couple of reservations, which are; Flow-ability and the longevity of the grouting material. Institutional controls to prevent inadvertent intrusion beyond 2095. These are two recurring subjects that seem to have little to no detailed discussion in many of the public documents surrounding the decommissioning of facilities on the INL.</td>
<td>Thank you for the review. See the specific comment responses below.</td>
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As it pertains to CPP 601/640, as I'm sure you're aware, there are many small void spaces in piping, vessels, and even within the vessels themselves, which would be difficult if not impossible to completely fill with grout. The concern is that if these spaces are many, the porosity of the entire structure, with the addition of cracking introduced over time possibly exacerbated by the void spaces, may allow water to filter through thus contaminating a larger area. Or, that the void spaces, such as vessels, are large enough in themselves to present a hazard if opened to the ground or air. I think it is important to discuss the type of grout material to be used, its flow characteristics, and the longevity of the material. For example, what effect if any, would the anticipated number and size of the void spaces have on the long term containment of contamination, especially since some vessels and piping will not be grouted. It seems relevant since future intrusion scenarios (well drilling) are discussed.

There are two primary reasons to fill the facility with grout. The first is to prevent subsidence. Eliminating any substantial void spaces will preclude any substantial settling. The second is to increase the structural integrity of the concrete monolith so as to extend the long-term effectiveness of the structure in reducing precipitation infiltration from moving through the residual contamination, so as to increase contaminant migration. The existing structure of the building typically has reinforced concrete walls approximately 4 ft. thick. Grouting of the piping and vessels internal to the structure as well as cell voids will increase the overall length of time that the structure remains protective. Routine monitoring and maintenance of the concrete exterior of the monolith until the earthen cap is applied will help prevent deterioration. The earthen cap to be applied, in approximately 2035, will greatly add to the longevity of the concrete monolith and further delay any migration of the remaining predominantly short-lived radionuclide contamination away from the monolith. The small void spaces that may remain within the smaller piping after grouting will not have a significant impact on migration of contaminants. The piping and vessels are comprised primarily of stainless steel which would be expected to last longer than the concrete. The risk and dose assessments demonstrated acceptable risk even without the additional protection afforded by grouting the void spaces or even the concrete building structure itself. Monitoring and maintenance of the concrete monolith followed by placing the earthen cover over the monolith will be sufficient to significantly reduce the potential for precipitation to infiltrate the building thereby reducing the potential for contaminant migration and further reducing the subsequent risk. The EE/CA evaluated an inadvertent well driller scenario in the year 2095. That evaluation determined that there was not unacceptable to the inadvertent well driller. However, due to its proximity to the TFF, this area is expected to remain under institutional controls for several hundred years.
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<td>Shoshone Bannock Tribes</td>
<td>This leads to the second issue of concern of how these decommissioned facilities will be safeguarded from human intrusion into the future. The discussed well drilling scenario is only one of many possible avenues for intrusion and therefore the exposure to contamination would vary dependent upon the intrusion. It seems the best safeguard is to impart knowledge of the dangers present to prevent future intrusions well beyond 2095. The difficulty to identify such a means does not seem an insurmountable task.</td>
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<td>Providing the information as to the hazards that remain to future generations is part of the approach necessary to implementing the EPA Region 10 Final Policy on the Use of Institutional Controls at Federal Facilities. The passing on of the knowledge of potential danger for areas such as the CPP-601/640 monolith and earthen mound will be key in preventing inadvertent intruders. The CPP-601/640 facilities lie within the OU 3-14 industrial use area where access is expected to be controlled for several hundred years with governmental institutional controls. Beyond that date other methods to preclude inadvertent intrusion are expected to be deployed such as deed restrictions and markers.</td>
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<td>Shoshone Bannock Tribes</td>
