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Revision 6

U.S. Department of Energy
Idaho Operations Office

Acquisition Strategy for the Idaho National Laboratory Remote-Handled Low-Level Waste Disposal Project

May 2011

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Prepared for the
U.S. Department of Energy
DOE Idaho Operations Office

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Concurrence and Approvals

U.S. Department of Energy, Idaho Operations Office:

Julie Conner, Federal Project Director — 5/25/11 Date

Suzette Olson, Contracting Officer — 5/26/11 Date

R. Provencher, Manager — 6/2/2011 Date

U.S. Department of Energy, Office of Nuclear Energy:

Tracey L. Bishop, Program Manager
NE-32, Office of Facilities Management — 7/13/11 Date

Dennis Miotla, Deputy Assistant Secretary for Nuclear Facilities Operations — 7/13/11 Date

Peter B. Lyons, Assistant Secretary for Nuclear Energy, Acquisition Executive — 7/13/11 Date

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ACRONYMS

ATR	Advanced Test Reactor
CD	critical decision
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	Department of Energy
DOE-ID	DOE Idaho Operations Office
FY	fiscal year
IDAPA	Idaho Administrative Procedures Act
INL	Idaho National Laboratory
LLW	low-level waste
MFC	Materials and Fuels Complex
NE	DOE Office of Nuclear Energy
NEPA	National Environmental Policy Act
NNSS	Nevada National Security Site
NR	DOE Office of Naval Reactors
NRF	Naval Reactors Nevada Test Site
OPC	other project cost
RWMC	Radioactive Waste Management Complex
TEC	total estimated cost
TPC	total project cost

Acquisition Strategy for the Idaho National Laboratory Remote-Handled Low-Level Waste Disposal Project

SUMMARY PROJECT INFORMATION

Project Title:

Idaho National Laboratory (INL) Remote-Handled Low-Level Waste (LLW) Disposal Project

Lead Program and Project Office:

Idaho Operations Office

Total Project Cost Range:

- $68.41 to $92.18M (material change from Critical Decision [CD]-0 cost, increased range)

CD-0 Mission Need Approved:

- July 1, 2009

CD-0 Approving Official:

- R. Shane Johnson, Acting Assistant Secretary

CD-0 Material Change:

- Requirement for the capability shifted from Fiscal Year (FY) 2015 to FY 2017.
- Total project cost (TPC) range changed from $32.8 – $79.5M to$68.41 – $92.18M.

1. DESIRED OUTCOME AND MAJOR APPLICABLE CONDITIONS

This document describes the design-build acquisition strategy that will be applied to the Remote-Handled LLW Disposal Project. The design-build delivery method will be tailored, as appropriate, to integrate the requirements of Department of Energy (DOE) Order 413.3B, "Program and Project Management for the Acquisition of Capital Assets," with the DOE budget formulation process and the safety requirements of DOE-STD-1189, "Integration of Safety into the Design Process."

1.1 Background

INL, an 890-mi^2 section of desert in southeast Idaho, was established in 1949 as the National Reactor Testing Station. Initially, the missions at INL involved development of civilian and defense nuclear reactor technologies and management of spent nuclear fuel. Today, INL is a multi-purpose national laboratory delivering specialized science and engineering solutions for DOE. Sponsorship of INL was formally transferred to the DOE Office of Nuclear Energy (NE) by Secretary Spencer Abraham in July 2002.

INL's move to DOE-NE and designation, along with Argonne National Laboratory, as DOE's lead nuclear energy laboratories for reactor technology supports the nation's expanding nuclear energy initiatives, placing INL at the center of work to develop advanced Generation IV nuclear energy systems, nuclear energy/hydrogen co-production technology, and advanced nuclear energy fuel cycle technologies, and providing national security answers to national infrastructure needs.

The DOE Idaho Operations Office (DOE-ID) also is executing the Office of Environmental Management cleanup mission concurrently with the critical scientific and nuclear energy-related research and development mission of DOE-NE. As part of ongoing cleanup activities at INL, closure of the Radioactive Waste Management Complex (RWMC) is proceeding under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; 42 USC 9601 et seq.). INL-generated radioactive waste has been disposed of at RWMC since 1952 and disposal of contact-handled LLW at the RWMC Subsurface Disposal Area pit ceased on September 30, 2008. An offsite disposal option identified as the preferred alternative for the contact-handled LLW. Disposal of remote-handled LLW in concrete vaults at RWMC will continue until the facility is full or until the facility must be closed in preparation for final remediation of the Subsurface Disposal Area in approximately the year 2017. (This 2017 date represents a 2-year extension of the 2015 date originally planned for availability of the Subsurface Disposal Area.[a]) Providing continued disposal capability for remote-handled waste supports DOE-NE's mission "to lead the DOE investment in the development and exploration of advanced nuclear science and technology." Without established, viable remote-handled LLW disposal capability, ongoing and future DOE-NE programs at INL would be adversely impacted because remote-handled LLW disposal options would need to be considered on a program-by-program basis, resulting in increased costs and schedule impact. Lack of remote-handled LLW disposal capability would likely become a discriminator against new programs at INL, because stakeholder support would not be easily gained without established, compliant waste disposal capability for remote-handled LLW.

In addition, INL hosts the National Nuclear Security Administration's Naval Reactors Facility (NRF). NRF supports the Navy's nuclear-powered fleet through research and development of materials and equipment, as assigned by DOE's Office of Naval Reactors (NR). The INL provides infrastructure support to NRF, which is operated within INL boundaries by Bechtel Marine Propulsion Corporation. According to the memorandum for the record with DOE-ID[b], DOE-ID will provide radioactive disposal support services through INL, including a disposition path for LLW generated at NRF. NRF plays a key role in the Navy's national defense mission. All spent nuclear fuel from the Navy's nuclear powered war ships is sent to NRF for examination, processing, dry storage, and eventual shipment to a geologic repository. NRF processing activities generate remote-handled LLW. A reliable disposal path for remote-handled LLW generated during spent nuclear fuel handling and packaging operations is essential to NRF's continued receipt and processing of Navy spent fuel and, therefore, to the Navy Nuclear Propulsion Program and national security as well.

1.2 Summary Project Description and Scope

INL must ensure that remote-handled LLW disposal capacity exists beyond the end of FY 2017 to meet the needs of INL and its tenant. If remote-handled LLW disposal capacity is not available, ongoing and future INL and tenant operations generating remote-handled LLW would be adversely impacted. Operations that generate remote-handled LLW include the existing Advanced Test Reactor (ATR) Complex, Materials and Fuels Complex (MFC), and NRF. These operations cannot be modified to

[a] Mary V. Wilcox, Acting Director (DOE-ID), to Raymond V. Furstenau, Deputy Manager (Nuclear Energy), "Planning Date for the Remote-Handled Low-Level Waste Vaults (WDP-RWMC-09-083)," December 22, 2009.

[b] Memorandum for the Record between the Pittsburgh Naval Reactors Office and the Idaho Operations Office for the Naval Reactors Facility, June 22, 1984.

eliminate generation of remote-handled LLW. Not only do INL generator sites have limited capacity to store remote-handled LLW, but storage of a significant volume would present operational and regulatory challenges.

To prevent a disposal capacity gap that will occur following closure of the RWMC disposal vaults, INL must have the capability to disposition remote-handled LLW. Current remote-handled LLW generation projections (Figure 1) show that INL will need the capability to dispose of approximately 84 m^3/year of remote-handled LLW, with typical radiation exposure levels up to 30,000 R/hour, by the end of FY 2017, when RWMC stops accepting remote-handled LLW.

