Department of Energy
Idaho Operations Office
1955 Fremont Avenue
Idaho Falls, ID 83415

February 18, 2009

SUBJECT: Finding of No Significant Impact for the Final Environmental Assessment for the Remote-handled Waste Disposition Project (WDP-RWMC-09-008)

Dear Interested Party:

The U.S. Department of Energy, Idaho Operations Office (DOE-ID) issued a Finding of No Significant Impact (FONSI) for the Final Environmental Assessment for the Remote-handled Waste Disposition Project. The environmental assessment contains the analysis of the potential environmental impacts of processing for disposition approximately 327 cubic meters of remote-handled (RH) waste currently stored at the DOE's Idaho and Hanford Sites. DOE considered four alternatives using different locations and facilities on the Idaho Site for the waste processing activities, and two different waste transportation routes. DOE selected "Alternative 1: INTEC Existing Facilities Alternative." Existing facilities at the INL Idaho Nuclear Technology and Engineering Center (INTEC) will be used to conduct waste processing activities. U.S. Highway 20 was selected for waste transportation. Periodic road closures on Highway 20 will be scheduled and publicized in a manner that will minimize the potential for public inconvenience.

The draft environmental assessment was made available for a 40-day public review and comment period. DOE considered all comments made on the draft assessment before selecting the alternative that best meets the project's purpose and need.

The FONSI is the Department's determination that the selected alternative does not constitute a major federal action significantly affecting the quality of the human environment.

If you have any questions about this notification please contact Chuck Ljungberg, Document Manager for this project at (208) 526-0198, or Jack Depperschmidt, DOE-ID National Environmental Policy Act Compliance Officer, at (208) 526-5053.

Sincerely,

Dennis M. Miotla
Interim Manager

U.S. DEPARTMENT OF ENERGY
FINDING OF NO SIGNIFICANT IMPACT
FOR THE ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED REMOTE-HANDLED WASTE DISPOSITION PROJECT

Agency: U.S. Department of Energy (DOE)

Action: Finding of No Significant Impact (FONSI)

Summary: DOE prepared an Environmental Assessment (EA) for the Proposed Remote-handled Waste Disposition Project. DOE has approximately 322 cubic meters (around 980 containers) of remote-handled (RH) waste stored at the Materials and Fuels Complex (MFC) and the Idaho Nuclear Technology and Engineering Center (INTEC) on the Department of Energy Idaho Site. These RH wastes require further processing before being disposed. A portion of this RH waste is RH transuranic (TRU). The DOE must take action to comply with the Idaho Settlement Agreement and Consent Order (Idaho 1995) mandating that INL TRU waste be shipped out of Idaho by a target date of December 31, 2015, and no later than December 31, 2018. In addition to the INL waste discussed above, the DOE has five cubic meters of RH low-level waste (LLW) located at the DOE Hanford Fast Flux Test Facility (FFTF), which are identified as RH-special components (RH-SCs) that need additional processing prior to disposal. The FFTF waste treatment decision and the associated transportation impacts are being analyzed in the Tank Farm Closure & Waste Management Environmental Impact Statement for the DOE Hanford Site. The impacts of processing them are included in the EA, in case DOE decides to treat those wastes as part of this project.

The proposed action consists of processing the wastes in four phases. Waste processing activities for the first three phases include retrieving and transporting the containers, opening the containers, and characterizing, sizing, and repackaging the waste according to waste classifications. Phases I, II, and III would not include any sodium-contaminated waste or waste comingled with fuel pieces, which are present in the waste inventory. This waste would be processed under Phase IV, using one of the treatment technologies presented in the EA (Section 3.1.2.3).

Four alternatives considering the use of different facilities and locations for the conduct of the proposed actions were analyzed:

- Alternative 1 - INTEC Existing Facilities Alternative (preferred alternative);
- Alternative 2 - MFC/INTEC Existing Facilities Alternative;
- Alternative 3 - INTEC Existing Facility and New Construction at MFC Alternative;
- Alternative 4 - MFC Existing Facilities and New Construction Alternative.

The No Action Alternative, which would leave the waste in the existing storage location at the MFC, was also evaluated.

Two viable "out of commerce" waste transportation route options were evaluated. These included: temporarily closing and using U.S. Highway 20; and using an existing two-track road on the INL referred to as the T-25 Powerline Road.

The draft EA was released for a 40-day public review and comment period on December 19, 2008. DOE received comments from ten members of the public or organizations. DOE responded to those comments and revised portions of the EA, as appropriate.

The EA was prepared in accordance with the Council on Environmental Quality (CEQ) Regulations for implementing the National Environmental Policy Act (NEPA) (40 CFR Parts 1500-1508), and the DOE NEPA Implementing Procedures (10 CFR Part 1021).

Selected Alternative: Alternative 1 – INTEC Existing Facilities Alternative (Preferred Alternative)

Either the hot cells located in the New Waste Calcining Facility (NWCF)(CPP-659) or the Fluorinel Dissolution Process (FDP) Cell located in the Fluorinel Dissolution Process and Fuel Storage (FAST) facility (CPP 666) would be used to perform Phases I, II, III, and IV under Alternative 1, the Preferred Alternative. Modifications to the NWCF cells to support the waste processing actions would be completed as described in Section 3.5.1.2 of the EA. Decontamination and modification would be performed as necessary for use of the FDP Cell as described in Section 3.5.1.3 of the EA to support processing the waste. Two interim storage facilities available at INTEC (CPP-2707 and CPP-749) would be used for the Preferred Alternative.

U.S. Highway 20 is selected for waste transportation. Periodic road closures on Highway 20 will be scheduled and publicized in a manner that will minimize the potential for public inconvenience.

Analysis: Based on the analyses in the EA, the selected alternative would not have, and would likely prevent, a significant effect on the human environment within the meaning of NEPA. The term "significantly" and the significance criteria are defined by the CEQ Regulations for implementing NEPA at 40 CFR Part 1508.27. The significance criteria are addressed below.

1) **Beneficial and adverse impacts** [40 **CFR Section** 1508.27 (b)(l)]: The analysis indicates that there will be no significant impacts from implementing the selected alternative (Section 5.0).

2) **Public health and safety** [40 **CFR Section** 1508.27 (b)(2)]: The analysis indicates emissions of radiological and hazardous air pollutants are small and would not significantly affect public health (Section 5.1.2). The radiological dose to the hypothetical Maximally Exposed Individual is several orders of magnitude less than the dose received from natural background radiation, and well below the applicable standard (40 CFR 61, Subpart H), which limits doses caused by atmospheric releases of radioactivity from a DOE facility to 10 mrem/year. Administrative and engineering controls on facilities used would reduce the impacts from pollutants of concern to levels

that would minimize or eliminate any quantifiable cumulative effect on air quality (Section 5.5).

3) **Unique characteristics of the geographical area** [40 **CFR Section** 1508.27 (b)(3)]:Implementing the selected alternative will not affect any unique characteristics of the area (Section 5.1.). Due to the timing of the field survey work conducted (Fall 2008), the presence or absence of sensitive plant species potentially occurring along the T-25 Powerline road corridor was not able to be determined. This route was not selected for waste transportation, therefore the project will not impact sensitive plant species.

4) **Degree to which effects on the quality of the human environment are likely to become highly controversial** [40 **CFR Section** 1508.27 (b)(4)]: The analysis in the EA indicates implementing the selected alternative will result in no significant effects on the quality of the human environment and extent of public comment indicates that the selected action is not highly controversial.

5) **Uncertain or unknown risks on the human environment** [40 **CFR Section** 1508.27 (b)(5)]: There are no uncertain or unknown risks associated with implementing the selected alternative.

6) **Precedent for future actions** [40 **CFR Section** 1508.27 (b)(6)]:
The selected alternative does not set a precedent for future actions.

7) **Cumulatively significant impacts** [40 **CFR Section** 1508.27 (b)(7)]:
There would be no significant cumulative impacts associated with implementing the selected alternative (Section 5.5).

8) **Effect on cultural or historical resources** [40 **CFR Section** 1508.27 (b)(8)]: The analysis indicates that there will not be any impacts from implementing the selected action and using U.S. Highway 20 for waste transportation. Impacts to cultural resources would have occurred only if the T-25 Powerline Road route (Section 3.1.2.2.2) was selected for waste shipments rather than U.S. Highway 20.

9) **Effect on threatened or endangered species or critical habitat** [40 **CFR Section** 1508.27 (b)(9)1]: The selected alternative would not have an effect on threatened or endangered species or critical habitat (Section 5.1.3.2). No critical habitat for threatened or endangered species, as defined in the Endangered Species Act, exists on the INL site. Impacts to biological resources would have occurred only if the T-25 Powerline Road route (Section 3.1.2.2.2) was selected for waste shipments rather than U.S. Highway 20.

10) **Violation of Federal, State, or Local law** [40 **CFR Section** 1508.27 (b)(10)]:
The selected alternative would not violate any federal, state or local law (Section 6.0).

Determination: Based on the analyses presented in the attached EA, I have determined that the selected alternative does not constitute a major federal action significantly affecting the quality of the human environment. Therefore, preparation of an environmental impact statement is not required.

Issued at Idaho Falls, Idaho on this 18th day of February, 2009.

~~Dennis~~ M. Miotla
Interim Manager, Idaho Operations Office

Copies of the EA and FONSI are available from: Brad Bugger, Office of Public Affairs, Idaho Operations Office, U.S. Department of Energy, 1955 Fremont Ave., Idaho Falls, ID 83415, (208) 526-0833 or the toll free citizen inquiry line at (800) 708-2680.

For further information on the NEPA process, contact: Jack Depperschmidt, NEPA Compliance Officer, Idaho Operations Office, U.S. Department of Energy, 1955 Fremont Ave., Idaho Falls, ID 83415, (208) 526-5053.

DOE/EA-01386

Final
Environmental Assessment
for the
Remote-handled Waste Disposition Project

February 2009

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Final
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TABLES

ACRONYMS

BEA	Battelle Energy Alliance, LLC
CFR	Code of Federal Regulations
CH	contact-handled
DOE	Department of Energy
DOT	Department of Transportation
EDF	Engineering Design File
EA	environmental assessment
EPA	Environmental Protection Agency
ESER	Environmental Surveillance, Education and Research
FAST	Fluorinel Dissolution Process and Fuel Storage
FDP	Fluorinel Dissolution Process
FFTF	Fast Flux Test Facility
GTCC-like	Greater-Than-Class-C-like low-level radioactive waste
HEPA	high-efficiency particulate air
HFEF	Hot Fuel Examination Facility
HWMA	Hazardous Waste Management Act
IDAPA	Idaho Administrative Procedures Act
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
LLW	low-level waste
MEDE	melt-drain-evaporate
MEI	maximally exposed individual
MFC	Materials and Fuels Complex
MLLW	mixed low-level waste
MTRU	mixed transuranic
NaK	sodium-potassium alloy

NCRP	National Council on Radiation Protection
NESHAP	National Emission Standards for Hazardous Air Pollutants
NQA	Nuclear Quality Assurance
NRC	Nuclear Regulatory Commission
NWCF	New Waste Calcining Facility
PM	particulate matter
RCRA	Resource Conservation and Recovery Act
RH	remote-handled
RH-SCs	remote-handled special components
RSWF	Radioactive Scrap and Waste Facility
RTR	real-time radiography
RWMC	Radioactive Waste Management Complex
RWDP	Remote-handled Waste Disposition Project
SNF & INEL EIS	*Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement*
STP	Site Treatment Plan
TRU	transuranic
WIPP	Waste Isolation Pilot Plant

GLOSSARY

as low as reasonably achievable. An approach to radiation protection to control or manage exposures (both individual and collective to the work force and general public) and releases of radioactive material to the environment as low as social, technical, economic, practical, and public-policy considerations permit.

contact-handled waste. Packaged waste with external surface dose rates less than 200 mrem/hr.

curie (Ci). The basic unit used to describe the radioactivity in any material.

defense-related waste. (1) Radioactive waste from any activity performed in whole or in part in support of DOE atomic energy defense activities. Excludes waste under the purview of the Nuclear Regulatory Commission or generated by the commercial nuclear power industry. (2) Nuclear waste derived mostly from the manufacturer of nuclear weapons, weapons-related research programs, the operation of naval reactors, and the decontamination of nuclear weapons production facilities.

