transuranic waste/SBW. The EIS also presents the impacts for a grout facility (see Project P2001 in Appendix C.6) that could be used to treat the waste generated after 2005. For purposes of assessing transportation impacts, DOE assumed the grouted waste would be characterized as remote-handled transuranic waste and transported to the Waste Isolation Pilot Plant for disposal (see Appendix C.5).

3.2 Facility Disposition Alternatives

The waste processing alternatives described in Section 3.1 do not include any specific facility disposition ***alternatives*** except for those cases where facility disposition is an integral part of implementation of the option (e.g., disposal of low-level waste Class A or Class C type grout in the Tank Farm and bin sets). However, DOE intends to make decisions regarding disposition of HLW facilities (including existing facilities and facilities that would be constructed under the waste processing alternatives).

The facility disposition analysis considers disposition of currently existing HLW facilities and HLW facilities that would be constructed under the waste processing alternatives. Because most INEEL HLW facilities contain RCRA wastes, the facility disposition alternatives analyzed in this EIS are consistent with RCRA closure requirements. Section 5.3 describes the impacts to the environment of facility disposition alternatives.

Existing HLW facilities would be dispositioned under all waste processing alternatives. The facility disposition alternatives are modular in nature and can be integrated with any waste processing alternative or option. However, each waste processing alternative would result in the construction (and the need for ultimate disposition) of a different number of facilities (as described in the following section). Table 3-***1*** identifies the major facilities that would be constructed for each waste processing alternative.

Facility Disposition

*Facility disposition would include activities performed under multiple regulatory programs to address INTEC facilities that no longer **had** a mission and **required placement** in a condition consistent with land use decisions and end-state planning for the INEEL. Some of the activities that would be encompassed by the facility disposition alternatives include:*

Closure – Removal, decontamination, or encapsulation of hazardous and radiological contaminants from regulated facilities in accordance with applicable regulatory requirements.

Deactivation – Removal of potentially hazardous (non-waste) materials from the process vessels and transport systems, de-energizing power supplies, disconnecting or reloading utilities, and other actions to place the facility in an interim state that requires minimal surveillance and maintenance.

Decommissioning – Decontamination of facilities that have been deactivated. This may include demolition of the facility and removal of the rubble from the site or entombment by means such as collapsing the aboveground portions of the structure into its below-grade levels and capping the contaminated rubble in place or constructing containment structures around the facility.

The facility disposition activities are intended to reach an end state where the contamination has been removed, contained, or reduced such that the level of risk associated with the residual contamination is no longer considered a threat to human health or the environment. At that time, DOE could either reuse the facilities for new missions or transfer control of the facilities to others.

3.2.1 DESCRIPTION OF FACILITY DISPOSITION ALTERNATIVES

RCRA closure regulations require removal or decontamination of all hazardous waste residues and contaminated containment system components, equipment, structures, and soils during closure. The "remove or decontaminate" standard can be achieved by reducing the amount of residual contamination to levels that are (1) below detection or indistinguishable from background concentrations or (2) at concentrations below levels that may pose an unacceptable risk to human health and the environment. The U.S. Environmental Protection Agency expects that well-designed and well-operated RCRA units (i.e., units that comply with the unit-specific minimum technical requirements) will generally be able to achieve this standard (EPA 1998).

However, based on technological, economic, and worker health risks involved, it may not be practical to remove all of the residual material from the INTEC facilities, decontaminate all equipment, and remove all surrounding contaminated soils to achieve clean closure. The RCRA regulations (40 CFR 264.197) state that if all contaminated system components, structures, and equipment cannot be adequately decontaminated, then the facilities must be closed in accordance with the closure and post-closure requirements that apply to landfills ("closed to landfill standards"). Therefore, DOE is evaluating six potential facility disposition alternatives in this EIS: (1) No Action, (2) Clean Closure, (3) Performance-Based Closure, (4) Closure to Landfill Standards, (5) Performance-Based Closure with Class A Grout Disposal, and (6) Performance-Based Closure with Class C Grout Disposal. Each of these facility disposition alternatives is briefly described below. For all closures, detailed closure plans would be developed and approved to ensure closures are performed in accordance with approved procedures and that risk to workers and the public are minimized and acceptable.