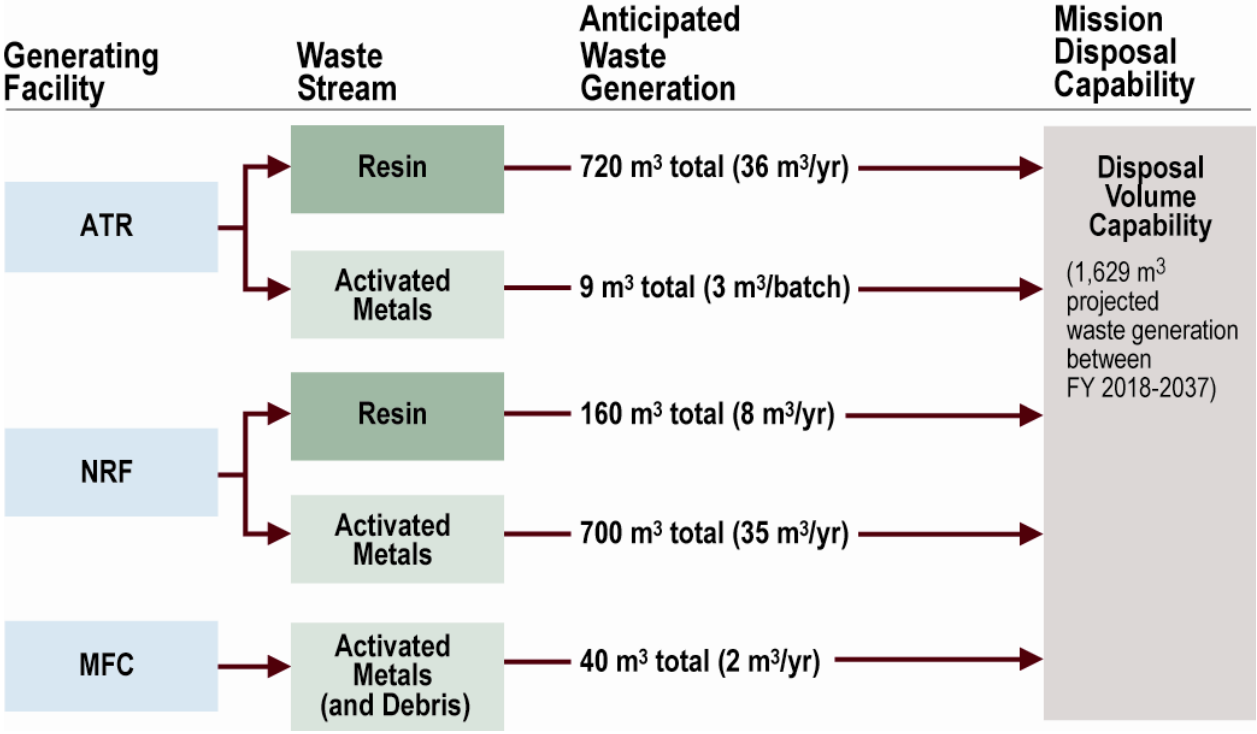


Figure 1. Projection of remote-handled low-level waste generation through Fiscal Year 2037.

NRF's fuel processing activities would be directly affected by a gap in disposal capacity for remote-handled LLW. Remote-handled LLW generated at NRF is currently stored within the canals and storage pool of the facility until it is transferred to a waste disposal liner/scrap cask for transfer to RWMC for disposal. Under current operational schedules, the configuration of the handling process at NRF provides for a maximum interim waste storage capacity of approximately 2 years. Exceeding this interim storage capacity would result in a cessation of fuel-handling activities at NRF until such time as the remote-handled waste could be transferred to another facility for continued interim storage or disposal.

The Spent Fuel Settlement Agreement between DOE, the Department of the Navy, and the State of Idaho (DOE-ID 1995) and an associated Addendum (DOE-ID 2008) address receipt and storage of spent nuclear fuel at INL. INL may receive and store spent fuel for which DOE is responsible on the condition that all DOE spent fuel be removed from Idaho by January 1, 2035. Specific quantities of Naval spent nuclear fuel at INL may be received and stored for a timeframe reasonably necessary for examination, processing, and queuing for shipment to a repository or storage facility outside of Idaho. Naval spent nuclear fuel arriving at INL after January 1, 2017, may be kept in water pool storage for a timeframe reasonably necessary for examination and processing not to exceed 6 years. Processing this fuel generates

remote-handled LLW. Therefore, a disruption longer than 2 years in disposal of NRF remote-handled LLW will negatively impact facility operations, affect national security missions, and jeopardize DOE compliance with the Idaho Settlement Agreement milestones.

1.2.1 Acquisition Strategy

A design-build acquisition strategy will be implemented for the Remote-Handled LLW Disposal Project. The design-build approach will be tailored, as appropriate, to integrate the requirements of DOE Order 413.3B with the DOE budget formulation process and the safety requirements of DOE-STD-1189.

In accordance with DOE Order 413.3B (and associated guidance, DOE Guide 413.3-13, "Acquisition Strategy Guide for Capital Asset Projects") and consistent with recent direction (DOE 2010), a tailored approach to meeting various requirements may be implemented based on the complexity, cost, and risks of the project. Requirements will be addressed to the extent necessary and practical for managing the project. In general, the requirements consider consolidation of decisions, documentation, substituting equivalent documents, concurrency of processes, "bundling" similar projects together, or creating a portfolio of projects to facilitate a single CD, acquisition strategy, and so forth for the entire group of projects. Tailoring also may adjust the scope of independent project reviews and external independent reviews to match the size, risk, and complexity of the projects being reviewed.

The CD-0 Mission Need Statement for the INL Remote-Handled LLW Disposal Project (DOE-ID 2009), created as a result of evaluating INL remote-handled LLW disposal needs, is as follows:

> *The INL will develop replacement remote-handled low-level waste disposal capability by the end of Fiscal Year 2015 to support cost-effective, efficient operations in support of INL's nuclear energy mission and the Naval Nuclear Propulsion Program. Such disposal capability is required to enhance ongoing Departmental and National mission-based research, defense, and energy programs.*

On December 22, 2009, the Office of Environmental Management provided notification of their decision to extend the planning date for closure of the RWMC remote-handled LLW disposal vaults to September 30, 2017. Therefore, the schedule for replacement of remote-handled LLW disposal capability was extended 2 years to the end of FY 2017 (i.e., an operating facility would now be required by the beginning of FY 2018).

The CD process will be tailored to combine CDs 2 (CD-2) and 3 (CD-3) into a single CD-2/3 approval request. The CD-2/3 package, *Approve Performance Baseline and Start of Construction*, will request approval of documentation required for a design-build delivery method as identified in DOE Order 413.3B. The CD-2/3 also will request approval of a performance measurement baseline and request authorization to commence final design and construction of the facility. The performance measurement baseline will be based on potential vendor conceptual designs, costs, and schedules. Final design and construction will commence once construction funds are available. A construction hold-point will be placed in the design-build contract to ensure the design meets nuclear safety requirements and a conditional Disposal Authorization Statement has been obtained in accordance with DOE Order 435.1.

The CD-4 approval request will seek approval to begin operations. The funding request schedule and approach to support this strategy is detailed in the preliminary project execution plan (DOE-ID 2011).

A request for construction funds will be included in the Office of Management and Budget's budget submission to Congress, to be made in January 2012. This submission will be within 12 months of the expected approval of CD-2/3, currently scheduled for December 2012. In compliance with DOE Order 413.3B, the baseline will be established at the upper end of the cost range to envelope unforeseen projects risks until the performance measurement baseline is approved.

1.3 Performance Parameters Required to Obtain Desired Outcome

The INL Remote-Handled LLW Disposal Project will provide remote-handled LLW disposal capability for ongoing and future programs at INL. The proposed strategy promotes continued development of the DOE-NE mission at INL, continued support of the Naval Nuclear Propulsion Program, and responsible, sound waste management by DOE.

The proposed remote-handled LLW disposal facility will provide concrete disposal vaults, support office and storage structures (with associated infrastructure), and transport casks needed to dispose of the estimated quantities of activated metals and ion-exchange resins classified as remote-handled LLW. The proposed concrete vault system would consist of precast concrete cylinders stacked on end in an array. Each stacked cylinder would be placed on a concrete base and would have a separate removable concrete plug placed on the top of the cylinder to serve as a radiation shield and a water barrier.

Specifically, the proposed remote-handled LLW disposal facility (i.e., vaults and monitoring wells, buildings, and cask transport system) will be designed to do the following:

- Provide casks that can accommodate the configuration and radionuclide content of the legacy and newly generated ATR Complex and MFC waste
- Provide site preparation/infrastructure (i.e., fencing, firewater, potable water, electricity, and a septic system) and office and maintenance buildings
- Provide a concrete vault disposal system that can accommodate cask liners used for disposal of remote-handled LLW generated at NRF
- Provide a concrete vault disposal system that can accommodate cask liners currently being used for disposal of remote-handled LLW ion-exchange resins generated at the ATR Complex
- Provide a concrete vault disposal system that can accommodate cask liners anticipated for use in disposal of remote-handled LLW generated at the ATR Complex and MFC
- Accommodate cask liner placement methods currently in use at RWMC, which will maximize continued use of existing remote-handled loading and equipment and proven procedures for the NRF shipping cask
- Provide necessary equipment to unload cask liners anticipated for use in remote-handled LLW disposal from the ATR Complex and MFC
- Provide all-season road access that will accommodate anticipated loads from cask transport vehicles without causing damage to the existing infrastructure
- Top-load cask liners into vaults while providing the appropriate level of shielding and worker protection

- Provide a vault/plug assembly that will secure emplaced contents, minimize entry of water into vault, and allow drainage of any moisture/condensate that accumulates inside the vaults
- Allow access to individual vaults without disturbing adjacent vaults
- Accommodate the weight and structure of the top shielding/sealing plug, cask-to-vault adapting structure, scrap cask, waste containers, and lifting crane (all concurrently)
- Provide shielding sufficient to reduce radiation levels on top of the vaults when the plugs are in place to levels specified in DOE Order 435.1, "Radioactive Waste Management"
- Provide monitoring wells for use in the operational phase, as required.