Greater-than-Class C low-level waste (GTCC). Low-level radioactive waste with concentrations of *radionuclides* that exceed the limits established by the Nuclear Regulatory Commission for Class C radioactive waste, as defined by section 61.55 of title 10, Code of Federal Regulations.

Greater-than-Class C-like low-level waste (GTCC-like). DOE owned or DOE generated radioactive waste that meets the definition of Greater-than-Class C low-level waste (see above). The use of the term “GTCC-like” does not have the intent or effect of creating a new classification of radioactive waste.

high-level waste. Highly radioactive waste material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid waste derived from such liquid waste that contains fission products in sufficient concentrations, and other highly radioactive material that is determined, consistent with existing law, to require permanent isolation.

isotope. Atoms of a particular element with a unique number of neutrons.

latent cancer fatality. The estimated number of cancer fatalities that may result from exposure to a cancer-causing element. The risk of a latent cancer fatality is estimated by converting radiation doses into possible number of cancer fatalities for an entire exposed population group. The latent cancer fatality numerical value is the chance that the group would experience an additional cancer fatality in the future because of radiation exposure (i.e., otherwise would not occur).

low-level waste (LLW). Radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, by-product material (as defined in Section 11e. (2) of the Atomic Energy Act of 1954, as amended [42 USC § 2011–2259]), or naturally occurring radioactive material.

maximally exposed individual. A hypothetical individual defined to allow dose or dosage comparison with numerical criteria for the public. For this assessment, a hypothetical individual located at the INL Site boundary nearest the affected facility was selected.

mixed waste. Waste that contains both source, special nuclear or by-product material subject to the Atomic Energy Act of 1954, as amended (42 USC § 2011-2259), and a hazardous component subject to the Resource Conservation and Recovery Act (42 USC § 6901).

radioactive waste. Any garbage, refuse, sludge, and other discarded material, including solid, liquid, semisolid, or contained gaseous material, that must be managed for its radioactive content.

radioactivity. The property or characteristic of material to spontaneously disintegrate with the emission of energy in the form of radiation. Approximately 5,000 natural and artificial isotopes have been identified.

radionuclide. A radioactive element characterized according to its atomic mass and atomic number that can be man-made or can occur naturally.

roentgen equivalent, man (rem). A unit of radiation dose equivalent (average background radiation dose is 0.3 rem/yr). The unit of biological dose equal to the product of the absorbed dose in rads; a quality factor, which accounts for the variation in biological effectiveness of different types of radiation; and other modifying factors.

scrap nuclear material. The various forms of nuclear material generated during chemical and mechanical processing, other than recycle material and normal process intermediates, which are unsuitable for continued processing, but all or part of which will be converted to useable material by appropriate recovery operations.

spent nuclear fuel. Fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing.

transuranic (TRU) waste. Radioactive waste that contains more than 100 nanocuries (nCi) of alpha-emitting TRU isotopes per gram of waste, with half-lives greater than 20 years, except for: (1) high-level radioactive waste; (2) waste that the Secretary of Energy has determined, with the concurrence of the Administrator of the Environmental Protection Agency, does not need the degree of isolation required by disposal regulations specified in 40 CFR 191 (2002), or (3) waste that the NRC has approved for disposal on a case-by-case basis in accordance with 10 CFR 61.

waste. Nuclear material residues that have been determined to be uneconomical to recover.

Environmental Assessment for the Remote-handled Waste Disposition Project

1. PURPOSE AND NEED

The U.S. Department of Energy (DOE) has approximately 322 cubic meters (979 containers), of remote-handled (RH) waste stored at the Materials and Fuels Complex (MFC) and the Idaho Nuclear Technology and Engineering Center (INTEC) on the Idaho National Laboratory (INL) Site. These RH wastes require further processing before being disposed. A portion of this RH waste is RH transuranic (TRU). The DOE must take action to comply with the Idaho Settlement Agreement and Consent Order (Idaho 1995) mandating that INL TRU waste be shipped out of Idaho by a target date of December 31, 2015, and no later than December 31, 2018. The DOE is also required to comply with the INL Site Treatment Plan Consent Order (DOE-ID 1995), which defines firm and enforceable actions (near-term milestones) to meet the legal and regulatory storage prohibitions and treatment requirements of the Resource Conservation and Recovery Act (RCRA) (42 USC § 6901), the Hazardous Waste Management Act (HWMA) (Idaho Code § 39-4401), and Federal Facility Compliance Act of 1992 (Public Law 102-386).

The majority of RH waste requiring processing was generated during the 40 years DOE conducted research on defense related activities, advanced nuclear reactor concepts, nuclear safety, and nuclear fuel development at MFC (formerly Argonne National Laboratory-West) and Argonne National Laboratory-East, which is located near Chicago, Illinois. It consists of debris and process waste, such as gloves, tools, steel hardware, and elemental sodium and spent nuclear fuel fragments. The RH waste also consists of process components, such as filters, sump pumps, and drain tanks. Similar waste from MFC and Argonne National Laboratory-East reactor operations and research activities has already been classified as defense related waste and it is anticipated that the waste determination for this waste will result in the same determination (ANL-NT-192).

Processing the RH waste would include disassembling the liners and containers, characterizing; sorting and segregating; chemically treating and reducing the size of the container contents, as necessary; and repackaging to meet the waste acceptance criteria of the designated land disposal site. Because this waste is highly radioactive, all processing activities to prepare it for shipment and disposal must be performed in a heavily shielded, waste processing cell. The cell must be designed to ensure particulate radioactive materials and hazardous constituents are contained, reactive metals are handled safely, and intense radiation fields are shielded.

In April 1995, DOE issued the *Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement* (SNF & INEL EIS) (DOE 1995a). That document addressed DOE's programmatic need for developing appropriate facilities and technologies to manage waste and spent nuclear fuel at the INL Site including waste that requires remote handling. In addition, the environmental impacts were evaluated in Section C.4.6.6, "Remote Mixed Waste Treatment Facility." That section describes a facility for removing and converting sodium and treating other waste from an MFC storage facility, the Radioactive Scrap and Waste Facility (RSWF). It further states that the facility would be designed to meet all requirements for removing sodium metal from the Experimental Breeder Reactor-II components stored at the MFC facility.

In June 1995, DOE issued the Record of Decision for the SNF & INEL EIS (DOE 1995b). A decision regarding this project, "Remote Mixed Waste Treatment Facility" was deferred. Section 3.2.2.3

of the Record of Decision states, “Decisions regarding these projects will be made in the future pending further project definition, funding priorities, or appropriate review under the National Environmental Policy Act.” This environmental assessment (EA) tiers from the SNF & INEL EIS (DOE 1995a) and evaluates the potential environmental impacts of the preferred and alternative actions related to processing the RH waste. This environmental assessment was prepared in accordance with the following requirements:

- National Environmental Policy Act of 1969 (Public Law 91-190; 42 USC § 4321 et seq.), as amended
- Council on Environmental Quality National Environmental Policy Act Regulations (Title 40 Code of Federal Regulations [CFR] Parts 1500–1508)
- DOE National Environmental Policy Act Implementing Regulations (10 CFR 1021)
- DOE Order 451.1B, “National Environmental Policy Act Compliance Program.”

In addition to the INL waste discussed above, the DOE has 5 cubic meters (m^3) of RH mixed low-level waste (MLLW) located at the Hanford’s Fast Flux Test Facility (FFTF), and are identified as RH-special components (RH-SCs) that need additional processing prior to disposal. The FFTF RH-SCs consist of “traps” that were used to maintain the purity of the FFTF sodium coolant. DOE will not decide whether to package and ship this waste to the INL Site for treatment as part of this EA. That decision and associated impacts will be addressed as stated in the Notice of Intent for the Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington (DOE 2006). However, since it is reasonably foreseeable that a decision may be made in the future to send the FFTF RH-SCs (RH-LLW) to INL for treatment, the impacts of managing that waste at the INL Site are included in this EA such that the waste can be treated if it is shipped to INL. The FFTF wastes are mixed wastes that would be covered by the INL Site Treatment Plan (STP), and if a decision is made to bring this waste to INL, the State of Idaho approval and other applicable provisions of the STP would be followed.

This EA will serve as the basis for the determination to issue a finding of no significant impact or to prepare an environmental impact statement.

2. BACKGROUND

2.1 Unique Characteristics of Remote-handled Waste in the Scope of this Environmental Assessment

The radioactive waste in the scope of this EA is characterized as RH because it generates a radiation field greater than 200 mrem/hr at its surface (background radiation in the environment is approximately 0.01 mrem/hr).

In addition to its classification by radiation dose rate, this waste is classified as TRU or low-level waste (LLW) by the type and concentration of radionuclides present (radionuclide composition). The TRU and LLW include a subcategory referred to as Greater-Than-Class C-like (GTCC-like) waste. Using the term “GTCC-like” does not have the intent or effect of creating a new classification of radioactive waste. A portion of the inventory also may contain co-mingled spent nuclear fuel rods. Together these classifications determine how the waste would be segregated and packaged for transportation and disposal, and the type of disposal required, either near surface or geological, based on the degree of isolation required.

The waste may contain constituents considered hazardous because of chemical or physical characteristics such as toxicity, reactivity, ignitability, or corrosivity. When radioactive waste contains hazardous waste, it is called mixed waste. The categories of mixed waste include mixed transuranic (MTRU) and MLLW, which are regulated by the federal Atomic Energy Act (42 USC § 2011-2259), RCRA (42 USC § 6901), and HWMA (Idaho Code § 39-4401).

TRU waste contains isotopes such as plutonium-239 and americium-243, which remain radioactive for tens of thousands of years. These elements are classified as TRU because they have an atomic number greater than uranium. By definition, TRU waste is radioactive waste containing more than 100 nanocuries (3700 becquerels) of alpha-emitting TRU isotopes per gram of waste, with half-lives greater than 20 years. A nanocurie is a unit of measure based on how many atoms of a radioactive substance disintegrate per second. The DOE has constructed the Waste Isolation Pilot Plant (WIPP) as a special geologic disposal facility near Carlsbad, New Mexico, for defense-related contact-handled (CH) TRU waste and RH TRU waste disposal. TRU and most MTRU waste can be disposed of at the WIPP without treatment; however, certain reactive MTRU waste requires treatment before shipment and disposal. At minimum, the RH TRU waste stored at the INL Site will require repackaging before being shipped to the WIPP.