No Action – Under the No Action Alternative, DOE would not plan for disposition of its HLW facilities at INTEC. Nevertheless, over the period of analysis ***through*** 2035, many of the facilities identified in Table 3-***3*** could be deactivated. This means that bulk chemicals would be removed and the facility could be de-energized. Surveillance and maintenance necessary to protect the environment and the safety and health of workers would be performed in the normal course of INTEC operation. Therefore, the No Action Alternative for facility disposition is substantially the same as No Action for waste processing. As a result, Section 5.3 does not present environmental consequences for the facility disposition No Action Alternative ***through*** 2035. Future facility closures and/or dispositions which are not foreseen at this time would be covered in future National Environmental Policy Act reviews, as appropriate.

The one difference between the facility disposition and the waste processing No Action Alternatives is the long-term condition of the bin sets and Tank Farm. The calcine in the bin sets and the mixed transuranic waste/SBW in the Tank Farm would have to remain in those facilities because that is the assumption underlying the No-Action Alternative. Over the period of analysis through 2035, continued storage in these two facilities would result in no activities different from those in the waste processing No Action Alternative. However, over the thousands of years beyond 2035, the materials in these facilities would migrate into the environment. To capture these long-term impacts, DOE analyzed the continued storage of calcine and mixed transuranic waste/SBW. The analysis is presented in Appendix C.9, Facility Closure Modeling. The results of the analysis are reported in the water, human health, and ecology subsections of Section 5.3.

Clean Closure – ***Under the Clean Closure Alternative,*** facilities would have the hazardous wastes and radiological contaminants, including contaminated equipment, removed from the site or treated so the hazardous and radiological contaminants are indistinguishable from background concentrations. Clean Closure may require total dismantlement and removal of facilities. This may include removal of all buildings, vaults, tanks, transfer piping, and contaminated soil. This alternative would require a large quantity of soil for backfilling and would also require topsoil for revegetation. Use of the facilities (or the facility sites) after Clean Closure would present no risk to workers or the public from hazardous or radiological components.

Table 3-3. Facility disposition alternatives *analyzed in this EIS*.

Facility Description	Clean Closure	Performance-Based Closure	Closure to Landfill Standards	Performance-Based Closure with Class A Grout Disposal	Performance-Based Closure with Class C Grout Disposal
		Performance-Based Closure Methods			
Tank Farm and Related Facilities					
Tank Farm[a]	●	●	●	●	●
CPP-619 – Tank Farm Area – CPP (Waste Storage Control House)			●		
CPP-628 - Tank Farm Area – CPP (Waste Storage Control House)			●		
CPP-638 – Waste Station (WM-180) Tank Transfer Building			●		
CPP-712 – Instrument House (VES-WM-180, 181)			●		
CPP-717 – STR/SIR Waste Storage Tank Pads (A, B, C, and D) and Vessels			●		
Bin Sets and Related Facilities					
Bin sets[b]	●	●	●	●	●
CPP-639 – Blower Building/Bin Sets 1, 2, 3			●		
CPP-646 – Instrument Building for 2 nd Set Calcined Solids			●		
CPP-647 – Instrument Building for 3 rd Set Calcined Solids			●		
CPP-658 – Instrument Building for 4 th Set Calcined Solids			●		
CPP-671 – Instrument Building for 5 th Set Calcined Solids			●		
CPP-673 – Instrument Building for 6 th Set Calcined Solids			●		
Process Equipment Waste Evaporator and Related Facilities					
CPP-604 – Process Equipment Waste Evaporator			●		
CPP-605 – Blower Building			●		
CPP-641 – West Side Waste Holdup	●				
CPP-649 – Atmospheric Protection Building			●		
CPP-708 – Exhaust Stack/Main Stack [c]			●		
CPP-756 – Pre-Filter Vault			●		
CPP-1618 – Liquid Effluent Treatment and Disposal Facility	●				
NA – PEWE Condensate Lines			●		
NA – PEWE Condensate Lines and Cell Floor Drain Lines			●		
Fuel Processing Building and Related Facilities					
CPP-601 – Fuel Processing Building		●	●		
CPP-627 – Remote Analytical Facility Building		●	●		
CPP-640 – Head End Process Plant		●	●		
FAST and Related Facilities					
CPP-666 – Fluorinel Dissolution Process and Fuel Storage Facility		●			
CPP-767 – Fluorinel Dissolution Process and Fuel Storage Facility Stack	●				