<td>The Heritage Tribal Office (HeTO) thanks the Department of Energy for the opportunity to comment on the Engineering Evaluation/Cost Analysis (EE/CA) for the Decommissioning of the CPP-601/640 Fuel Reprocessing Facilities. K. Hernandez presentation to the Fort Hall Business Council informed tribal leaders of the three alternatives presented in the EE/CA are and how each will address the decommissioning of buildings 601 and 640 and treatment of radioactive contamination in these buildings. HeTO is concerned with the length of time radioactive isotopes survive, the potential threat to the Snake River Aquifer and the functionality of the proposed grout. The grout will function as a barrier and assist in the containment of radioactive waste within the infrastructure of the buildings. The grout is undeveloped and there has a probability of not being functional and performing to expected standards.</td>
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<td>The long-term (200-300 years) performance of modern day grout is reasonably well known. Grout (i.e., concretes) have been in use since the Roman Empire, and when maintained and protected from the environment will last a very long time. The grout now being evaluated for use in CPP-601/640 is the same grout approved for use in stabilizing the waste in the Tank Farm Facility. The grout to be used in CPP-601/640 will add structural strength to the existing concrete monolithic structure and reduce the potential for infiltration of precipitation through the monolith to the soils below. The combination of the monolithic structure, the soil cover, and the institutional controls provide the protection necessary to minimize the migration to the aquifer allowing time for the predominantly short lived radionuclides to radioactively decay. The risk and dose assessments demonstrated acceptable levels of risk even without any of these controls which provide additional levels of protection.</td>
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<td>Shoshone Bannock Tribes 13.</td>
<td>The Snake River Aquifer is situated approximately 350 feet below the INL. As such, risk from radioactive waste contamination is a threat. The Shoshone Bannock Tribes are concerned for the cultural properties located INL. The water is sacred and gives life. A spiritual use includes medicinal. Other cultural properties include the soil, vegetation, and water from precipitation. Migration of radioactive waste is a risk although this project will be monitored to maintain expectable work risk to the environment is a reality and loss of cultural properties. Idaho National Laboratory is situated on the aboriginal lands of the Shoshone and Bannock peoples. This area is significant for hunting gathering and is a corridor to the Plains and Salmon River area. The archaeological record indicates this area has been used for the 4,000 years tribal oral history state this area has been has been used since the beginning of time. The Shoshone Bannock Tribes cultural footprint is evident on the landscape (rock art, hunting blinds, buttes), ethnographic record and in the archaeological record. Cultural property for Shoshone and Bannock people includes elements in the physical and spiritual environments. HeTO recommends Tribal involvement in monitoring of the concrete monolith. Independent monitoring of soil and ground and surface water surrounding CPP-601/640 for migration of radioactive materials conduct by tribal DOE.</td>
<td>DOE recognizes that the Shoshone-Bannock Tribes (the Tribes) are concerned that INL is within the aboriginal land area of the Tribes and that historically the land and waters within and surrounding INL were used for fishing, hunting, plant gathering, medicinal, religious, ceremonial, and other cultural uses before the Shoshone-Bannock Reservation (the Reservation) was established. DOE also recognizes there is a distinctive obligation of trust incumbent upon the government in its dealings with the Tribes. The scope of the trust is defined by the specific duties and obligations contained in treaties, agreements, executive orders, or statutes. However, DOE cannot afford the Tribes more rights than the DOE has under the law and implementing regulations. Unless there is a specific duty that has been placed on DOE with respect to the Tribes, DOE’s trust obligations are discharged by its compliance with general regulations and statutes not specifically aimed at protecting the Tribes. As a mutually agreeable vehicle to discharge our statutory responsibilities and implement applicable federal policies, DOE has entered into the Agreement-in-Principle Between the Shoshone-Bannock Tribes and the United States Department of Energy with the Tribes to define their working relationship and recognize DOE’s trust responsibility. DOE and its contractors have worked and will continue to work with the Tribes to provide input to INL planning and access to the INL as necessary or required by the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), the National Environmental Policy Act (NEPA), the Native American Graves Protections and Repatriation Act (NAGPRA), and the American Indian Religious Freedom Act (AIRFA), and any other applicable laws and agreements. While DOE recognizes that the Tribes retained the right under the Fort Bridger Treaty to hunt on “unoccupied” lands, the property encompassing this project is not expected to ever become “unoccupied” such that hunting would arise consistent with the use of the property. As long as the property is fenced and has other indications of occupancy, it...</td>
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<td>Shoshone Bannock Tribes</td>
<td>14. HeTO recommends Continue tribal consultation in regards to the evaluation and design of the earthen cover at CPP-601/640 and monitoring activities.</td>