Final disposal for GTCC-like waste is not currently available. DOE published a Notice of Intent on July 23, 2007 (DOE 2007). The Notice of Intent states DOE’s intention to prepare an environmental impact statement for a proposal to establish a disposal facility for GTCC low-level radioactive waste, which will include GTCC-like waste. The GTCC-like waste would be stored on-Site until this facility is established and becomes available.

Final disposal for RH LLW is currently available at the Radioactive Waste Management Complex (RWMC) and the Nevada Test Site. Treatment (non-sodium-contaminated) and disposal of RH MLLW is also currently available at the Nevada Test Site. However, both of these facilities are currently scheduled to be closed or may no longer be available to accept these waste streams within the needed timeframe. Appropriate on-Site or off-Site facilities would be used to dispose of RH LLW and RH MLLW. If no disposal options are available during project operation, the waste would be returned to the RSWF for storage until final disposition is available.

2.2 Remote-handled Waste Inventory and Current Storage Facilities

This section describes the RH waste storage facilities at the INL and Hanford Sites where over 980[a] containers (see Table 1) filled with approximately 327 m^3 of waste[b] are stored. It also details the types of RH waste stored in each facility (chemical and radiological characteristics and container types), and describes the potential waste streams considered for sorting, characterizing, treating, and repackaging under the proposed action. Not all of this waste may require final processing, but is included to fully ascertain the environmental and health effects of proposed and alternative actions.

Table 1. Remote-handled waste stored at the Idaho National Laboratory and Hanford Sites.

Site	No. of Remote-handled Waste Containers
Idaho National Laboratory Site	979
Hanford Site	4
Total	983

2.2.1 Remote-handled Waste Storage at the Idaho National Laboratory Site

The 979 containers (approximately 322 m^3) of RH waste are stored at MFC and INTEC facilities at the INL Site. Table 2 shows the total number of waste containers currently stored at each facility.

Waste stored at the INL Site must be characterized, sorted and segregated, and treated as necessary and or repackaged in a remote-handling facility to prepare it for final disposal (see Section 2.1). Treatment and repackaging requirements are set forth in State of Idaho and federal hazardous waste and mixed waste regulations and legal agreements (see Section 1.)

Table 2. Remote-handled waste stored at the Idaho National Laboratory Site.

Facility	No. of Remote-handled Waste Containers
Materials and Fuels Complex	949
Idaho Nuclear Technology and Engineering Center	30
Total	979

2.2.1.1 Remote-handled Waste Storage at Materials and Fuels Complex. The 949 containers (approximately 317 m^3) of RH waste at MFC are stored in the RSWF and other miscellaneous storage facilities. Table 3 summarizes the quantity of waste stored at the MFC facilities.

Radiological surveys indicate that radiation fields from almost all RH waste in these MFC facilities exceed 200 mrem/hr at contact by an order of magnitude. A few containers produce substantially higher radiation fields, up to 14,000 rem/hr. Safe handling requires thick shielding with dense materials (e.g., lead, concrete, and steel) to protect workers who handle the materials from harmful amounts of penetrating radiation.

Table 3. Remote-handled waste stored at the Materials and Fuels Complex.

Facility	No. of Remote-handled Waste Containers
Radioactive Scrap and Waste Facility	924
Miscellaneous Storage Facilities	25
Total	949

a. This number represents the number of containers that may be transferred into the facility for either or both repackaging and treatment before final land disposal.

b. Actual net volumes of remote-handled waste will be identified in future waste stream documents. This estimate is based on information provided to date (December 2008).

2.2.1.2 Remote-handled Waste Storage at Radioactive Scrap and Waste Facility.

Approximately 924 containers (approximately 300 m^3) of RH waste and spent nuclear fuel are stored at the RSWF, a 4-acre fenced plot of land (see Figure 1). The waste containers are in liners, which are sealed carbon-steel pipes and buried vertically, with the top of the liners protruding above ground by several inches. In some cases, the inner containers would be removed from the liners and maintained separately. In other cases, the liners and their contents would have to be removed from the ground and managed as the waste package. In this case, the liner becomes the container. In this EA, the waste packages, inner containers, and removed liners are referred to as *containers* and the in-ground storage vaults are referred to as *liners* (see Figure 2).

Figure 1. Remote-handled waste storage at Radioactive Scrap and Waste Facility.

The waste stored at RSWF consists of sodium-contaminated and nonsodium-contaminated TRU, MTRU, LLW, MLLW, and GTCC-like waste and spent nuclear fuel material. Before 1992, these materials were often co-mingled within the same container. The radiological inventory primarily consists of uranium, plutonium, other TRU isotopes, and shorter-lived isotopes such as cesium and cobalt. The hazardous constituents in the waste primarily consist of reactive metals (sodium and sodium-potassium alloy), which are categorized as reactive and ignitable, making the waste difficult to handle and treat. Ignitability depends on such variables as temperature, humidity, exposure to moisture, and the physical form of the material. Also, some of the material is contaminated with other hazardous components (e.g., toxic metals). The waste containers at RSWF primarily are filled with debris that emits a higher radiation field than the RH waste stored at other MFC facilities. Each container holds one or more of the following: steel cans, sodium/sodium-potassium alloy, process compactables, spent nuclear fuel assemblies, steel liners, steel hardware, gravel, lead shield plugs, toxic metals, and process components (ANL-W 2004). This waste originated from operations of three major hot-cell facilities at MFC and Experimental Breeder Reactors-I and –II as well as Argonne National Laboratory-East.

Through the years, four different liner sizes and inner container configurations have been used to safely store waste at RSWF (see Figure 2). These liners are fabricated from carbon steel and protected from corrosion by a cathodic protection system (the first-generation liners were not cathodically protected). Smaller individual containers of waste (referred to as canisters or cans) are lowered into the liners from a transfer cask. Then a lid/shield plug assembly is installed in the top of the liner. The soil provides radiation shielding, which, in conjunction with the radiation shield plug, provides the shielding to meet radiological exposure requirements. Before 1978, the smaller waste containers were not designed to be removed from the liners to access waste.

The first type of liner (see Figure 2A) and inner container configuration used to store waste at RSWF is referred to as a first-generation liner. These liners are 16 in. in diameter, 12.4 ft long, and filled with waste loaded into thin-walled inner containers known as “paint cans.” All of these paint cans were dropped into the liners and most were covered with gravel to provide radiation shielding. It is assumed that some of the paint cans ruptured when dropped because of their thin walls and the fact they were loaded with up to 1,000 lb of steel components. These first-generation liners were not cathodically protected, which resulted in severe corrosion. In the worst cases, corrosion caused perforation of some of the liners. Beginning in 1990, as a result of the potential for breaching, the first-generation liners were overpacked into new 24-in.-diameter, 13.67-ft-long, cathodically protected liners. Figure 2A illustrates a paint can within a 16-in.-diameter liner overpacked in a 24-in.-diameter liner.

The second type of liner and inner container configuration used at RSWF consists of a cathodically protected 16-in.- diameter, 12.4-ft-long carbon-steel tube filled with waste in a double-walled container known as the Hot Fuel Examination Facility (HFEF)-5 can assembly (see Figure 2B). The HFEF-5 can assembly was lowered by a crane into the liner, and the lid/shield plug assembly was installed on top of the liner. Figure 2B shows the HFEF-5 can within a 16-in.-diameter liner.

The third type of liner is a 26-in.-diameter, 12.33-ft-long cathodically protected carbon-steel liner loaded with a container known as the Sodium Loop Safety Facility can. Figure 2C shows a Sodium Loop Safety Facility can within a 26-in.-diameter liner.

The remaining liners, which are loaded with waste, are referred to as nonstandard. These liners, which range in diameter from 30 to 60 in., contain large process components, such as cold traps and nuclide traps. Figure 2D shows the 60-in.-diameter liner with an Experimental Breeder Reactor-II primary cold trap.

2.2.1.3 Remote-handled Waste Storage at Materials and Fuels Complex Buildings. Currently, seven waste containers (approximately 6 m^3) are stored in the Sodium Components Maintenance Shop. The containers, called cold traps, removed impurities from the Experiment Breeder Reactor-II sodium systems. Although the containers are shielded to reduce the surface radiation field to CH levels (less than 200 mrem/hr), the waste inside is RH. An additional 18 waste containers (approximately 11 m^3) are in storage at other miscellaneous facilities located at MFC. This waste includes filters, debris, sludge, light bulbs, and analytical laboratory waste. Waste types vary, and include MTRU, TRU, and MLLW.

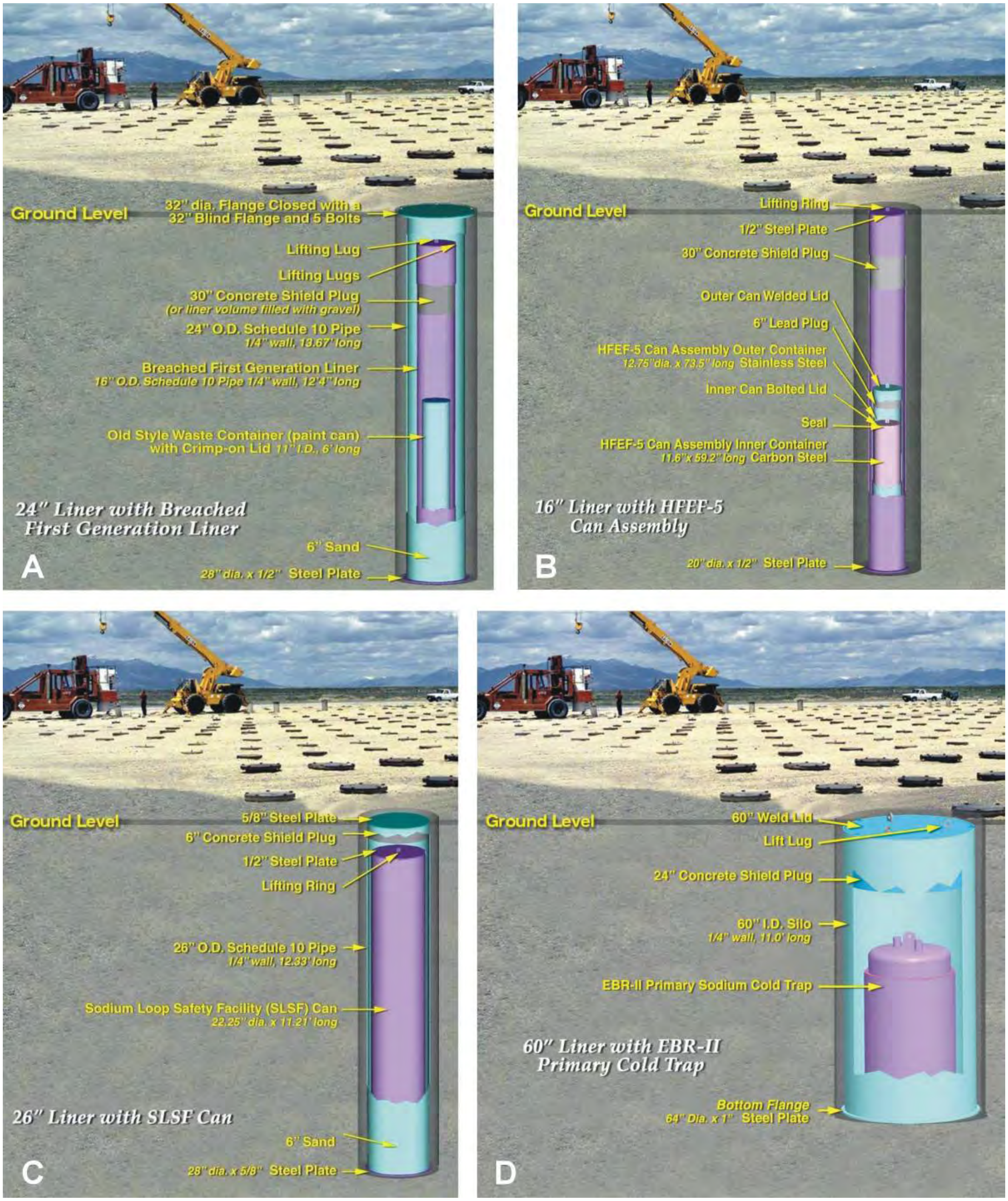

Figure 2. Radioactive Scrap and Waste Facility storage liner configurations.