Table 3-3. Facility disposition alternatives *analyzed in this EIS* (continued).

Facility Description	Clean Closure	Performance-Based Closure	Closure to Landfill Standards	Performance-Based Closure with Class A Grout Disposal	Performance-Based Closure with Class C Grout Disposal
		Performance-Based Closure Methods			
Transport Lines Group					
NA – Process Off-gas Lines		●			
NA – High-Level Liquid Waste (Raffinate) Lines			●		
NA – Process (Dissolver) Transport Lines		●			
NA – Calcine Solids Transport Lines			●		
Other HLW Facilities					
CPP-659 – New Waste Calcining Facility [d]		●	●		
CPP-684 – Remote Analytical Laboratory		●			

a. The INTEC Tank Farm consists of underground storage tanks, concrete tank vaults, waste transfer lines, valve boxes, valves, airlift pits, cooling equipment, and several small buildings containing instrumentation and valves for the waste tanks. Includes waste storage tanks (VES-WM-180 through 190), Tank Vaults for Tanks VES-WM-180 through 186 (CPP-780 through 786), Tank Enclosure for Tanks VES-WM-187 through 190 (CPP-713), and facilities CPP-721 through 723, CPP-737 through 743, and CPP-634 through 636, and CPP-622, 623, and 632.

b. The bin sets consist of ancillary structures, instrument rooms, filter rooms, cyclone vaults, and stacks, including CSSF-1 through 7, CPP-729, CPP-732, CPP-741 through 742, CPP-744, CPP-746 through 747, CPP-760 through 761, CPP-765, CPP-791, CPP-795, and CPP-1615.

c. Includes the instrument building for Main Stack CPP-692 and waste transfer line valve boxes.

d. Includes Organic Solvent Disposal Building CPP-694.

STR = Submarine Thermal Reactor, SIR = Submarine Intermediate Reactor

PEWE = Process Equipment Waste Evaporator.

Performance-Based Closure – ***Under the Performance-Based Closure Alternative, contamination would remain that is below the levels that would impact human health and the environment as established by regulations, and*** closure methods would be dictated on a case-by-case basis. ***These levels, commonly referred to as action levels, are either risk-based (e.g., residual contaminant levels established by requirements) or performance-based (e.g., drinking water standards). Once the performance-based levels are achieved, the unit/facility is deemed closed according to RCRA and/or DOE requirements. Other activities may then occur to the unit/facility such as decontamination and decommissioning or future operations (where non-hazardous waste can enter the unit/facility).*** Most above-grade facilities/units would be ***demolished*** and most below-grade facilities/units (tanks, vaults, and transfer piping) would be stabilized and left in place. ***The*** residual contaminants would no longer pose any unacceptable exposure (or risk) to workers, the public, ***and the environment***.