<td>The earthen cover is not expected to be designed until the final end states have been determined for INTEC buildings that are still operational in the vicinity of CPP-601/640. That is not expected until approximately 2035. It is expected that future decision documents will be presented to the Shoshone Bannock Tribes in a manner similar to this EE/CA.</td>
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<td>Anonymous Public Comment</td>
<td>1 This EE/CA has identified only three alternatives available for decommissioning these facilities. Alternatives one and two provide a significant amount of relief to the closure contractor in terms of required actions that must be performed to ready these facilities for decommissioning. However, as this document states, “The process to accomplish this decommissioning and to determine the final end state for CPP-601/640 is to perform a non-time-critical removal action (NTCRA) under 42 United States Code (USC) § 9601 et seq., ‘Comprehensive Environmental Response, Compensation and Liability Act of 1980,’ (CERCLA).” Under these terms, all options should be available for review by the public and State of Idaho to ensure an acceptable disposition path for this facility is determined. A NTCRA determination should not be based purely on providing economic relief to the closure contractor and the Department of Energy, Idaho Operations (DOE-ID), but the most acceptable disposition path should ultimately be based on the desired end state of this facility by the public and State of Idaho. Therefore, the three alternatives identified in this plan are not acceptable to the residents of Idaho for the disposition and decommissioning of the identified facilities.</td>
<td>Thank you for your comments. The process used to develop the EE/CA considered a full range of possible alternatives from no action to complete building removal. The three alternatives selected for more intensive evaluation and presentation in the EE/CA were selected in order to represent a reasonable range of alternatives that would help differentiate the differences in the CERCLA decision making criteria. Those criteria included: overall protection of human health and the environment; compliance with ARARs; long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness including worker protection; implementability; cost; and state/support agency acceptance. The final criteria for evaluation is community acceptance and is evaluated based upon the comments received during the public comment period. Overall the comments received during the public comment period were supportive of the alternative recommended in the EE/CA. The recommended alternative was selected based on greater implementability; greater short-term effectiveness, including lower worker risk; and lower cost with equivalent overall protection of</td>
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<td>Anonymous Public Comment 2</td>
<td>A critical alternative not identified is to quantify all nuclear material and physically remove the nuclear material from all piping located within the facility. Overall project costs to effectively quantify and remove all nuclear material from this facility may seem severe at first but, when implemented over a longer period of time, these costs can be included as part of the overall closure activities of the Idaho National Laboratory (INL) reducing the annual Fiscal Year appropriations required to complete this project. It is my recommendation that a complete mechanical physical disassembly of all piping, vessels, transfer lines, off-gas lines, filters, waste lines be implemented. These items should be inspected and measured to provide quantified values for the amount of nuclear physically resident within the facility. This approach has been successfully implemented at other Department of Energy (DOE) Facilities within the DOE Complex, including Oak Ridge, Savannah River, Hanford, and Rocky Flats. Thousands of samples were taken at these facilities to quantify the mass of material located in their processes prior to removal and disposal at approved waste repositories.</td>
<td>The waste characterization method used to determine the radioactive material inventory for the EE/CA resulted in more than double the activity than the component-by-component method. This approach for this EE/CA provides a conservative bounding inventory for risk and dose assessment purposes. Nine process cells exhibiting the highest radiation and contamination levels, which collectively contribute nearly two-thirds of the entire CPP-601 radioactive material inventory, were analyzed using both a traditional “component-by-component” characterization method and the “dose-to-Curie” modeling method used for the radiological characterization portion of the EE/CA. The dose-to-Curie method clearly provided more conservative results. The risk assessment in the EE/CA demonstrates that even with the conservative bounding inventory calculation, the preferred alternative is protective of human health and the environment. CERCLA does not require removal of all contaminated material, it is a risk based process that allows materials to be left in place if the risk is acceptable and controls are maintained. Each situation needs to be evaluated in terms of the CERCLA criteria including any potential...</td>
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<td>Anonymous Public Comment</td>