2.2.1.4 Idaho Nuclear Technology and Engineering Center Interim Storage Facility.

Thirty waste containers (approximately 5 m^3) are stored at INTEC in CPP-1789, which is located southeast of CPP-1617. CPP-1789 is a fenced asphalt/concrete pad, approximately 154 ft by 194 ft, located inside the INTEC facility fence near the southwest corner of the INTEC area. The 30 HFEF-5 cans, referred to as inserts, are stored in interim storage containers that can each hold up to four HFEF-5 cans. The HFEF-5 cans would remain in the interim storage containers at CPP-1789 until they are processed.

The waste in the 30 HFEF-5 cans was generated from destructive examination of fuel elements irradiated in the Experimental Breeder Reactor-II reactor. The waste consisted of laboratory equipment and disposable material contaminated with radioactive material during the destructive examination, but did not include the fuel elements themselves.

2.2.2 Remote-handled Waste Storage at the Hanford Site

Six special components, four "traps" and two filter traps, are located in-cell in the FFTF at the Hanford Site. They are referred to as the Special Components because they may have high radiation fields requiring either or both shielding and special handling and are expected to contain large quantities of sodium. In addition, they are large and heavy, and, therefore a challenge to remove, package, store, ship, and process.

The dimensions and weight of the traps are summarized in Table 4, but may not represent the actual size of the components as cut from the cells in the facility. The final dimensions depend on the procedures used to remove and package these components. A primary goal of the procedures is to minimize the overall dimensions by cutting and capping piping close to the components and removing attached material, such as trace heaters and insulation.

Table 4. Fast Flux Test Facility special component dimensions and weights.

Component Number	Name/Function	Dimensions (Approximate)	Weight[a] (Estimated) lb
N-5	Primary Cold Trap	103 in. long by 61 in. diameter	16,000
N-3	Cesium Trap	77 in. long by 56 in. diameter Crystallizer tank diameter = 20 in.	2,000
U-527[b]	5 scfm[c] Condenser Vapor Trap (Type I)	Assembly minus preheater length = 100 in. Width across flanges = 42 in. Tank diameter = 30 in.	4,850
U-532[b]	1 scfm Condenser Vapor Trap (Type II)	61 in. long by 20 in. across mounting flanges Tank diameter = 10.75 in.	575
VT-63, VT-64	U-527 Filter Vapor Trap Type I, 58 ft^2	82 in. long by 25 in. diameter across mounting flanges	665
VT-61, VT-62	U-532 Filter Vapor Trap Type II, 15 ft^2	35 in. long by 19 in. across mounting flanges	241

a. Weights are as manufactured without sodium or added structure, pipe, trace, heat, and insulation.
b. Each Condenser Vapor Trap has two associated filters.
c. scfm = standard cubic feet per minute

The function of the Primary Cold Trap was to remove sodium oxide and sodium hydride impurities from the sodium coolant. The Cesium Trap was installed to remove cesium from the primary sodium known to have escaped from fuel pin "leakers" during reactor operation. The sodium vapor trap consists of a condenser vapor trap followed by a pair of filter vapor traps (one on-line and a spare). Preceding the condenser is a high temperature section of piping called a preheater, which heats the sodium from an aerosol form and converts it to a vapor. The condenser unit works by cooling the gas and condensing the sodium on to a borosilicate glass medium called "Raschig rings." The condensed sodium flows back to the original sodium pool. The filter vapor trap has sintered metal media and catches any re-entrained aerosol.

3. PROPOSED ACTION AND ALTERNATIVES

The DOE developed selection criteria to determine potential alternatives that would meet its purpose and need identified in Section 1. The following is a list of those selection criteria:

- The alternative must allow for complete processing and shipping of TRU/MTRU waste by a target date of December 31, 2015, and no later than December 31, 2018, based on the court-approved 1995 Settlement Agreement (Idaho 1995)
- The alternative must ensure containment of particulate radioactive materials and hazardous constituents, safe handling and passivation of reactive metals, and minimize worker exposure from intense radiation fields
- The facility must be located near existing utilities not scheduled for removal before 2018
- The alternative must minimize schedule impacts caused by transportation
- The alternative must not impact other DOE programmatic and operational activities
- The alternative must result in final waste forms that meet transportation and disposal requirements.

These criteria provided the basis for determining the alternatives considered and analyzed, which include:

Alternative 1 - INTEC Existing Facilities Alternative (Preferred Alternative)
Alternative 2 - MFC/INTEC Existing Facilities Alternative
Alternative 3 - INTEC Existing Facility and New Construction at MFC Alternative
Alternative 4 - MFC Existing Facilities and New Construction Alternative

The No Action Alternative and eliminated alternatives are also discussed in this section. The two eliminated alternatives were considered, but not analyzed (see Section 3.3).

3.1 Description of Proposed Action

3.1.1 Waste Processing Phases

The waste would likely be processed in four phases. Waste processing activities for the first three phases include receiving retrieved containers, opening the containers, removing the shield plugs, and removing filler material to expose the waste. The final processing step would characterize, size, and repackage the waste as RH or CH LLW, MLLW, TRU, or GTCC-like waste. Phases I, II, and III would not include any sodium-contaminated waste or waste comingled with fuel pieces. This waste would be processed under Phase IV. A description of each phase follows:

<u>Phase I</u>: Move the 30 HFEF-5 cans of TRU waste currently stored at the INTEC Interim Storage Facility to a hot cell. Waste processing activities include receiving retrieved containers, opening the containers, and removing shield plugs and filler material to expose the waste. Real-time radiography (RTR), waste sampling, sizing, and waste repackaging would be performed. These activities would support waste certification for disposal at WIPP if determined to be defense-related waste. Shipment of the waste to WIPP would complete the phase.

<u>Phase II</u>: Phase II activities would include the processing of 44 HFEF-5 cans stored at the RSWF that do not contain sodium or sodium-contaminated components and that are not comingled with fuel pieces.

Most of this waste is TRU, but other waste streams may be encountered (such as MTRU) or generated through processing. The waste would be processed similarly to Phase I to support waste certification for disposal at WIPP.

Phase III: This phase would be similar to the previous two; however, MLLW, TRU and MTRU waste would be addressed in this phase and the waste would not necessarily be stored in HFEF-5 cans. This waste stream may be stored in 18 standard waste containers. Like Phase II, waste consists of TRU and MTRU, but consists of waste from other miscellaneous MFC facilities. Because the waste may contain hazardous constituents (see description in Section 2.2.1.3), TRU and MTRU waste would be segregated prior to repackaging for certification for WIPP disposal if determined to be defense-related waste.

MLLW would be repackaged for shipment to an off-Site treatment, storage, and disposal facility, as the hot cells are not permitted for the treatment(s) necessary to make this waste compliant with land disposal restriction standards. If commercial treatment is unavailable at the time waste is repackaged, the waste would be returned to MFC to be stored until the required treatment becomes available. The MLLW would be tracked in the INL Site Treatment Plan (INL 2008) until it is shipped off-Site for treatment.

Phase IV: Retrieve remaining waste containers currently in storage (approximately 880) at the RSWF and seven standard waste containers from miscellaneous storage facilities (see description in Section 2.2.1.2). This phase could also include processing of the RH-SCs from FFTF and this waste may contain sodium and be comingled with fuel pieces. Transport the waste to a cell for processing for disposition at WIPP if determined to be defense-related waste. Refer to Section 2.1 for a discussion of the disposal paths for all waste types.

The timing of the phases would depend upon the availability of resources, funding, waste disposition opportunities, or other factors. DOE presented the project in a four-phased approach to clearly show discreet activities and not to imply that the phases must be accomplished in sequence. The environmental consequences described in Section 5 remain the same regardless of when each phase is accomplished.

3.1.2 Waste Processing Steps

To satisfy the complete processing of TRU/MTRU waste by the target date, the following actions would be performed under any of the alternatives except the No Action Alternative.

3.1.2.1 Retrieval. Most waste addressed in this action is stored at MFC. Most waste containers at MFC are stored in the RSWF, as discussed in Section 2.2.1.2. Retrieval actions would be performed by facility personnel and include the following steps:

1. Retrieve waste containers using a backhoe, crane, forklift, and transfer cask (see Figure 3)
2. Ensure containers meet the Remote-handled Waste Disposition Project (RWDP) Waste Acceptance Criteria
3. Load containers into shipping package/system
4. Close waste package/system in accordance with applicable procedures
5. Load package/system onto transport vehicle.

Facilities may be constructed at or near the RSWF to perform the above-listed steps. Figure 4 shows the location of the proposed facilities as well as the functions they would support. The facilities may also provide interim storage to support waste retrieval and transportation. Additional interim storage could be placed in the center, i.e., the BB row of the RSWF, where currently, there are no storage liners (see Figure 4). Along with the new liners, concrete tracks could be placed in selected areas and within some of the rows of waste stored in the RSWF. The tracks would allow a backhoe, forklift (see Figure 3), and other similar equipment to continue retrieval operations during wet weather, which could otherwise create soil conditions unable to support the equipment's weight.

Figure 3. Forklift and cask.

If the hot cells at INTEC are used to perform the proposed action, the existing available RSWF roadway may not accommodate the transport trucks. Therefore, the following modifications would be required. Approximately 1 mile of existing roads would be improved to accommodate the large transport trucks. The road from the northeastern corner of the RSWF to the paved road that intersects with the MFC access road (see Figure 5) would require improvement. Improvements would include leveling and widening the road, as well as constructing bridges to withstand the weight and prevent damage to existing buried utilities. The modifications described in this section would be within previously disturbed areas. The modifications would minimize costs and impacts of transportation and ensure process efficiency.

3.1.2.2 Transportation. The following transportation information would apply to the waste requiring transporting from one facility to the other, but would not apply if the waste is transferred within a facility. When transporting radioactive waste on a DOE site, two options are available. The first option is an "in-commerce" shipment that complies with all applicable Department of Transportation (DOT) regulations. This would mean that the material would be moved in a Nuclear Regulatory Commission (NRC) or DOE cask licensed for Type B radioactive materials. Additionally, all applicable radiation protection and emergency response requirements would be met.

In some instances, full compliance with DOT or NRC regulations is impossible (oversized loads) or impracticable (unavailability of casks) when transporting radioactive materials on a DOE site. In such cases, an equivalent level of safety is achieved by using alternate engineering or administrative controls to protect the public and workers. The shipment is taken "out of commerce" by blocking public access, providing security escorts, and adding radiation shielding, as needed. These shipments are called nonroutine shipments and undergo an extensive safety analysis and review process to ensure proper safety plans are developed and implemented. Nonroutine shipments are transported using a Transport Plan which is an addenda to PRD-310, "INL Site Transportation Safety Document (TSD)" required by 10 CFR 830.