Closure to Landfill Standards – ***Under the Closure to Landfill Standards Alternative,*** the facilities would be closed in accordance with state, Federal ***and/or DOE*** requirements for closure of landfills. ***For landfill closures, wastes are removed to the extent practicable. However, quantities remaining would not meet clean closure or performance-based closure action levels. Therefore, there is a greater potential risk from a landfill closure when compared to a Performance-Based or Clean Closure. Because of this, capping and post-closure monitoring would be required to protect the health and safety of the workers and the public from releases of contaminants from the facility.*** Waste residuals within tanks, vaults, and piping would be stabilized in order to minimize the release of contaminants into the environment. Once waste residues ***were*** stabilized, protection of the environment ***would be ensured*** by installing an engineered cap, establishing a groundwater monitoring system, and providing post-closure monitoring and care of the waste containment system, depending on the type of contaminants, ***to protect the health and safety of the workers and the public from releases of contaminants from the facility/unit in accordance with the closure performance standards. The unit/facility cap requires maintenance and ground water monitoring of the landfill for 30 years (a waiver may be applied for after 5***

years). Also, a landfill closure is required to have a Corrective Action Plan that would be implemented in the event any contamination is detected beyond the boundary of the landfill. Implementing a corrective action resets the time for maintenance and monitoring for another 30 years.

Several of the waste processing options result in production of a low-level waste fraction, which would then be grouted and disposed of either in (1) a near-surface disposal facility on the INEEL, (2) the Tank Farm and bin sets, or (3) an offsite disposal facility. Disposal of this low-level waste in the Tank Farms and bin sets would occur after these facilities have been closed under the Performance-Based Closure alternative.

In order to accommodate the use of the Tank Farm and bin sets for disposal of the low-level waste fraction, this EIS also evaluates two additional facility disposition alternatives for the Tank Farm and bin sets ***as follows.***

Performance-Based Closure with Class A Grout Disposal – The facility would be closed as described above for the Performance-Based Closure alternative. Following completion of those activities, the Tank Farm or bin sets would be used to dispose of low-level waste Class A type grout produced under the Full Separations Option.

Performance-Based Closure with Class C Grout Disposal – The facility would be closed as described above for the Performance-Based Closure alternative. Following completion of those activities, the Tank Farm or bin sets would be used to dispose of low-level waste Class C type grout produced under the Transuranic Separations Option.

DOE has completed a comprehensive evaluation for the cleanup program at INTEC (known as Waste Area Group 3) under the requirements of CERCLA. Under this program (Federal Facility Agreement and Consent Order), DOE, the U.S. Environmental Protection Agency, and the State of Idaho have made decisions regarding the disposition of environmental media, such as contaminated soils and water. While this program is not the subject of this EIS, decisions regarding disposition of HLW facilities are being coordinated with decisions made ***under Waste Area Groups***. ***Waste Area Group 3*** activities also contribute to the cumulative impacts presented in Section 5.4 of this EIS. Chapter 6 provides ***additional regulatory discussion.***

3.2.2 PROCESS FOR IDENTIFYING CURRENT FACILITIES TO BE ANALYZED

DOE used a systematic process to identify which existing INTEC facilities would be analyzed in detail under the facility disposition alternatives in this EIS. The first step was to perform a complete inventory of all INTEC facilities (Wichmann 1998; Harrell 1999). Next, DOE identified which of these facilities are directly related to the HLW Program (i.e., HLW treatment, storage, or generation facilities). This EIS includes detailed analysis for all such facilities. DOE plans to consider this analysis, together with other factors such as mission, policy, technical considerations, and public comments in its final decision(s) about the disposition of these facilities.

DOE assumes that other INTEC facilities will have residual amounts of radioactive and chemical contaminants at closure, and has included the environmental impacts of these facilities in the cumulative impact analysis in this EIS. However, disposition decisions about other INTEC facilities are not within the scope of this EIS. A list of other INTEC facilities analyzed for their contributions to cumulative impacts can be found in Section 5.4.2.