1.4 Major Applicable Conditions

The INL Remote-Handled LLW Disposal Project will be closely integrated with INL and NRF operations to ensure mission execution is not impacted. Upon selection of a specific INL location for the proposed disposal facility, final design and construction will be coordinated with applicable operations personnel to ensure utility interface, security, and emergency response. As new INL programs develop, waste management activities will be closely coordinated to ensure the most cost-effective and efficient waste disposal practices are implemented and that generator-disposal facility interfaces and requirements are clearly defined and accounted for.

The most significant conditions affecting the project are as follows:

- Planned closure of the Subsurface Disposal Area
- High radiation levels associated with INL-generated remote-handled LLW
- Lack of sufficient interim storage capability to address a disposal capability gap greater than 2 years
- Effect of remote-handled LLW disposal capability on ongoing and future missions at INL
- Used condition of existing equipment
- The final NRF waste disposal requirements.

1.5 Environmental, Regulatory, Safety, Technology Development, Security, and Political Sensitivities

1.5.1 Environmental and Regulatory Issues

No environmental issues have been identified to date that would significantly impact this project. The project entails excavation of soil to emplace a replacement vault system. Construction of an access road, support buildings (storage and office), infrastructure (e.g., electrical, potable water, and septic), and the acquisition of a transport cask (with associated transfer equipment) will be needed.

Preliminary National Environmental Policy Act (NEPA) analysis during the pre-conceptual phase indicated that an environmental assessment is appropriate to address impact and elicit public involvement. The strategy for NEPA compliance is documented in a NEPA Strategy (INL 2010a). Natural and cultural

resources affected at INL will be analyzed and included in an environmental assessment. For example, terrestrial habitats may be disturbed by construction.

The potential exists that the sage grouse and pygmy rabbit will be listed as threatened or endangered under the Endangered Species Act (PL 93-205) during the planning process of this project. The U.S. Fish and Wildlife Service is required to reexamine the need for this action under court orders (United States District Court 2007a and 2007b). The listing of either species could cause project delays, because a biological opinion by the U.S. Fish and Wildlife Service would be required and possible increased project costs would be incurred due to reexamination of alternatives, siting studies, and implementation of protective measures. If either of these species was listed as threatened or endangered and it is determined that the project would have the potential to significantly impact either species, the level of NEPA analysis would be increased to an environmental impact statement. The U.S. Fish and Wildlife Service recently determined that listing of sage grouse is warranted but is precluded at this time by higher priority listing actions (U.S. Fish and Wildlife Service 2010). No decision has been made yet on pygmy rabbits.

Issues that could arise during preparation of the environmental assessment include concerns about the impacts of the proposed action or alternatives and the potential for addition of new species to the list of threatened and endangered species. The public also may be concerned about impacts to groundwater from an onsite remote-handled LLW disposal facility. A discussion of impacts to groundwater will be included in the environmental assessment. Performance of the facility also will be evaluated in the performance assessment and composite analysis required under DOE Order 435.1.

1.5.2 Environmental, Safety, and Health Requirements

The following are statutes, regulations, orders, and agreements that have been identified as potentially applicable to the proposed remote-handled LLW disposal facility (as envisioned in the conceptual design). The construction and operation of a remote-handled LLW disposal facility will be in compliance with applicable environmental, safety, and health compliance requirements.

DOE Order 435.1 establishes requirements to ensure that all DOE radioactive waste is managed in a manner that is protective of workers, public health and safety, and the environment. Requirements contained within DOE Order 435.1 directly pertain to design of the remote-handled LLW disposal facility.

DOE Order 450.1, "Environmental Protection Program," ensures implementation of sound stewardship practices that are protective of the air, water, land, and other natural and cultural resources impacted by DOE operations and by which DOE cost effectively meets or exceeds compliance with applicable environmental, public health, and resource protection laws, regulations, and DOE requirements. As required by the order, all DOE elements must ensure that the site Integrated Safety and Management System includes an environmental management system component that provides for public health and environmental protection, pollution prevention, and compliance with applicable environmental protection requirements.

DOE Order 420.1B, "Facility Safety," establishes facility safety requirements for nuclear safety design, criticality safety, fire protection, natural phenomena hazards mitigation, and a system engineer program. These requirements are addressed in the safety design strategy (INL 2010b) and the conceptual safety design report (INL 2010c).

DOE Order 5400.5, "Radiation Protection of the Public and the Environment," establishes standards and requirements for operation of DOE and DOE contractors with respect to protection of members of the public and the environment against undue risk from radiation.

The Spent Fuel Settlement Agreement between DOE, the Department of the Navy, and the State of Idaho (DOE-ID 1995) and an associated Addendum (DOE-ID 2008) address receipt and storage of spent nuclear fuel at INL. This agreement permits DOE to receive up to 1,133 shipments of spent nuclear fuel at INL for storage over 40 years. In return, the agreement sets a timetable for treatment of high-level waste now stored at the Idaho Nuclear Technology and Engineering Center, and removal of 65,000 m^3 of transuranic waste stored at RWMC. The agreement also establishes a schedule to place all spent fuel at INL in dry storage so that the DOE fuel is ready for shipment offsite by the year 2035 per the Addendum (DOE-ID 2008). Specific quantities of Naval spent nuclear fuel at INL may be received and stored for a timeframe reasonably necessary for examination, processing, and queuing for shipment to a repository or storage facility outside of Idaho. No compliance requirements are contained within the agreement that pertain to the conceptual design of a remote-handled LLW disposal facility. The Naval Nuclear Propulsion Program requires that disposal capacity be available in the process of readying spent nuclear fuel for final disposition.

The primary objective of the Clean Air Act (42 USC § 7401 et seq.) is for the U.S. Environmental Protection Agency to establish federal limits for certain air pollutants, including radionuclides, in the atmosphere to ensure basic and environmental health protection. States develop a state implementation plan, which is a collection of regulations used to prevent air pollution. The State of Idaho has an approved state implementation plan and the regulations are found in the Idaho Administrative Procedures Act (IDAPA).

IDAPA 58.01.01.201 requires that a "permit to construct" be issued for new sources: "No owner or operator may commence construction or modification of any stationary source, facility, major facility, or major modification without first obtaining a permit to construct from the Department which satisfies the requirements of Section 200 through 228 unless the source is exempted." Application procedures to obtain a permit to construct are identified in IDAPA 58.01.01.202. The INL will complete an Air Permit Applicability Determination to determine the need for "permit to construct".

In addition to the State of Idaho "permit to construct," requirements of the National Emissions Standards for Hazardous Air Pollutants must be considered as potentially applicable to the project. INL is subject to 40 CFR 61.90 through 61.97 as stated: "The provisions of this subpart apply to operation of any facility owned or operated by DOE that emits any radionuclide other than radon-222 and radon–220 into the air." Section 40 CFR 61.96 states that such a facility that has potential for an unmitigated effective dose equivalent to a member of the public greater than or equal to 0.1 mrem/year, as calculated using the method in 40 CFR Part 61, Appendix D, must submit an application to construct to the Environmental Protection Agency Region 10 and receive approval before construction begins. Potential radioactive emissions associated with operation of the proposed remote-handled LLW disposal facility will be calculated and discussed in the NEPA documentation being prepared for this project. This information will be used to determine the Clean Air Act compliance requirements that must be addressed.

NEPA is the national charter for environmental planning (42 USC § 4321 et seq). NEPA requires that the effects of federal actions on the environment be considered equally with economic, technical, and other factors associated with the proposed action.