3.1.2.2.1 In-Commerce Shipments—An extensive search of the available casks has revealed no NRC or DOE licensed casks that meet the configuration requirements of the RH waste discussed in this document. Therefore, to transport this waste as a compliant, in-commerce shipment, the project would have to design and build a cask. Based on previous industry experience, it is estimated to take from three to four years to design, build, and license a new cask for in-commerce shipments. This timeframe is impractical for in-commerce shipments of INL waste.

The RH-SC waste stored at the Hanford Site FFTF would be shipped in-commerce from FFTF to a hot cell at INTEC or at MFC using NRC-licensed casks.

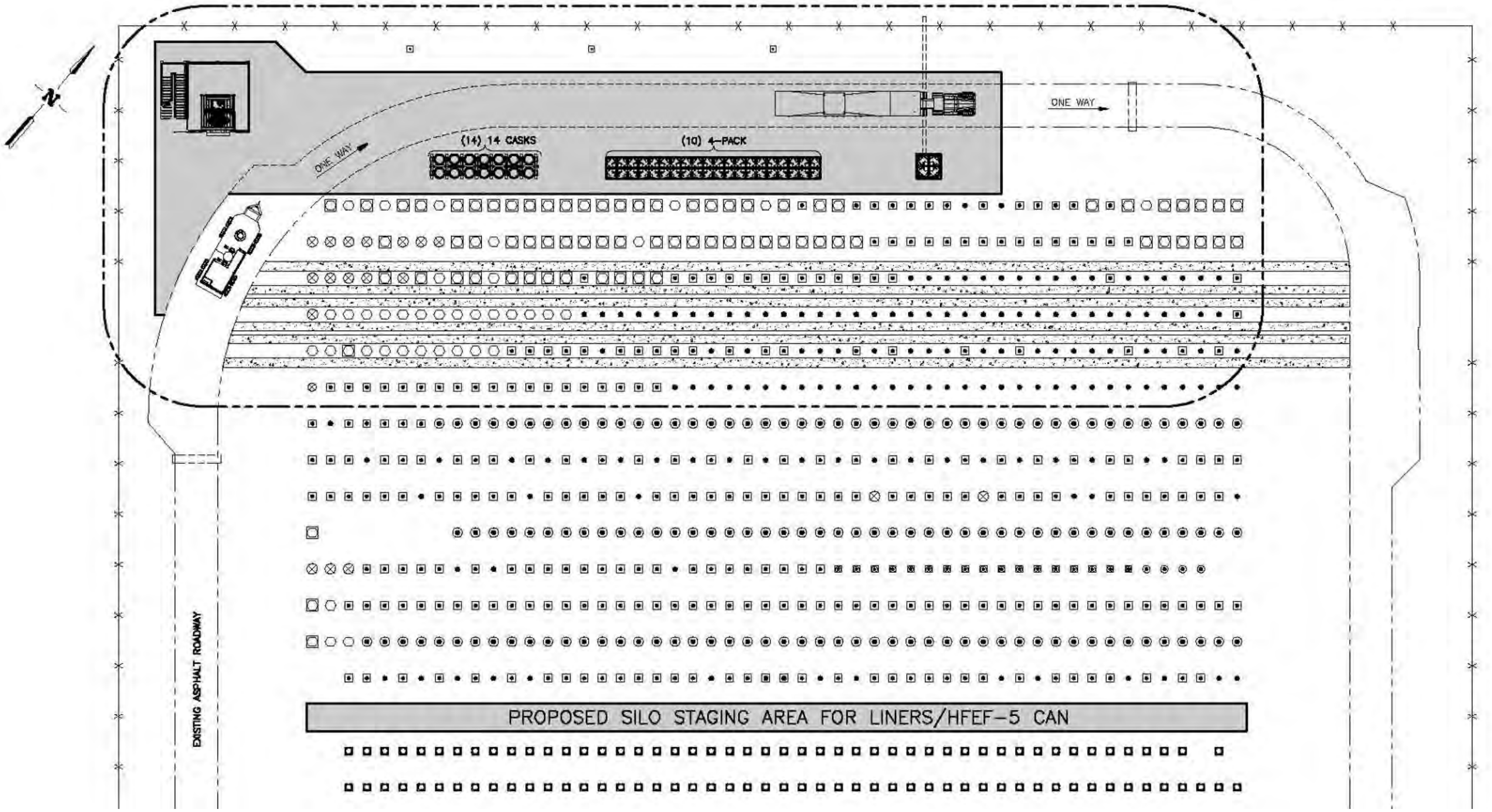

Figure 4. Radioactive Scrap and Waste Facility with proposed interim storage facilities.

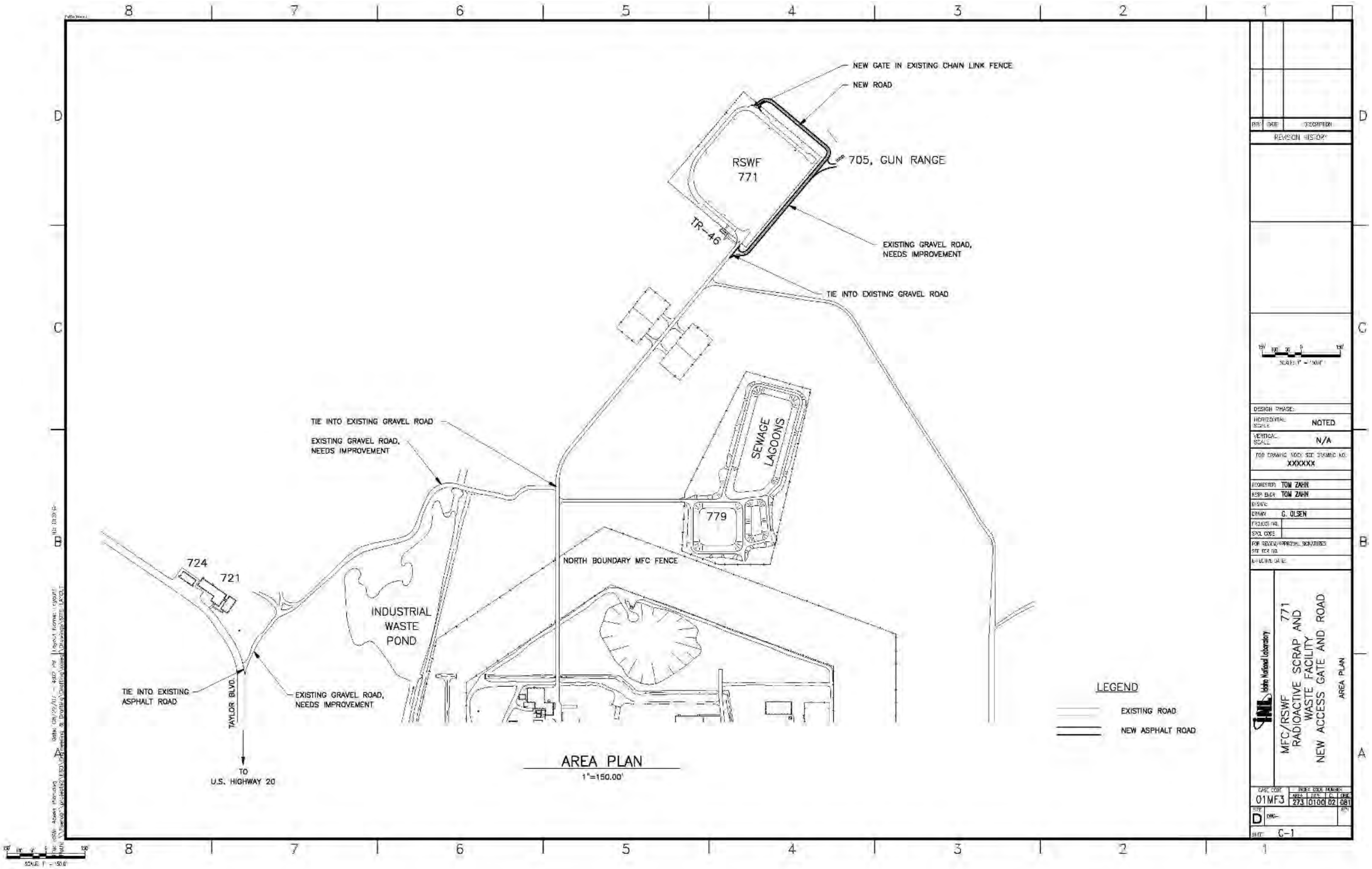

Figure 5. Existing roads requiring improvements near the Radioactive Scrap and Waste Facility.

3.1.2.2.2 Out-of-Commerce (Nonroutine) Shipments—Out-of-commerce shipments would likely be used to transport waste from MFC to INTEC or from INTEC to MFC. It is also likely the HFEF-5 canisters would be shipped using a cask that would hold four canisters per shipment. Should U.S. Highway 20 be used, access would be restricted by blocking U.S. Highway 20 east of the entrance to MFC and west of the U.S. Highway 20 and Fillmore Boulevard or the East Portland Avenue intersection (see Figure 6). The shipments would be escorted by INL security guards from MFC to Fillmore Boulevard or East Portland Avenue via U.S. Highway 20 and then generally north to INTEC via on-Site roads that are restricted from public access. Closure of the public portion of the highway would be communicated and coordinated with the Idaho DOT.

Typically, the road would be closed less than 1 hour. To minimize impact to the traveling public, the road would be closed between 12:01 a.m. and 5:00 a.m. when traffic is lightest. However, occasional daytime transports may be necessary to support project needs or accommodate inclement weather.