For each significant HLW ***management*** facility, DOE considered which of the facility disposition alternatives would be most appropriate ***for analysis in the EIS***. The determination of the applicable disposition methods was based on the facility and residual waste characteristics. ***The EIS does not analyze all potential facility disposition alternatives for each of the HLW management facilities. However, as explained below, the alternative(s) selected for analysis are representative of the impacts that would be expected for the entire range of facility disposition alternatives. Consequently, for a specific HLW management facility, DOE may select from the full range of facility disposition alternatives (Clean Closure, Performance-Based***

Closure, or Closure to Landfill Standards) based on the analyses in this EIS. A list of the existing HLW management facilities and the corresponding facility disposition alternatives ***analyzed in the EIS*** is provided in Table 3-***3***.

For the Tank Farm and bin sets, which together constitute the great majority of the total inventory of residual radioactivity, DOE analyzed all five facility disposition alternatives. These facilities would be the main contributors to the residual risk at INTEC. The level of residual risk would vary with the different facility disposition alternatives for the Tank Farm and bin sets.

The residual amount of radioactive and/or chemical contaminants associated with other INTEC facilities is much less than that of the Tank Farm and bin sets. Consequently, the overall residual risk at INTEC would not change significantly due to the contribution from these other facilities. For purposes of analysis, DOE assumed a single facility disposition alternative for the other INTEC HLW ***management*** facilities. ***In general, DOE selected the Closure to Landfill Standards alternative for analysis because it represents the maximum impacts for facility disposition. In some cases, the contaminants associated with a facility posed very small residual risk and DOE selected the Clean Closure Alternative for analysis to maximize the potential short-term impacts associated with facility disposition activities. T***he New Waste Calcining Facility and the Fuel Processing Building and related facilities ***present slightly higher residual risk than the remainder of the other INTEC HLW management facilities. DOE evaluated a second facility disposition alternative, Performance-Based Closure, for these two facilities to determine whether the potential impacts would vary between alternatives.***

For the new HLW ***management*** facilities identified in Table 3-***1***, DOE analyzed the Clean Closure alternative. This facility disposition assumption is ***consistent with the objectives and requirements of DOE Order 430.1A, Life Cycle Management, and DOE Manual 435.1-1, Radioactive Waste Management Manual, that all newly constructed facilities necessary to implement*** the waste processing alternatives would be designed ***and constructed consistent with measures that facilitate clean closure.***

3.3 Alternatives Eliminated from Detailed Analysis

This section identifies those alternatives that have been eliminated from detailed analysis in this EIS and briefly ***discusses*** why they have been eliminated [40 CFR 1502.14(a)]. CEQ regulations direct all ***federal*** agencies to use the NEPA process to identify and assess ***the*** range of ***reasonable*** alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment [40 CFR 1500.2(e)]. The CEQ guidance further states that: (1) reasonable alternatives include those that are practical or feasible from a technical, economic, or common sense standpoint; (2) the number of reasonable alternatives considered in detail should represent the full spectrum of alternatives meeting the agency's purpose and need; and (3) the EIS need not discuss every unique alternative when a large number of reasonable alternatives exists.

This section seeks to consolidate the alternatives that serve the same general purpose by eliminating from detailed study those alternatives that present strong cost, schedule, regulatory, and technical maturity or feasibility constraints and offer no significant advantages over alternatives selected for detailed analysis. While cost alone is not normally a criterion for eliminating an alternative from detailed study, it is a powerful discriminator when coupled with the existence of similar but more cost-effective alternatives. Appendix B describes the process DOE used to identify the set of reasonable alternatives for analysis in this EIS. For the reasons discussed below, DOE has decided to eliminate the following alternatives from detailed study:

- Separations Alternative – Transuranic Separations/Class A Type Grout Option
- Non-Separations Alternative – Vitrified Waste Option
- Non-Separations Alternative – Cement-Ceramic Waste Option
- Disposal of Low-Level Waste Class A or Class C Type Grout at the Hanford Site