1.5.3 Pollution Prevention Plans

Waste minimization activities should be incorporated and designed into all activities associated with the proposed remote-handled LLW disposal facility. Proper design criteria and optimization can greatly affect waste generation and are critical in pollution prevention. A strategy for management and

minimization of waste is determined by the waste management policy of DOE Order 435.1. The environmental management system component of the Integrated Safety Management System provides for systematic planning, execution, and evaluation of the pollution prevention program. During design of the facility, consideration should be given to construction processes and materials that will generate the least amount of waste and impacts on the environment.

Construction contracts will require the subcontractor to protect the environment. Throughout construction, stormwater management and dust suppression techniques will be implemented to appropriately control erosion/stormwater containment and mitigate air pollution, respectively.

1.5.4 Safeguards and Security

The project will be coordinated with site security to ensure that the measures taken are appropriate. At a minimum, an area will be established using 8-ft high lockable fencing for the purpose of property protection. A security system will be in place to allow remote monitoring of the facility from an offsite location (as determined by INL Security). The monitoring location will be determined by the INL Security organization. Insider threats and sabotage risks will be analyzed and mitigated in accordance with the existing INL Security Program and will be consistent with current practices and operational risks at RWMC.

A formal review will be conducted, based on the final design and location of the facility, to ensure all necessary security measures are in place prior to the start of operations.

Consistent with DOE 420.1B, facility design will accommodate all requirements for safeguards and security, access control, and emergency egress. Where conflict occurs between such requirements, life safety requirements have precedence. As designed, the proposed facility must comply with the letter and intent of the order and present no risk to employee with respect to NFPA 101, “Life Safety Codes.”

1.5.5 Technology, Research, and Development

The conceptual design is based on the existing remote-handled LLW vaults located at RWMC. The proposed replacement facility represents the next generation of this design and provides an opportunity to incorporate enhancements that support the performance objectives defined in DOE Manual 435.1-1 Change 1, “Radioactive Waste Management Manual.” Toward that end, the disposal facility will be designed using a total systems approach that may include combinations of natural and engineered barriers. Engineered barriers include, but are not limited to, waste forms, containers, vaults, caps, liners, and berms.

The effects of natural and engineered barriers on the performance of the disposal system during all phases of facility life (i.e., short and long-term and intact and altered) will be analyzed using a combination of qualitative and quantitative techniques. The level of technical maturity and the need for research, development, demonstration, testing, and evaluation prior to implementation also will be addressed. Engineered features determined to improve facility performance will be considered for inclusion in the design; likewise, engineered features determined to compromise the performance of the natural disposal system will be eliminated from further consideration. The results of this evaluation will be documented in the performance assessment. DOE’s LLW Federal Review Group, comprised of external subject matter experts, will conduct an independent review of the disposal system evaluation and resulting recommendations. Design features accepted for inclusion will be incorporated in the technical and functional requirements (TFR-483) that will form the technical basis for facility design. The results of this evaluation will be incorporated in the performance baseline established at CD-2/3.

As a risk mitigation measure, a liner has been included in the conceptual design, as reflected in the conceptual design report (INL 2011). The liner depicted is a conservative engineered barrier; therefore, its cost and schedule are considered worst case and will envelop what would be incurred for any of the evaluated liner alternatives. The cost and schedule data for this liner are included in the baseline described in Section 4 of the preliminary project execution plan (DOE-ID 2011).

1.5.6 Funding Issues

The funding profile represented is a multiyear funding strategy that depends on approval of fiscal budgets. Late receipt of funding represents risk to the overall project schedule and could delay contract awards and increase project cost. This project will be acquired using a combination of operating and line item construction funds provided by DOE-NE and DOE-NR. The NE/NR annual funding contributions will be renegotiated annually consistent with current project information.

1.5.7 Stakeholder Issues

Project support from local and regional stakeholder advocacy groups (e.g., Snake River Alliance) is expected to be mixed depending on the selected alternative. Local stakeholder concerns will likely focus on the disposal location, specific design elements of the disposal facility, methods to prevent air-borne radionuclide contamination, and methods to protect the Snake River Plain Aquifer from radionuclide contamination. Stakeholder considerations will be addressed as part of the environmental assessment development process, which will provide opportunity for comment on DOE's proposed action.

2. COST AND SCHEDULE RANGE

2.1 Total Project Cost Range

TPC includes all costs associated with the project, including contingency, to the point the proposed disposal facility is turned over for routine operations. TPC includes all capital costs and operating costs associated with the project. The TPC is composed of total estimated cost (TEC) and other project cost (OPC). The TPC range for the design, siting, construction, and turnover to operations of a new INL remote-handled LLW disposal facility is captured in Table 1. Details on these costs, as broken down by work breakdown structure elements, are contained in Section 4 of the preliminary project execution plan (DOE-ID 2011). The expected accuracy range associated with each target value is defined by lower (-15%) and upper (+20%) bounds. These figures are presented in Table 1.

Table 1. Total project costs.

Project Cost Element	Lower Bound[a] ($M)	Target ($M)	Upper Bound[a] ($M)
TEC[b]	45.66	53.71	64.46
OPC[b]	17.60	19.71	22.57
DOE-held contingency	5.15	5.15	5.15
TPC[b]	68.41	78.57	92.18

a. The accuracy range (-15% to +20%) does not apply to DOE-held contingency or to historical costs (in OPC); therefore, the upper and lower bounds are not exactly -15% or +20% from the target.
b. Includes management reserve.

TEC includes design and construction of the disposal facility using a design-build project delivery method. Included within TEC are all costs associated with disposal vaults, required facility infrastructure, procurement of a new onsite transport cask, and installation of monitoring wells. TEC also includes INL oversight and integration with the design-build subcontractors, development of final nuclear safety documentation, and project management and reporting during the construction phase, as appropriate.

OPC includes costs associated with development of the following:

- Development of advanced facility concepts and design-build bids by potential contractors
- Preparation of required NEPA (42 USC § 4321 et seq.) documentation
- Preparation of safeguards and security documentation
- Development of the project performance baseline
- Development of performance specifications and requests for proposal for the design-build contracts for vaults, infrastructure, and transportation casks
- Development of the performance assessment and composite analysis (and supporting documentation) necessary to obtain a Disposal Authorization Statement per DOE Order 435.1
- Relocation of equipment from RWMC to the new disposal facility to support operations
- Development of operations procedures
- Operations training.

Management reserve and DOE-held contingency are included in the TPC cost ranges, as reflected in Table 1 and Section 4.3 of the preliminary project execution plan (DOE-ID 2011).

2.2 Project Contingency

In accordance with DOE Order 413.3B, contingency covers costs that may result from unforeseen and unpredictable conditions, or uncertainties outside the INL contract baseline, but which could affect the project outcome. The amount of contingency held depends on the status of design, procurement, and construction; and the status of external uncertainties that could impact project outcome. Project contingency is held and managed by DOE.

For this project, contingency will be held to address risk elements that are external to the scope of the project. Several risk elements that affect contingency have been identified. The analysis of these risks is included in Section 3.4.

Cost contingency was assigned based on external risks (i.e., outside the project's control). The cost profiles presented in this document and throughout the CD-1 documentation include a DOE-held contingency. All risk elements are captured in the risk management plan for the Remote-Handled LLW Disposal Project (PLN-2541).

The risk-based, graded approach used to estimate contingency includes the following:

- Identifying all high or medium external risks (i.e., those risks that are dependent on government organizations to mitigate) as contributing to DOE-held contingency
- Identifying a reasonable assumed residual risk cost impact (for external risks)
- Summing the mitigation costs and the assumed residual risk cost impacts for external risks.

2.3 Funding Profile

The funding profile for TPC, split into TEC and OPC, is shown in Figure 2. This funding is expressed using planned upper bound estimates, as contained in Table 5-1 and Section 4.3 of the preliminary project execution plan (DOE-ID 2011b). This funding profile reflects receipt of capital funding from FY 2013 through 2016. A request for construction funds will be included in the Office of Management and Budget's budget submission to Congress to be made in January 2012. This submission will be within 12 months of the expected approval of CD-2/3, currently scheduled for December 2012. The construction funds request can be made prior to CD-2/3 approval because the baseline will be established at the upper end (+20%) of the cost range. For additional details on project costs, refer to Section 4.3 of the preliminary project execution plan (DOE-ID 2011).

2.4 Key Milestones and Events

The CD timeframe for the INL Remote-Handled LLW Disposal Project is 2009 through 2017. The CD milestones support a FY 2017 project completion date (see Table 2). Additional details on key milestones and events are provided in Section 4.2 of the preliminary project execution plan (DOE-ID 2011).