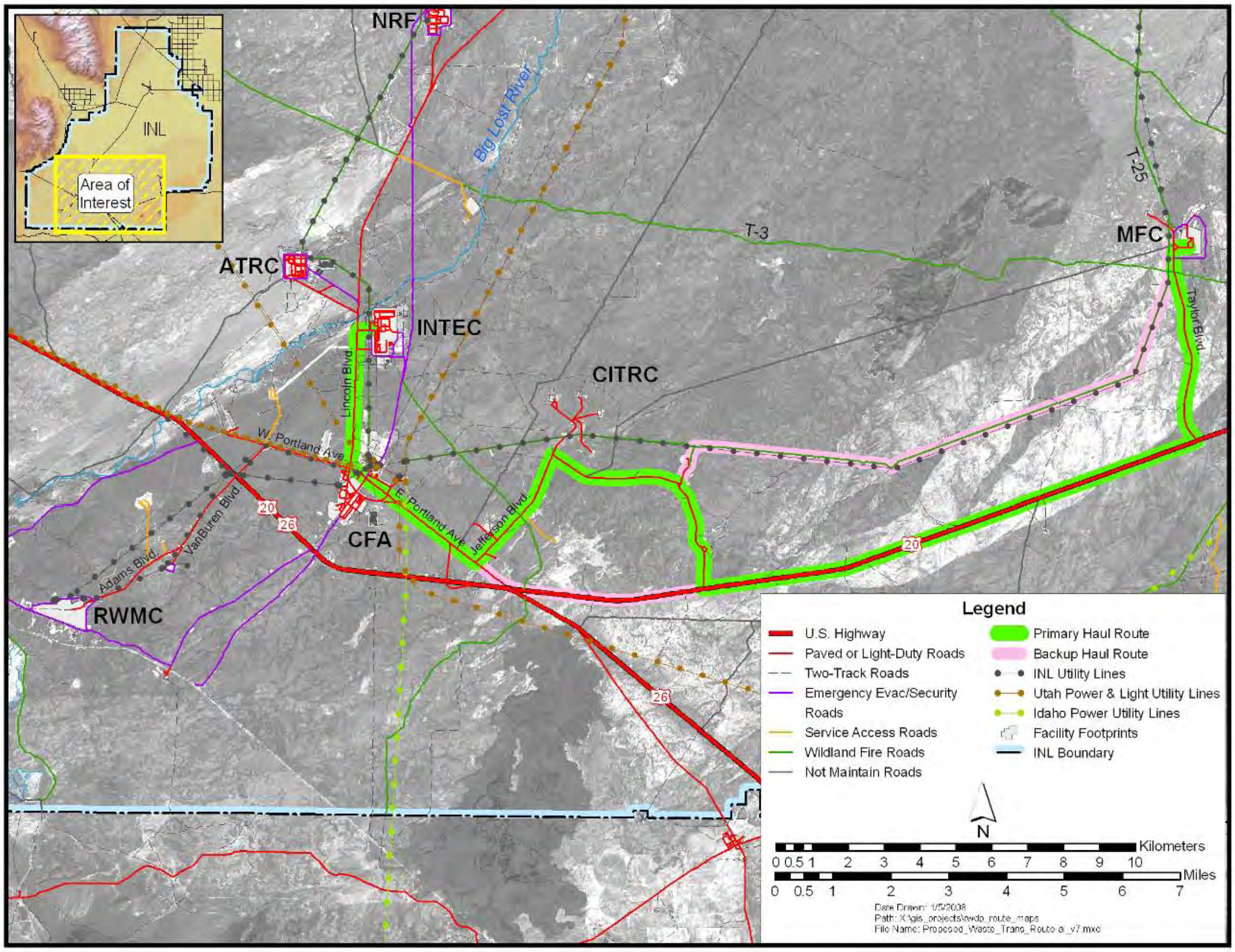

Figure 6. Transportation routes from the Materials and Fuels Complex to Idaho Nuclear Technology and Engineering Center.

New shielded shipping casks would provide transportation flexibility. The cask would provide sufficient shielding to protect workers. These casks could be built and designed to interface with the RSWF storage area and the hot cell. The following is an example of the process: fabricate 15 shielded shipping casks, five casks would be used for a loaded convoy of RH TRU containers, while five would be returned as empty, leaving five available for temporary interim storage.

Nonroutine waste shipments could also be accomplished using an existing two-track road, the East Powerline Loop Road. (Hereinafter, this road is referred to as T-25 Powerline Road.) The T-25 Powerline Road route would begin at pavement on Taylor Boulevard, the main access road to MFC. From there, the route would follow along a short, 0.10 mile-long stretch of trail T-3 until the T-25 Powerline Road is reached. The route would then turn southwest along the T-25 Powerline Road, meandering along on either side and under the lines to the west-southwest approximately 9.90 miles. At this point, the route would leave the T-25 Powerline Road and follow another existing gravel road south approximately 0.40 mile to connect to rough pavement on Fillmore Boulevard at the Auxiliary Reactor Area-IV Facility (see Figure 6).

The T-25 Powerline Road is classified as a two-track Priority 3 road. A Priority 3 road is maintained as passable (but not graded) to 4 × 4 vehicles for wildland fire access and maintenance on the power lines that run through the INL. The road is used seasonally so there is no snow removal. Maintaining Priority 3 roads consists of filling pot holes by dumping gravel fill material in holes or ruts and leveling and compacting the fill by driving back and forth over the new material with the dump vehicle or using hand tools, as necessary. Should the T-25 Powerline Road be used to support the proposed action, it would require modification and upgrades (described below). The upgraded road would be classified as a Priority 2 road. Priority 2 roads are upgraded to support a project. The project would determine what would need to be done to the road to support their intended use. To support the waste shipments described in this document, the actions described below would be required for the initial use. The road would be used from late spring to late fall, with no snow removal. After a heavy-snow season, sections of the road may require grading and filling for the next series of shipments.

To support the waste transportation, extensive improvements would be necessary along this route. All sections of the existing road would require grading, leveling, graveling, and compaction. In addition, some of the more pronounced curves along the route would need to be straightened out. This may require blasting of basalt bedrock. Low areas and steeper hills would require extensive fill to create grades that are suitable and safe for the waste transports. Drainage channels and culverts would be necessary in some places. The width of the upgraded surface would be approximately 25 ft, with road shoulders of varying widths between 10 – 20 ft, depending on the final design and grade. Final design would be completed if this route is selected. In the interim, to assess the potential impacts of the road improvements, it has been assumed that a 120-ft-wide corridor would accommodate all of the necessary upgrade activities.

If the T-25 Powerline Road was upgraded to provide an optional route for shipment of waste to support the RWDP, other projects may choose to use it as their transportation route. Some examples of potential future use of the T-25 Powerline road include:

- Transport neptunium oxide targets from MFC to Reactor Technology Complex for irradiation. Return of the targets to MFC for processing.
- Transport special nuclear materials from MFC to INTEC
- National Security actions.

This additional future use of the T-25 Powerline Road could add approximately 450 trips per year.

3.1.2.3 Waste Processing. The process equipment systems to support processing activities in the cell are discussed in the following subsections in the sequence that the waste materials would be handled. Figure 7 shows a waste process flow diagram.

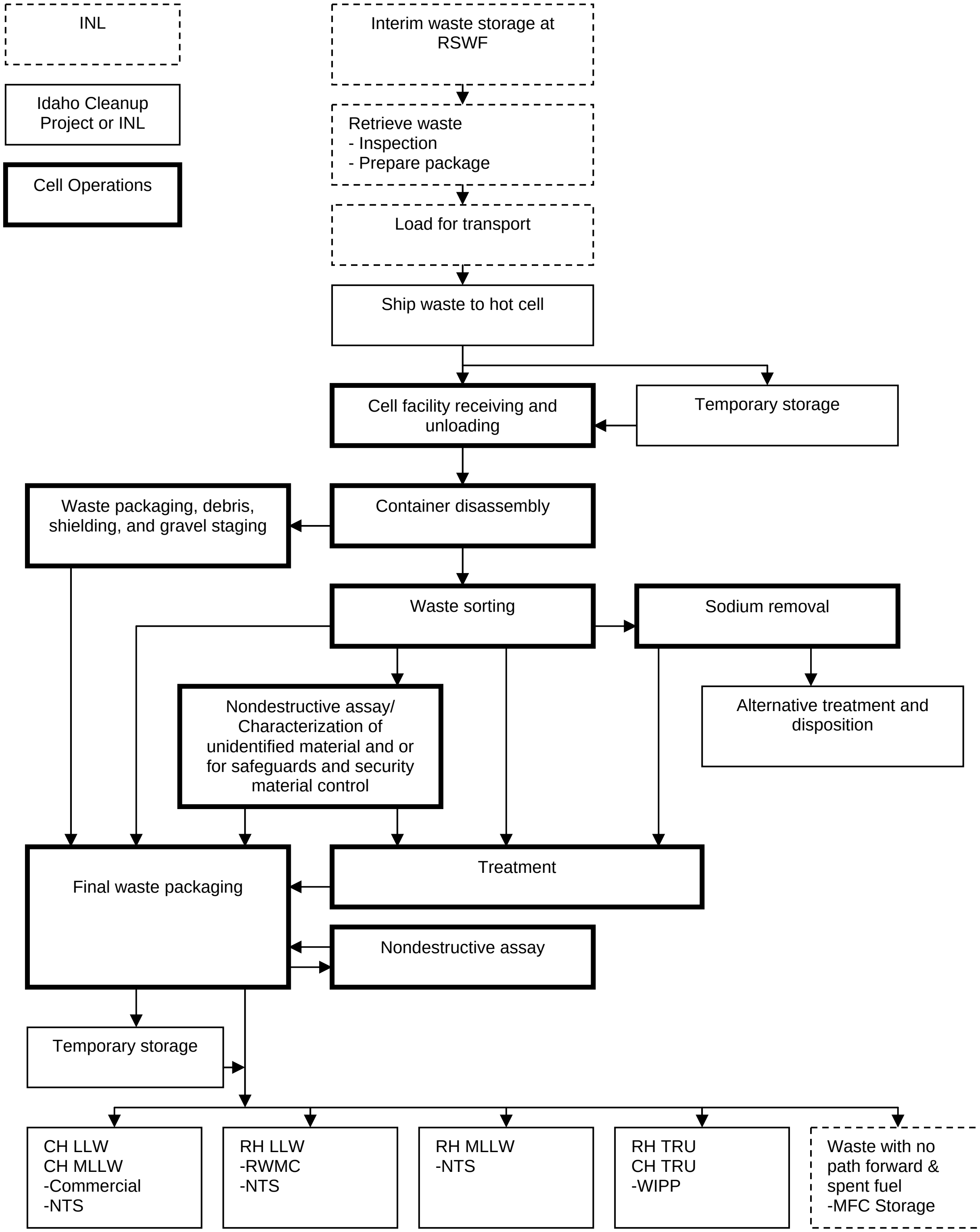

Figure 7. Remote-handled Waste Disposition Project waste flow diagram.

The Container Disassembly and Sorting Station would be located within the cell and used to receive retrieved containers and open the containers, remove shield plugs, and remove filler material to expose fuel or waste. The container and packaging material is anticipated to be sorted as LLW. Once fuel or waste in the inner canister is exposed, the material would be sorted into fuel and nonfuel components, and sodium-contaminated waste would be segregated from other waste. Sodium-contaminated waste would be sent to a processing system within the cell for sodium removal and processing. Any spent fuel would be packaged and placed back in storage at RSWF. The remaining waste would be characterized and sorted as RH or CH LLW, MLLW, TRU, or GTCC-like waste. If the waste is MLLW, it would be treated to land disposal restriction standards, packaged, and shipped to its appropriate disposal site. If treatment or disposal is unavailable at the time that the waste is repackaged, the waste would be returned to MFC to be stored until treatment or disposal becomes available. Figure 7 shows the available disposal sites for each waste stream.

Sodium is ignitable and reactive, which are hazardous characteristics under RCRA regulations. Sodium-contaminated waste components, which exhibit the characteristic of ignitability Environmental Protection Agency ([EPA] Hazardous Waste Number D001) and reactivity (EPA Hazardous Waste Number D003), may not be directly disposed without treating or removing the sodium. Much of the waste is expected to have limited (i.e., residual) quantities of sodium or sodium-potassium alloy (NaK), while only a few of the waste containers contain large quantities of sodium or NaK. Waste components containing sodium or NaK may be effectively treated by direct sodium deactivation using one of the following technologies or a similar technology.

(1) Water Vapor Nitrogen. The water vapor nitrogen process would be conducted in an inert environment (e.g., nitrogen) using a controlled amount of water vapor or water mists and sprays to react with the sodium metal. The water-sodium reaction in an inert environment will form sodium hydroxide and hydrogen. Hydrogen evolution would be monitored and maintained well below the lower explosive limit by controlling the amount of water available to react with the residual sodium. Hydrogen concentration in the off-gas may also be used to determine that the residual sodium has been treated effectively. The sodium hydroxide waste stream resulting from this process would be subsequently neutralized and solidified to meet disposal criteria as LLW. Figure 8 shows a typical process flow for this system.