<td>This EE/CA document identifies the successful removal of nuclear material from the CPP 640 Graphite Fuel Headend and the grouting of vessels within that cell. The success of this project was based on an intensive effort to physically disassemble process lines, transfer pots, and vessels and mechanically recover the contained nuclear material. Samples of the recovered material were obtained and destructive analysis performed determining isotopic concentrations, quantifying the amount of material located within the facility. Residual material not amenable to removal was estimated based on inspection to determine the depth of the remaining layer of nuclear material and applied to the areas of the vessels and glove box. Residual material on the process cell walls was estimated based on the same method. The basic concepts for this success were: physical separation of components, extensive efforts for complete nuclear material removal, mechanical inspection, measurement, and technical validity of estimates for residuals.</td>
<td>The same primary personnel who successfully carried out that partial CPP-640 cleanup are intimately involved in developing and evaluating the inventory and the alternatives in this EE/CA. The previous CPP-640 approach was based on the physical attributes of that part of the system that did not allow for normal decontamination and cleanout approaches. The dismantling of that part of the CPP-640 system was dictated by need to access specific areas in order to remove the material from those lines. That is not the case with respect to the remaining lines in CPP-601/640. The remaining areas in CPP-601/640 can be successfully flushed to remove any contamination that is found to be in excess of that evaluated by the EE/CA.</td>
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<td>Anonymous Public Comment</td>
<td>Unfortunately, this level of effort is not contained in this EE/CA for the remaining cells in CPP 640 nor CPP 601. EDF-8293, “Radioactive Material Inventory for the CPP-601/640 Fuel Reprocessing Complex Engineering Evaluation/Cost Analysis” is a single source term document is being used as the basis for determine nuclear material quantities within the facility. A single source term is not capable of determining the quantity of nuclear material within this facility due to the different process headends composing this facility. These headends processed fuels from significantly different fuel matrices and fuel loadings. Therefore, a single source term cannot accurately determine nuclear material quantities physically resident within the associated piping for these headends. EDF-8293 has not been approved by the accountability organization as a basis for determining nuclear material quantities in CPP 601. A single source term is extremely imprecise. It will either conservatively over-estimate the quantity of nuclear material</td>
<td>The CPP-601/640 radiological characterization (EDF-8293) using the dose to cure model (single source term) has been confirmed to provide a conservative bounding estimate of residual radioactive materials remaining in the systems and structure of the buildings. This is primarily attributable to the fact that all of the concentrated wastes (that would have been representative of a single fuel type) have been flushed out of the building and that the contamination remaining is primarily the type of minor residual contamination that builds up over time (e.g., accumulations of small amounts of waste from multiple sources over time). Three exceptions were identified where the single source term approach was not applicable. These outliers were identified as the abandoned lines originating in N-cell, N-cell Raschig rings, and the MLLW tank system. The first two are N-cell product related systems not waste systems. Under the terms of this</td>
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<td>physically resident or under-estimate the quantity. The State of Idaho and residents within the State need to know exactly the quantity of nuclear material within this facility to make a reasoned determination for the facility’s disposition and long-term end state. The credibility of this EE/CA is further tarnished by the fact that the quantity of nuclear material purported to be resident within the facility has been exceeded by estimates of material already discovered in N Cell, one of twenty five process cells in CPP 601 alone. Without total physical disassembly inspection and mechanical removal of all nuclear material from all piping, vessels, vent lines, and offgas systems will this facility’s nuclear material inventory be determined allowing for correct disposition of the facility and nuclear material contents.</td>
<td>EE/CA, these systems are being further characterized. If new data indicates that the existing source term is no longer bounding or protective of human health and the environment product material from these systems will reduced as necessary. The third system is a MLLW tank system that is still active and being used to collect rinsates from ongoing decontamination efforts. The decontamination solutions will be transferred to an active treatment process in another building not addressed within the scope of this EE/CA. As part of the closure of that MLLW tank system, the remaining material in the tanks will be characterized to confirm that the existing inventories are bounding. If that characterization indicates that the existing characterization is no longer bounding, the residual material in that tank system will be reduced as necessary. This approach ensures that the inventory evaluated