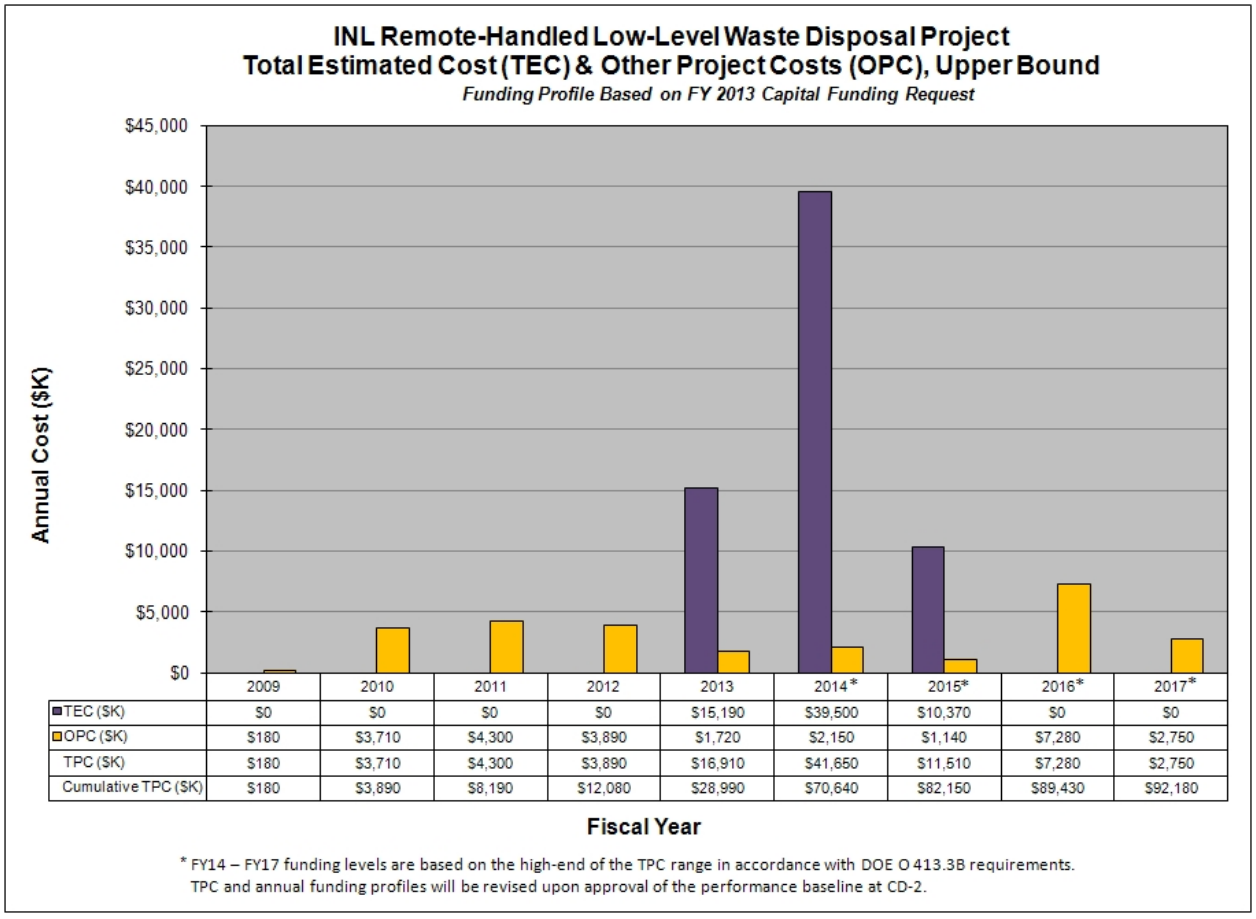
Table 2. Critical decision milestones for the Remote-Handled Low-Level Waste Disposal Project.

Description	Planned Dates
CD-0, *Approve Mission Need*	07/2009 (actual)
CD-1, *Approve Alternative Selection and Cost Range*	06/2011
CD-2/3, *Approve Performance Baseline and Start of Construction/Fabrication*	12/2012
Final Design Complete	08/2013
Approve Start of Construction (hold point)	05/2014
Construction/Fabrication Complete	10/2016
CD-4, *Approve Start of Operations*	09/2017

Approval of CD-1, including the conceptual safety design report, is being sought and is planned for the third quarter of FY 2011.

The CD-2/3 request will include approval of the project baseline, updated project documents, the design-build procurement package, and authorization to initiate construction activities. In addition, the CD-2/3 request will have appropriate hold points (e.g., final design complete) prior to obtaining authorization to start construction and fabrication activities.

The CD-4 request supports approval for start of operations before the end of FY 2017, when the current remote-handled LLW disposal capability at RWMC is planned to cease. By adopting this approval sequence, the project is appropriately aligned with the DOE Order 413.3B.



	2009	2010	2011	2012	2013	2014*	2015*	2016*	2017*
TEC ($K)	$0	$0	$0	$0	$15,190	$39,500	$10,370	$0	$0
OPC ($K)	$180	$3,710	$4,300	$3,890	$1,720	$2,150	$1,140	$7,280	$2,750
TPC ($K)	$180	$3,710	$4,300	$3,890	$16,910	$41,650	$11,510	$7,280	$2,750
Cumulative TPC ($K)	$180	$3,890	$8,190	$12,080	$28,990	$70,640	$82,150	$89,430	$92,180

Figure 2. Funding profile for the Remote-handled Low-Level Waste Disposal Project.

3. ALTERNATIVES AND RISK ANALYSIS

3.1 Technical Alternatives Analysis

As summarized in the Mission Need Statement (DOE-ID 2009) for the project, multiple alternatives were considered for providing continued, uninterrupted remote-handled LLW disposal capability. Alternatives that were considered included using existing and planned INL capabilities and assets, development of a new onsite remote-handled LLW disposal facility, offsite disposal of INL and tenant-generated remote-handled LLW, privatization of remote-handled LLW disposal, and no action.

An analysis of the alternatives identified in the Mission Need Statement was prepared in support of CD-1 approval of the alternative selection and cost range for the project (INL 2010d). The range of alternatives was screened, and the following two alternatives were considered potentially viable in establishing continued, uninterrupted remote-handled LLW disposal capability for INL and its tenants:

1. Design, construction, and operation of a new onsite remote-handled LLW disposal facility

2. Offsite disposal at the Nevada National Security Site (NNSS) (formerly known as the Nevada Test Site).

Table 3 summarizes the results of this analysis for the alternatives presented in the Mission Need Statement. As documented in the alternatives analysis report (INL 2010d), the two potentially viable alternatives were further analyzed. Offsite disposal facilities were initially screened based on technical viability, meeting schedule constraints, cost, complexity, and risk. NNSS was chosen as the most viable offsite option and was used to assess the offsite versus onsite alternatives.

Criteria were selected and each alternative was ranked in accordance with the criteria identified in Table 4. Each criterion was assigned a relative weighting factor from 1 to 3. Each alternative was assigned a score of 1 or 2 for each criterion, with 1 being assigned to the preferred alternative for that specific criterion (i.e., a rank of 1 was assigned to the alternative with the lowest cost, smaller impact, or least opposition). A total score was obtained by multiplying the weighting factor times the rank for each criterion and then summing all the scores for the individual criteria. The alternative with the lowest total score represents the preferred alternative for providing continued, uninterrupted remote-handled LLW disposal capability for INL operations.

Onsite disposal of INL and tenant-generated remote-handled LLW has the lowest life-cycle cost to DOE and provides the lowest risk of the potentially viable alternatives considered. Costs are reduced through avoidance of costs associated with developing transportation infrastructure and to conduct offsite shipments. Project risks (i.e., uncertainty of the availability of offsite facilities) are eliminated using onsite disposal. Reliance on other activities or programs in order to achieve disposal also is minimized, which reduces complexity.

Offsite disposal, in addition to having the highest life-cycle cost, involves significant challenges. First, shipping waste offsite has inherent risks associated with commercial shipment of radioactive waste. These include routine exposure to shipping crews and the public, potential for involvement in serious accidents or of rerouting and delays due to accidents not involving the shipment itself, and attractiveness to terrorists for diversion or destruction. Offsite disposal is the more complex and riskier alternative, requiring changes to infrastructure at multiple locations and acquisitions of material requiring third party certification.