(2) Larger quantities of sodium or NaK are more difficult to treat using direct sodium deactivation methods. Because sodium metal has a low melting point (97ºC), a low temperature melting process (e.g., melt-drain) may be used to remove larger quantities of sodium from the waste component. NaK, which is liquid at ambient conditions, may also be collected with the liquid sodium for subsequent treatment. Following the melt-drain process, waste components subsequently may be treated with the water vapor nitrogen or similar process to verify any residual sodium or NaK has been treated and the waste component is acceptable for packaging and disposition.

Sodium and NaK collected during the melt-drain process also may be deactivated by using the water-sodium reaction (e.g., the water vapor nitrogen process). The sodium hydroxide waste stream resulting from this process would be subsequently neutralized and solidified to meet disposal criteria as LLW.

(3) Another technology that could be used for treating waste that contains sodium or NaK would be the melt-drain-evaporate (MEDE**)** process. The principal function of the MEDE process equipment would be to remove sodium from RH waste containing sodium metal. The major components of the MEDE system are the furnace, process vessel, condenser and collection tank, and vacuum pump. The sodium would be melted, evaporated under vacuum, recondensed, and accumulated in a holding container. Once the sodium has been separated from the waste, the waste material would be sorted as a nonsodium-

contaminated waste. To treat the elemental sodium extracted by the MEDE process, it is anticipated that an existing MFC facilities, the Sodium Process Facility and or the Sodium Component and Maintenance Shop, would be used.

(4) A Variation of the Water Vapor Nitrogen technology that could be applied is using high-temperature, super-heated steam to react with sodium in an inert atmosphere. The resulting sodium hydroxide would be neutralized and then solidified for disposal.

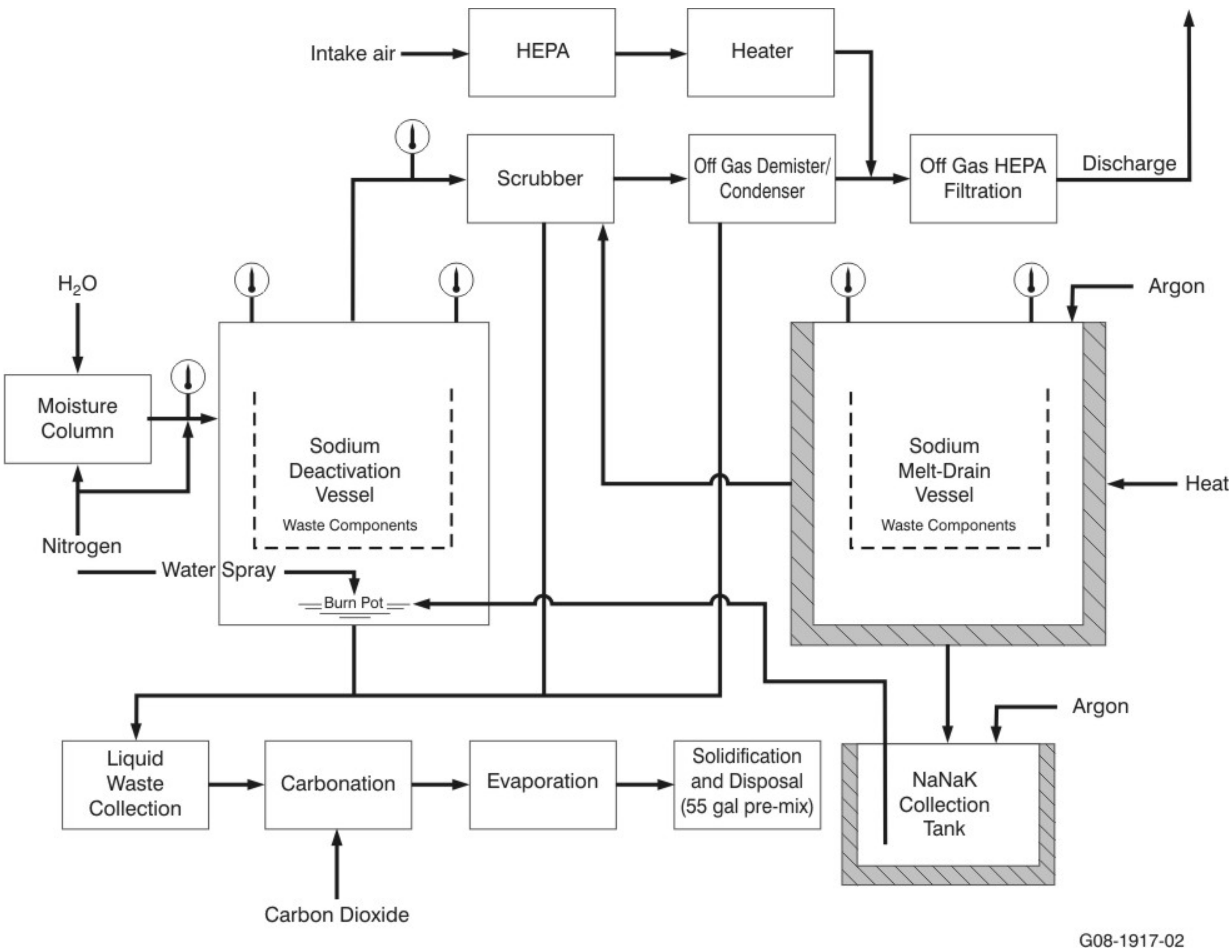

Figure 8. Simplified sodium process flow diagram.

3.2 Alternatives

The following sections describe the alternatives analyzed to complete the proposed action (Section 3.1). They are structured to include performing Phases I, II, and III in an existing modified INL hot cell. Phase IV would be completed in either a modified hot cell (New Waste Calcining Facility [NWCF] or Fluorinel Dissolution Process [FDP]) or a new hot cell (HFEF Annex or Mobile Hot Cell). To help understand this structure, a summary of the waste processing phases are as follows: Phases I, II, and III waste processing include opening the retrieved containers, removing the shield plugs, and removing the filler material to exposure the waste. RTR, waste sampling, sizing, and waste repackaging would also be performed. Waste segregation would be completed for Phase III waste. In addition to these waste processing activities, the sodium and NaK would be removed from the waste as would fuel pieces in Phase IV. Section 3.1.1 includes a detailed description of the phases.

3.2.1 Alternative 1 – INTEC Existing Facilities Alternative (Preferred Alternative)

Either the hot cells located in the NWCF (CPP-659) or the FDP Cell located in Fluorinel Dissolution Process and Fuel Storage (FAST) would be used to perform Phases I, II, III, and IV under Alternative 1, the Preferred Alternative. Modifications to the NWCF cells to support the waste processing actions would be completed as described in Section 3.5.1.2. Decontamination and modification would be performed as necessary for use of the FDP Cell as described in Section 3.5.1.3 to support processing the waste.

The two interim storage facilities available at INTEC (CPP-2707 and CPP-749) would be used for the Preferred Alternative.

3.2.2 Alternative 2 – MFC/INTEC Existing Facilities Alternative

The HFEF Decon Cell would be modified for Phases I, II, and III for Alternative 2. Modifications are described in Section 3.5.2.2. Interim storage needed for this part of Alternative 2 would be minimal since the containers would be delivered on a demand basis.

To complete Phase IV under Alternative 2, either the NWCF Cell or the FDP Cell would be used to perform waste processing actions. Modifications and decontamination would be performed as necessary to support the proposed action. The two interim storage facilities at INTEC (CPP-2707 and CPP-749) would be used for Phase IV under Alternative 2.

3.2.3 Alternative 3 – INTEC Existing Facility and New Construction at MFC

Alternative 3 includes the use of the hot cells located in the NWCF (CPP-659) to perform Phases I, II, and III. The two interim storage facilities available at INTEC (CPP-2707 and CPP-749) would be used for this part of Alternative 3.

Phase IV would be performed in facilities located at MFC for Alternative 3. Either the HFEF Annex or a Mobile Hot Cell would be used. The HFEF Annex would be constructed and operated as described in Section 3.5.2.3. The Mobile Hot Cell would be located near or within the RWSF and operated by a subcontractor. Performing Phase IV at these MFC facilities would require minimal interim storage.

3.2.4 Alternative 4 – MFC Existing Facilities and New Construction Alternative

The HFEF Decon cell would be modified for Phases I, II, and III. Phase IV would be performed in either the HFEF Annex or a Mobile Hot Cell at MFC.

Alternative 4 interim storage needs would be minimal. Containers would be delivered on a demand basis.

3.3 Alternatives Considered, but Eliminated from Detailed Analysis

3.3.1 Fuels Processing Facility

The Fuels Processing Facility, located at INTEC, is a specialized state-of-the-art facility designed in 1983, to recover highly enriched uranium from the dissolution of government-owned nuclear fuels. Construction of the Fuels Processing Facility was terminated in 1992, as part of the overall phase-out of uranium reprocessing at INTEC. The construction project was approximately 50% complete, with the basic structure completed as designed, but none of the process equipment or support systems were installed. The Fuels Processing Facility at INTEC fails to meet the following criterion:

- Complete processing of TRU/MTRU waste by a target date of December 31, 2015 and no later than December 31, 2018, based on the court-approved 1995 Settlement Agreement (Idaho 1995).

The facility does not include a cell that would provide the necessary containment. In addition, the facility was not designed to move large solid materials through a series of processing steps that would be needed for the RWDP process. A cell that includes all the necessary systems could not be constructed by the target dates.

3.3.2 Hanford T-Plant Complex

The Hanford Site T-Plant Complex is designed to handle RH LLW, RH MLLW, TRU waste, and MTRU waste. In accordance with their waste acceptance criteria, this facility will not accept uncharacterized or unsegregated (packaged by waste category) waste, which would require unpackaging, segregating, characterizing, and repackaging all the RSWF waste containers. The Hanford T-Plant Complex fails to meet the following criteria:

- Complete processing of TRU/MTRU waste by a target date of December 31, 2015, and no later than December 31, 2018, based on the court-approved 1995 Settlement Agreement (Idaho 1995)

- Minimize schedule impacts caused by transportation

- Not impact other DOE programmatic and operational activities.

3.4 No Action Alternative

The No Action Alternative would leave the RH waste in storage at MFC facilities. The long-term storage of containers could lead to regulatory noncompliance and possible environmental release problems because of deterioration of the liners and possible external release of pollutants to the surrounding soil. Surveillance and monitoring activities would continue according to the RSWF RCRA permit.

The RH waste at the INTEC Interim Storage Facility would remain in storage in the aboveground temporary storage containers. Current surveillance and maintenance activities of containers would continue.

The Hanford Site would continue to manage the traps based on their NEPA decisions and other requirements.

3.5 Potential Locations

Several existing hot cells would accommodate the proposed action with modifications and installation of new equipment. Two of the hot cells are located at INTEC and one cell is located at MFC. A new facility (HFEF Annex) could be constructed at MFC or a Mobile Hot Cell could be assembled and operated near the RWSF. The following sections provide a description of each of the hot cells and applicable modifications and interim storage facilities. The sections are divided by INTEC and MFC, respectively.