in the EE/CA remains bounding and ensures protectiveness of human health and the environment. The EE/CA’s identification of these additional requirements for further evaluation for these three systems mitigates the commenter’s concern about the credibility of the EE/CA. Indeed the identification of these potential issues in the uncertainty analysis is further validation of the thoroughness of the preparation of the radioactive inventory rather than a detraction of its credibility. The potential increase noted by the commenter in N cell is related to the fact that N cell was the main cell for product storage and as such contained very high concentrations of the product isotope. As such, any change in that cell’s inventory could have a relatively large impact specific to the inventory of that particular isotope, but will have an almost negligible impact to the other more predominant radionuclides, which dominate the inventories in the other process cells as well as overall building inventory.</td>
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<td>Anonymous Public Comment 5</td>
<td>Sections 2.6, “Removal of Radionuclides and other Considerations” and Section 2.7, “Extent of Contamination and Remaining Inventories” identifies historical processes used to “sweep down” the process lines and determine nuclear material quantities within those vessels. A retired process engineer who reviewed these efforts indicated that the direction of those efforts seemed to be more not to find nuclear material rather than to remove nuclear material.</td>
<td>The primary purpose of CPP-601/640 was to extract and recover nuclear materials. As such, the process was initially designed to allow for minimal hold up of nuclear materials and to facilitate material recovery. Following each process campaign, extensive efforts were taken to remove nuclear materials. In addition, following each process campaign, sweep downs were necessary to reduce worker exposure during hands-on maintenance and to maintain accountability of uranium. Flushes of the system were repeated until it was demonstrated to be successful based upon a lack of additional nuclear material being removed. In the late 1980’s the facility was shut down for a major upgrade. An especially thorough decontamination campaign was conducted to facilitate the hands-on work involved. Near the end of this upgrade, DOE made the decision to cease the reprocessing of spent nuclear fuel. As the D&amp;D process proceeds additional decontamination efforts will be made as necessary to provide safe working conditions or to reduce contamination levels. The success of these decontamination efforts has been further validated on numerous occasions. As the facility has been prepared for D&amp;D, samples of piping were removed for analysis and the data confirmed that the piping contained only minimal contamination that remained within a fixed microscopic oxidation layer on the inside of the stainless steel piping.</td>
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<td>Anonymous Public Comment 6</td>
<td>This EE/CA has identified that multiple fuel types were processed in these facilities including foreign fuels, domestic reactor fuels from both DOE and Nuclear Regulatory Commission (NRC) facilities, and fuels from the Navy. No information is provided within this document to address the issue, if the three identified alternatives are selected, how will residual naval materials processed and left within the facility be controlled based on classification concerns? Security should remain at the facility to ensure access to these materials is restricted. Grouting the facility does not alter the characteristics of nuclear material. Grout can be easily rinsed away for removal providing access the items containing nuclear material. If this were</td>
<td>The source term of radionuclides and the relative abundance among them was determined primarily from extensive empirical sampling and laboratory analysis of materials from CPP-601/640. The analytical results confirmed that the original pedigree of radionuclides from the pure head-end, product and raffinate streams has been commingled and effectively normalized as a result of the multiple sweep downs, flushes and chemical decontaminations performed when the fuel reprocessing mission was terminated. The pure process solutions related to any specific fuel type are no longer present in the process systems; what remains is the</td>
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<td>Anonymous Public Comment 7.</td>
<td>The proposed budget for fiscal year 2009 indicates a reduction in funding for the Environmental Program at the INL of approximately $76 million dollars. Reduced funding levels will increase the pressure to limit the scope of cleanup activities based on economics rather than selecting the appropriate end state for facilities in Idaho determined by the public and State of Idaho. A truly NTCRA management approach will allow a phased and effective decommissioning of facilities at the INL.</td>
<td>The preferred alternative was selected based on the criteria defined by EPA for NTCRAs in “Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA” EPA/540-R-93-057. The preferred alternative is not based on funding profiles, but on ensuring protectiveness of human health and the environment. The alternatives do not dictate a schedule and as such are not driven by funding profiles.</td>
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