Second, the increased number of offsite shipments from NRF compared to onsite shipments would create significant operational constraints and burdens on NRF and potentially conflict with NRF's primary mission to support the National Nuclear Propulsion Program.

Finally, offsite disposal does not offer a guaranteed solution. Reliance on special performance assessments for regular waste shipments has significant risk. Individual shipments may be sufficiently out of the norm to be unable to qualify for disposal. Over reliance on routine exceptions may cause the validity of the special performance practice to be questioned, halting a series of shipments.

Privatization of remote-handled LLW disposal represents the highest risk to DOE. Through establishment of a new onsite remote-handled LLW disposal facility, risks associated with transport of highly radioactive waste will be reduced, life-cycle waste management costs will be minimized, and the necessary waste management infrastructure to support ongoing and future DOE-NE and DOE-NR programs will be maintained. Development of a new onsite disposal facility will yield the following benefits:

- Provide for uninterrupted remote-handled LLW disposal capability, thereby minimizing potential impacts on INL and NRF operations.

Table 3. Analysis summary of the remote-handled low-level waste disposal alternatives.

Disposal Alternative	Credible?	Summary Rationale for Conclusion
Continued Disposal at RWMC	No	The option to continue disposal at RWMC cannot be implemented because RWMC is planned for closure under INL's clean-up agreement. Continuing operation of the remote-handled LLW vaults while permanently closing the remainder of the facility is not credible given the facility configuration. This option is not available to meet the mission need.
Disposal at the Idaho CERCLA Disposal Facility	No	Disposing of remote-handled LLW at the Idaho CERCLA Disposal Facility would face severe obstacles in terms of obtaining regulatory approvals, conflicting design objectives with the existing cells, and possible conflict with the main mission of the Idaho CERCLA Disposal Facility – consolidation and disposal of all INL CERCLA waste. The likelihood of obtaining all necessary approvals to expand the Idaho CERCLA Disposal Facility waste acceptance criteria to accept remote-handled LLW is extremely low and the risk that this alternative could not be implemented in time to meet the mission need by 2017, if ever, is too great to consider this a credible option.
Interim Storage	No	The generator facilities have very limited storage capacity available and there are no plans to expand interim storage capability at NRF or the ATR Complex. Additionally, there are no other existing or planned facilities onsite to which the remote-handled LLW could be transferred for interim storage without significant capital and operational investment. This option would represent a significant capital expenditure without providing an actual solution to meeting the mission need of providing for permanent disposal of remote-handled LLW generated at INL beyond FY 2017 and is not considered a credible alternative.
Storage for Decay	No	Starting with an initial surface exposure rate of 30,000 R/hour, this waste would require storage for approximately 130 years to decay below the 200-mR/hour criteria for remote-handled LLW. As is the case for the Interim Storage option, the facilities do not exist onsite for this storage. Providing this storage would require INL to construct or otherwise find new storage capacity at least equivalent to the disposal capacity needed to meet the mission need for continuous remote-handled LLW. Therefore, storage for decay is not considered a credible alternative.
Design, Construct, and Operate a New Onsite Remote-Handled LLW Disposal Facility[a]	Yes	This alternative was found to be a credible candidate for further analysis because essentially the same activities are already being performed onsite. Risks of implementing this alternative are minimal because the disposal facility design uses current practices and equipment. Long-term impacts and stakeholder objections can be mitigated through design, operating, monitoring, and closure standards. The risks of siting, construction, and operation are generally within DOE control. Costs can be estimated within a reasonable range of certainty and no completely disqualifying characteristics are known.

Table 3. (continued).

Disposal Alternative	Credible?	Summary Rationale for Conclusion
Dispose of All Remote-Handled LLW Offsite at NNSS[b]	Yes	This alternative was found to be a credible candidate for further analysis because all remote-handled LLW in question can meet the NNSS waste acceptance criteria (with a special performance assessment). Shipping feasibility has been demonstrated by existing practices of shipping some remote-handled LLW to NNSS. Additional risks and costs versus the onsite alternative exist but do not appear insurmountable. A project would be needed to acquire new shipping cask systems, but an acceptable cask appears to exist (at least in the planning and certification stage). Future disposal costs are uncertain because costs are based on total amount disposed of from all generators. The risk of single-point failure if NNSS is unable to receive waste would have to be accepted or mitigated. Costs can be estimated within a reasonable range of certainty; however, future disposal costs are uncertain because of the effects of other DOE facility uses of NNSS on its cost basis. No completely disqualifying characteristics are known.
Privatization of INL Remote-Handled LLW Disposal	No	The complex process of constructing an onsite, privately-owned and operated facility or speculating that an offsite commercial facility will be placed in operation in time to support uninterrupted INL and tenant-generated remote-handled LLW disposal would represent severe programmatic risk with no discernable advantage over known viable options. If such capability did not come to fruition, the resulting impacts to both DOE-NE and DOE-NR missions would be substantial. This option poses too high a risk of not meeting the mission need of providing for permanent disposal of remote-handled LLW generated at INL beyond FY 2017 and is not considered a credible alternative.
No Action	No	Given the low storage capacity for these waste streams at generators' sites, this alternative would result in a cessation of operations on vital national missions in just a few years. Therefore, considering the long-term DOE missions at INL, the no action alternative is not a viable alternative. The no action alternative will still be carried forward to the NEPA evaluation.

a. Appendix A of the Alternatives Analysis Report (INL 2010d) provides analysis detail on the selection of the new onsite facility as the best onsite alternative.
b. Appendix B of the Alternatives Analysis Report (INL 2010d) provides analysis detail of eight candidate offsite facilities and the selection of NNSS as the best offsite alternative.

Table 4. Ranking of alternatives for Idaho National Laboratory remote-handled low-level waste disposal capability.

Evaluation Category	Criteria	Weighting Factor	Alternative Risk[a]		Weighted Score[b]	
			Onsite Disposal	Offsite Disposal	Onsite Disposal	Offsite Disposal
Risk	Potential impacts to DOE-NE and DOE-NR operations (risk to mission need)	3	1	2	3	6
	Risk to the public from increased waste transport on public roads	2	1	2	2	4
Cost	Life-cycle cost to DOE-NE and DOE-NR operations	2	1	2	2	4
	Capital project expenditure	2	1	2	2	4
Complexity	Interaction of third parties in regulation of waste transport and disposal activities	1	1	2	1	2
Stakeholder values	Idaho stakeholder opposition	2	2	1	4	2
	Other host state stakeholder opposition	2	1	2	2	4
Regulatory compliance	Certainty of achieving disposal for INL's remote-handled LLW	2	1	2	2	4
	Compliance with DOE Order 435.1 (disposal at generation site)	1	1	2	1	2
		Total			19	32

a. Lower number is the more preferred alternative.

b. Score = rank times the weighting factor. Lowest score is preferred.

- Allow for continued processing of Navy fuels at NRF, enabling compliance with the Spent Fuel Settlement Agreement milestone to have all DOE spent nuclear fuel removed from the State of Idaho by the year 2035.

- Eliminate the need for significant capital investment in major infrastructure modifications to support offsite disposal of remote-handled LLW, including, but not limited to, development of a Nuclear Regulatory Commission-licensed, Department of Transportation-compliant cask system(s) for offsite transportation; facility infrastructure modifications to support the new transport system(s); and expansion of onsite interim storage capabilities to address offsite shipment campaigns.

- Provide for remote-handled LLW management and disposal consistent with DOE Order 435.1, which states:

  > *DOE radioactive waste shall be treated, stored, and in the case of low-level waste, disposed of at the site where the waste is generated, if practical.*

- Maintain DOE control of remote-handled LLW disposal and decrease the potential for diversion or sabotage of waste with the highest radiation readings.

- Provide a consistent, sitewide waste management system, reducing required coordination among multiple programs to identify and implement cost-effective waste management options.

- Reduce dependence on cooperation of third parties (i.e., disposal site operators), states other than Idaho (shipment and disposal), and other federal agencies (e.g., Nuclear Regulatory Commission for cask certification) to the absolute minimum.

- Provide the most cost-effective approach for managing remote-handled LLW, minimizing DOE life-cycle costs.

A formal DOE decision on how to proceed with the project will be made in accordance with the NEPA process. NEPA documentation, in the form of an environmental assessment, is planned.

3.2 Location Alternatives Analysis

A siting study will be conducted to support the alternative of an onsite disposal location. The study will evaluate and identify candidate locations at INL that can meet technical and programmatic objectives for remote-handled LLW disposal.

The purpose of the study will be to identify potential site areas or locations within INL boundaries for further consideration in the NEPA process as part of the alternatives analysis for onsite disposal. Five key elements have been identified as the primary contributors to development of the siting criteria. These key siting elements synthesize information and requirements from the following five areas:

1. Regulations

2. Key assumptions

3. Conceptual design

4. Facility performance

5. Previous siting study findings.

The study will identify regulations, codes, and procedures that may be applicable to siting such a facility or that are useful in determining specific siting criteria. The siting study, finalized as part of the NEPA process during CD-2, will consider the requirements of DOE Manual 435.1-1 in establishing and evaluating the criteria for potential sites for the new proposed facility. A complete performance assessment of the selected location and final facility design will be performed to demonstrate compliance with all performance requirements of DOE Manual 435.1-1.

3.3 Highest Ranked Alternative

Based on the ranking presented in Table 4, the highest ranked alternative is development of a new onsite remote-handled LLW disposal facility. Onsite disposal of INL and tenant-generated, remote-handled LLW has the lowest life-cycle cost to DOE and provides the lowest risk of potential impacts on DOE-NE and DOE-NR. Costs are reduced through avoidance of costs to develop transportation infrastructure and to conduct offsite shipments. Project risks (i.e., uncertainty of availability of offsite facilities) are eliminated using onsite disposal. Reliance on other activities, programs, or third parties in order to achieve disposal also is minimized, reducing disposal complexity. The onsite alternative did rank lower than the offsite disposal alternative on the criterion of Idaho stakeholder opposition, indicating a project risk to be addressed as part of project planning and implementation.

Offsite disposal, in addition to having a higher life-cycle cost due to the limitations on the amount of remote-handled LLW that can be packaged into each container for transport, is complicated by transportation issues associated with transporting highly radioactive waste in commerce and the infrastructure and processing changes at the generating facilities, specifically NRF, that would be required to support offsite disposal.

3.4 Risk Analysis

In accordance with DOE guidance (DOE Guide 413.3-13), risks associated with acquisition were identified. The risks considered for selection of the acquisition strategy fall into the following categories:

- Funding and budget
- Legal and regulatory
- Location and site conditions
- Cost and schedule
- Functional
- Scope and definition
- Interfaces
- Stakeholder issues.

Specific risks and mitigation actions are identified. Criteria also are established for use in selecting a preferred acquisition strategy. The design-build approach meets the established criteria. Table 5 provides a summary of the risks by category, their mitigations, and the criteria.

Table 5. Risk analysis for the Remote-Handled Low-Level Waste Disposal Project.

Risk Category	Risk Definition	Mitigation Action(s)	Criteria for Acquisition Strategy
Funding and Budget	If project funding is not received or is delayed during project execution (due to lack of priority or difficulty in government funding cycles), planned critical path activities may be impacted.	• Ensure a clear prioritization strategy for funding • Work with DOE Headquarters for prioritization of funding • Streamline critical path activities • Ensure budget for consistent project management	• Simple delivery method approach • Contractor ability to adjust schedule to accommodate funding profile
Legal and Regulatory	If the environmental assessment does not result in a finding of no significant impact, then an environmental impact statement is required.	• Clearly defined NEPA strategy • Defined project requirements that minimize environmental impacts • Actively employ communication strategy to engage DOE Headquarters	• Contractor available with proven technical and regulatory capabilities to support NEPA analysis
	If a stakeholder(s) files lawsuit against DOE, then significant delays will result.	• Clearly defined NEPA strategy with strict adherence to the NEPA process • Actively employ communication strategy to engage the public	• Proven federal or contractor capability to communicate with stakeholders
Functional	If an updated Natural Phenomena Hazard Assessment for the INL site identifies new deficiencies that require design changes, then significant cost and schedule impacts will result.	• Communicate within DOE to accomplish necessary analyses • Proven design that provides protective measures from natural hazards • Effective communication with DOE Headquarters and Office of Engineering and Construction Management	• Communicate within DOE to accomplish necessary analyses • Proved design that provides protective measures for natural hazards • Maintain frequent and effective communication and interface with DOE-NE Headquarters and DOE Office of Engineering and Construction Management • Proven technical and engineering capabilities available to integrate siting and nuclear safety aspects into design criteria
Interfaces and Integration	If CD-4 (likely all CD approvals) is not approved on schedule, then the facility may not be operational by the required date and significant programmatic impacts would be imposed on generators (MFC/ATR/NRF).	• Management assessments at start of construction • Actively employ a communication strategy between DOE-ID and DOE Headquarters on CD approach and approval	• Proven contractor capability to maintain critical path schedule

Table 5. (continued).

Risk Category	Risk Definition	Mitigation Action(s)	Criteria for Acquisition Strategy
Stakeholder Issues	If there is stakeholder resistance to siting and construction of a remote-handled LLW disposal facility at INL, then a protracted schedule and increased costs, resulting from activities necessary to resolve stakeholder issues, would result.	• Actively employ a communication strategy to engage the public • Performance assessment/composite analysis proof of low health and safety risk	• Proven federal or contractor capability to communicate with stakeholders • Proven federal or contractor performance assessment expertise
	If the Greater-Than-Class C environmental impact statement is issued, where INL is a potential disposal site, stakeholders' perceptions that the new onsite disposal facility will be expanded to include Greater-Than-Class C would result. This will cause significant resistance and subsequent delays.	• Monitor progress of the Greater-Than-Class C environmental impact statement decisions that could affect INL • Actively employ a communication strategy to engage the public • Actively employ communication strategy to engage DOE Headquarters	• Proven federal or contractor capability to communicate with stakeholders
Expertise and Human Resources	If the design/build philosophy requires a vendor to interpret safety basis and quality assurance-related requirements, then issues may not be identified (or not identified early enough), resulting in significant construction rework.	• Perform additional reviews (more than currently planned) and third-party evaluations of specification prior to including it in contract documents • Plan for (and get vendor to agree to) additional oversight to ensure uncertainties are addressed early and resolved in the final design review • Place quality assurance and nuclear safety representatives in contractor locations to ensure timely identification of issues • Include mitigation funding for a series of misinterpretations and rework • Implement a rigorous interface control strategy • Require contractor/subcontractor to comply with and participate in Battelle Energy Alliance, LLC Risk Management Program	• Proven federal or contractor capability to provide expert technical oversight

4. BUSINESS AND ACQUISITION APPROACH

4.1 Acquisition Management

The Remote-Handled LLW Disposal Project will implement an acquisition strategy that will be cost effective in meeting DOE's goals, missions, and project objectives.

Battelle Energy Alliance, LLC, as the management and operating contractor at INL, will act as the prime contractor for the project. The INL contract states the following:

> *The INL Contractor shall manage INL-generated LLW and, if directed by DOE, LLW generated by other tenants (e.g., NRF) upon closure of the RWMC LLW disposal operations…LLW management includes development of on/offsite LLW disposal capability and the supporting infrastructure.*

INL has a DOE-approved procurement system with established processes for handling project management, vendor selection, construction management, and equipment procurements. INL will have prime responsibility for technical direction and oversight of all contracts required to execute this project. INL's project management; construction management; and environmental, safety, health, and quality management systems are all proven to be effective for oversight of projects of this scale and type. The project will ensure all applicable conditions and interfaces are described and managed in compliance with DOE Order 413.3B. The following activities will be performed by INL with subcontractor support and DOE-ID oversight:

- Preparation of documents to support CDs
- Preparation of engineering design documentation
- Preparation of NEPA documentation, including a siting study and an environmental assessment
- Preparation and DOE Headquarters approval of a performance assessment and composite analysis
- Preparation of disposal facility waste acceptance criteria
- Preparation of nuclear safety documentation
- Preparation of requests for proposal and performance specifications
- Subcontractor selection and contract administration
- Facility design and construction management
- Operational readiness activities.

These activities will be implemented using readily available materials, equipment, and processes. To the extent practicable, required documentation will build on previous design and analyses for the current disposal capability at RWMC. Management oversight will be accomplished using INL's formal project management structure.

4.2 Acquisition and Contract Approach

The INL Remote-Handled LLW Disposal Project will be implemented using a design-build project delivery method.

The execution of this acquisition approach supports the schedule to meet the mission need to develop replacement remote-handled LLW disposal capability by the end of FY 2017, and aligns with an 18-month budgeting cycle for line item construction project fund requests.

A performance specification will be prepared as part of a proposal package to clearly identify all requirements of the subcontract. The design-build subcontract will be placed using a contract type that will emphasize meeting the requirements of the performance specification. The performance specification will be sufficiently detailed to allow prospective design and construction firm/teams to formulate proposals. The subcontract will require design and construction of the vaults and monitoring wells, an administrative support building, maintenance building, equipment storage areas, and physical security. Utilities, including electrical power connections, potable water, sanitary sewer, fire detection/protection, and telecommunications, also will be required. This design-build subcontract will include costs for associated equipment.

For the transportation component of the project, initial efforts will focus on defining the transport system specifications to ensure that the cask produced fully complies with all quality and safety standards for transportation of waste onsite and has undergone all appropriate testing. New cask transfer and handling equipment for waste from the ATR Complex and MFC will be procured and fabricated.

The overall objective is to control the total cost of the project, align with the line item construction project funding requests with the due budget cycle, and provide uninterrupted remote-handled LLW disposal capability.

The purpose of subcontracting will be to competitively select subcontractors. A bidder's list will be developed and interested firms will submit proposals for evaluation by an INL selection committee appointed for that purpose. The selection process is expected to take approximately 3 to 4 months for each of the project components.

Selection of suppliers will consider technical qualifications in a best value process. The selection will be based on the following:

- Past corporate performance in regard to safety, quality, and environmental
- Recent experience of firms with similar scope and requirements
- Proposed cost, schedule, and past performance of similar scope.

4.3 Contract Types, Incentives, and Small Business Approach

The project will use a design-build approach. Solicitation of the design-build contract will involve the businesses' ability to construct nuclear facilities. As part of the acquisition planning process, INL will assess the need for incentive or award fee provisions for procurement. Incentives will be considered to improve contractor performance above minimum requirements established in the subcontract. Incentives could be linked to such performance metrics as cost, schedule, safety performance indexes, or to exceeding other minimum requirements of the subcontract. INL also will maximize small business utilization to support socioeconomically disadvantaged business.

4.3.1 Interfaces and Integration Requirements

To successfully provide uninterrupted disposal capacity for INL remote-handled LLW, the chosen alternative must be compatible and must interface with facilities, equipment, disposal handling tools, and operating procedures currently in use at RWMC. Continuing use of functional and efficient equipment will reduce cost and simplify and improve safety of disposal operations and associated activities. The primary project interface is via transport casks. The project will work closely with generating facilities to ensure compatibility between any new waste transport system(s) and the concrete disposal vaults.

5. MANAGEMENT STRUCTURE AND APPROACH

5.1 Integrated Project Team

The integrated project team will assist the Federal Project Director in planning, programming, budgeting, and acquisition of needed capital assets. In addition, integrated project team members will work to ensure the project is safely and effectively executed in accordance with DOE requirements and applicable federal and state laws and regulations. The integrated project team is identified in Section 2 of the preliminary project execution plan (DOE-ID 2011).

The cost range of options exceeds the $20M acquisition executive authority delegated to the DOE-ID manager, thereby requiring CD-1 to be approved by the Acquisition Executive, Assistant Secretary for Nuclear Energy. Acquisition executive authority for subsequent CD approval actions will continue to reside with the Acquisition Executive, Assistant Secretary for Nuclear Energy, unless delegated to the DOE-ID manager.

The Federal Project Director functions as the integrated project team leader. In this capacity, the Federal Project Director may delegate responsibility, assign actions, request assistance, and seek advice of the integrated project team members and other subject matter experts. The integrated project team is organized by functional areas. The integrated project team composition and membership will vary, depending on the phase of the project. In their functional capacity, the integrated project team members are authorized to represent their respective organizations in advising the Federal Project Director and providing project oversight.

The DOE-NE Headquarters Program Manager is a participating member of the integrated project team, representing the Acquisition Executive, Assistant Secretary for Nuclear Energy as the project's acquisition executive. A representative of the Naval Reactors Idaho Branch Office participates on the integrated project team in an advisory capacity. The Idaho Branch Office's NRF is the principal generator of remote-handled LLW at INL. The Idaho Branch Office participates on the integrated project team by representing LLW generators that are not managed by Battelle Energy Alliance, LLC.

Timely, safe, and cost-effective completion of the project is the responsibility of the Federal Project Director. However, the Federal Project Director is not authorized to function as the contracting officer's representative. Under the DOE-ID contract management approach; this function is performed by the Assistant Manager for Infrastructure Support. The Federal Project Director functionally reports to the Assistant Manager for Infrastructure Support on this project. The Federal Project Director is authorized to provide oversight consistent with direction provided by the contracting officer.

5.2 Interdependencies and Interfaces

The project will be performed under the sole direction of the Federal Project Director. Battelle Energy Alliance, LLC, as the operating contractor at INL, will be responsible for conducting all activities necessary for design, construction, and operation of the new remote-handled LLW disposal facility, with oversight and direction provided by the Federal Project Director and the integrated project team per the INL contract.

The project will be managed by the INL project team under the oversight of DOE-ID. The INL assigned project manager will be responsible for administration and management of all project activities. The project will be managed, controlled, and reported per INL project management requirements, processes, and guidance documents. Execution of the project will require coordination of both internal (i.e., INL) and external (i.e., subcontract, NRF, and DOE) resources. The project manager will ensure that appropriate and qualified personnel from INL support organizations are assigned to support the project. The project manager will provide regular updates to and interface with the Federal Project Director to ensure that the project is proceeding as planned.

A design-build project delivery method is being used for this project. The INL contractor will have primary responsibility for the integration, coordination, technical direction, and oversight of all activities and contracts required to execute the project. The final design and construction/fabrication activities for the project will be completed by the selected subcontractor(s).

Because a large percentage of the projected remote-handled LLW to be disposed of at the proposed disposal facility will be generated by NRF, close coordination with NRF personnel will be required as the project progresses. Support from NRF will be required in providing updated waste volumes, waste characterization data, and other operations-related information necessary to ensure the new disposal facility meets the waste disposal needs and requirements of NRF to the maximum extent possible. The INL contractor, in coordination with the Federal Project Director, will have primary responsibility for coordinating activities and obtaining necessary information from NRF.

6. RECOMMENDATIONS AND APPROVAL

In 2006, the Office of Science, the National Nuclear Security Administration, and the Department of Homeland Security entered into an agreement to co-fund a $224M Physical Sciences Facility at the Pacific Northwest National Laboratory. This agreement established a precedent for multi-organizational funding of a line item construction project. The terms of the agreement are documented in a memorandum of understanding. A similar approach is being pursued for funding the remote-handled LLW disposal facility. A co-funding arrangement between DOE's NE and NR has been initially agreed to in a memorandum of agreement signed in June 2009[c] by the Principal Deputy Assistant Secretary (Office of Nuclear Energy) and the Deputy Director of Naval Nuclear Propulsion. Although acquisition authority resides with the Acquisition Executive, Assistant Secretary for Nuclear Energy, it is recommended that NR fully participate on the Energy System Acquisition and Approval Board.

This document accurately represents the recommendations of the project's integrated project team to address the full range of project risks and includes evaluation of alternatives available to accomplish the project scope. No barriers or impediments to executing this acquisition strategy, as detailed, exist at this time.

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[c] Memorandum of Agreement Between the Office of Nuclear Energy and the Office of Naval Reactors for the Idaho National Laboratory's Proposed Remote-Handled Low-Level Waste Disposal Facility, June 2009.

The recommended acquisition strategy meets the overall objective of the INL Remote-Handled LLW Disposal Project. It aligns with the line item construction funding requests and integrates the federal budget cycle to provide uninterrupted remote-handled LLW disposal capability.

If new information or facts arise that could significantly impact project cost, schedule, or performance, DOE-ID will make the Program Secretarial Officer and Office of Engineering and Construction Management aware of this on a timely basis.

The acquisition strategy may be modified if deemed prudent. Significant changes will be justified and documented. Changes in contract type, competition, or major milestones must be documented and approved at the same approval level as the original.

7. REFERENCES

40 CFR 61.90–61.97, "National Emission Standards for Emissions of Radionuclides Other than Radon for Department of Energy Facilities," *Code of Federal Regulations*, Office of the Federal Register.

42 USC § 4321 et seq., "National Environmental Policy Act of 1969 (NEPA)," *United States Code.*

42 USC § 7401 et seq., "Congressional Findings and Declaration of Purpose," *United States Code*.

42 USC § 9601 et seq., "Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)," *United States Code.*

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