3.5.1 Idaho Nuclear Technology and Engineering Center

3.5.1.1 Description of Interim Storage. For operations at INTEC, an interim storage facility to temporarily store containers before or after processing would be needed to ensure operational continuity and process flow (supply chain management adequately meets feed stock requirements). It is anticipated that two existing INTEC facilities (see Figure 9) would be used for interim storage. The CPP-2707 Storage Pad is a concrete storage pad currently used to store casks that were used to transport spent nuclear fuel. The second facility, the Peach Bottom Fuel Storage Facility (CPP-749), would be viable for this purpose, with some expansion. Currently, several silos are empty within CPP-749 that would accommodate the containers. Additional silos could be added within CPP-749, if required.

Figure 9. Location of CPP-659, CPP-749, and CPP-2707 at the Idaho Nuclear Technology and Engineering Center.

3.5.1.2 Description of New Waste Calcining Facility Cell. The NWCF is divided into two major functional areas, the calciner area and the decontamination area. The decontamination area contains several hot cells. Cell 308 and Cell 306 are described below.

Cell 308, which would be used for waste processing, has approximately 380 ft^2 of floor space, with 3-ft-thick, high-density, concrete shielding walls up to 8 ft high and a 1-ft-thick concrete floor. Stainless steel lines the entire cell. Equipment provided for remote in-cell work includes an overhead bridge crane; three pairs of master-slave manipulators; an electromechanical manipulator; a turntable; and portable soak tanks and spray wands for decontamination solutions, steam, and water. The interior of Cell 308 is shown in Figure 10.

Cell 306 has approximately 300 ft^2 of concrete floor that is covered by stainless steel, with a 6-in. wainscot. The area walls are coated with epoxy-type paint. The RTR system is located in Cell 306.

Figure 10. New Waste Calcining Facility Cell 308 interior.

Modifications would be necessary to receive the HFEF-5 cans and the shipping containers. Fabrication of an HFEF-5 can receiving unit that receives the can vertically and reorients it to a horizontal position would be installed. The device would also hold and open the container, remove and size the waste materials, and load sized waste into shipping containers. In Cell 306, the RTR unit may require modifications, which could include installation of a turntable to receive and hold the HFEF-5 can and adjustments to and or replacement of the x-ray generator, image intensifier, dose-to-curie instrumentation stand, and potential modification to the dose-to-curie calculation.

3.5.1.3 Description of Fluorinel Dissolution Process Cell. The FDP cell is located within the FAST facility, which is divided into two operational areas: the FDP area and the fuel storage area. The nominal dimensions of the cell are 20 × 100 × 50 ft deep (Engineering Design File [EDF]-7389). The cell is constructed of reinforced concrete with 5-ft-thick walls and a 3-ft-thick floor. The floors and walls are lined with stainless steel up to the crane rails. There are four primary levels in the cell where operations can take place. The cell walls contain shielding windows equipped with master-slave manipulators. Figure 11 provides a current view of the FDP cell at the 0-ft level (looking south).

Figure 11. Current view of Fluorinel Dissolution Process cell at 0-ft level (looking south).

The FDP cell would be modified and upgraded to provide the necessary remote-handling equipment. The equipment would include a sodium treatment station to stabilize sodium extracted from the contaminated waste to a disposable form. Also, modifications would be made to provide necessary load-out capability from the cell.

To support off-loading the containers into the facility and transporting the containers into the FDP cell for processing, the hatch cover above the cell would be modified. Additionally, the entry door and adjacent structures allowing access to this area would be enlarged to accommodate the shielded cask and transport vehicle.

3.5.2 Materials and Fuels Complex

3.5.2.1 Description of Interim Storage. Utilization of the MFC hot cells would minimize the need for interim storage of a large number of containers out-of-cell. Some interim storage would be maintained at RSWF (e.g., new BB row), with containers being delivered on an on-demand basis rather than the larger batching campaigns required to ensure continuous supply to processing activities at INTEC.

3.5.2.2 Description of Hot Fuel Examination Facility Decontamination Cell. The HFEF (see Figure 12) contains two heavily shielded hot cells: an argon cell (Main Cell) and a decontamination cell (Decon Cell). The Decon Cell would be used for this proposed action.

The air-filled Decon Cell measures 20 ft long, 30 ft wide and 25 ft high. It is separated from the Main Cell by a 4-ft thick concrete wall. The Decon Cell has six workstations, each equipped with a shielding window and a pair of manipulators. The Decon Cell contains a spray chamber for decontaminated equipment and nonfissile materials. There are 10 material transfer penetrations and an air-bearing personnel access door. A roof hatch enables the transfer of materials and equipment or the cell can also be accessed through the two floor penetrations and the tunnel system.

Structural modifications include removing the current processing equipment, and subsequently installing new process equipment necessary for the proposed action. Examples of the equipment include a liner disassembly station, a sorting station, and a general-purpose table.

Figure 12. Hot Fuel Examination Facility location and the Proposed Hot Fuel Examination Facility Annex Location at Materials and Fuels Complex.

3.5.2.3 Description of Hot Fuel Examination Facility Annex Design. The HFEF Annex would be located directly west of the HFEF at MFC (see Figure 12). The HFEF Annex would include four separate floors (see Figure 13). The existing equipment in HFEF would be shared with the HFEF Annex and includes cranes, truck lock, cask cart, and cask tunnel. New equipment, such as an MEDE system, would be purchased and installed.

The waste processing cell would be 42 × 22 × 31 ft high and have an air atmosphere. The cell would have 14 windows with provisions for a set of sealed remote manipulators at each window, three floor penetrations, and a roof hatch. The walls, roof, and floor sections of the processing cell would be constructed of high-density concrete. The floor and lower-wall interior surfaces of the processing cell would be covered with an 11-gauge stainless-steel protective liner extending 8 ft up the walls.

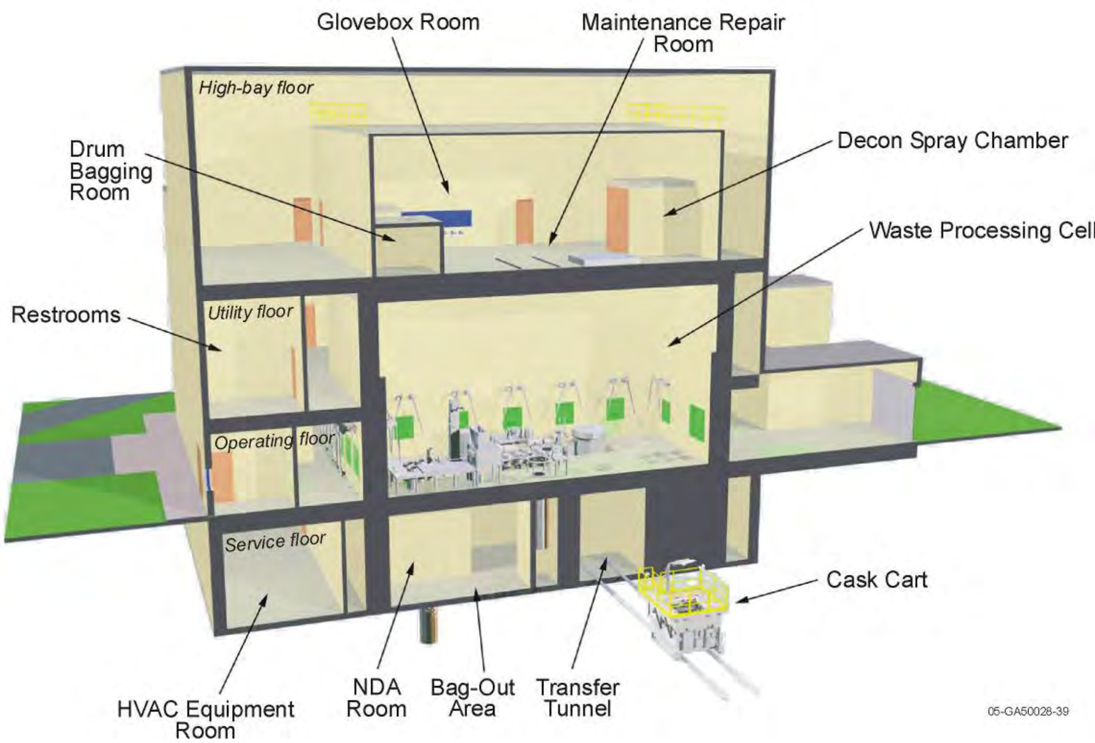

Figure 13. Crosscut 3-D rendering of the Hot Fuel Examination Facility Annex.

3.5.2.4 Description of the Mobile Hot Cell. A subcontractor would assemble, operate, and remove the mobile hot cell. The cell would be located within MFC, in or adjacent to the RSWF. This mobile cell is used for cutting, coring, and characterization of radioactive waste packages. To support the proposed action, satisfaction of the following design criteria would be required.

1. Technology must be based on existing design/equipment/facilities with proven full-scale (proof-of-process) demonstration of remote-handled waste retrieval and repackaging.

2. Treatment methods must be based on existing technology for remote treatment of sodium/NaK with proven, full-scale (proof-of-process) demonstration.

3. Technology must be capable of processing various waste container configurations.

4. Technology must be portable/modular and require minimal onsite fabrication/construction.

5. The safety design requirements of DOE Order 420.1B, Facility Safety, must be satisfied.

6. The technology must provide radiological shielding and must be designed and configured to maintain worker exposure as low as reasonably achievable.

7. The technology must be designed and constructed to the requirements of Nuclear Quality Assurance (NQA)-1.

4. AFFECTED ENVIRONMENT

The Idaho High-Level Waste & Facilities Disposition Final Environmental Impact Statement (DOE 2002) provides an extensive description of the INL Site's affected environment. This section provides a brief background description of only those environmental aspects affected by the proposed action.

The INL Site is an 890-square-mile DOE facility located on the Eastern Snake River Plain. It is primarily located within Butte County, but portions of the INL Site are also in Bingham, Jefferson, Bonneville, and Clark Counties. All land within the INL Site is controlled by DOE, and public assess is restricted to highways, DOE-sponsored tours, special-use permits, and the Experimental Breeder Reactor-I National Historic Landmark.

Public highways U.S. 20 and 26 and Idaho 22, 28, and 33 pass through the INL Site, but off-highway travel within the INL Site and access to INL Site facilities are controlled. Currently, 6,800 people work at the INL Site; including 806 people at MFC, and 1,121 people at INTEC. No permanent residents reside on the INL Site. Population centers in the region include large cities (more than 10,000 residents), such as Idaho Falls, Pocatello, and Blackfoot, located to the east and south, and several smaller cities (less than 10,000), such as Arco, Fort Hall, Howe, and Atomic City, located around the INL Site.

Vegetation is dominated by low shrubs, such as sagebrush and rabbitbrush, a wide variety of grasses, and some juniper trees. The area is populated with animals that inhabit sagebrush grasslands. Animals include pronghorn, deer, elk, coyotes, badgers, rabbits and many birds including raptors, game birds, and waterfowl, a variety of small rodents, and several small reptiles. Many of the plants and animals that live within the boundaries of INL are culturally significant to the Shoshone-Bannock Tribes.

Cultural resources are numerous on the INL Site (DOE-ID 2007). Resources that have been identified include:

- Prehistoric archaeological sites representing aboriginal hunter-gatherer use over a span of approximately 12,000 years

- Historic archaeological sites representing settlement and agricultural development during the period from 1805 and the late 1920s

- Historic architectural properties associated with World War II and with the development of nuclear science and technology

- Areas of cultural importance to the Shoshone-Bannock Tribes.

Many of these resources are eligible for nomination to the National Register of Historic Places. Archaeological sites and Native American resources are generally located in undeveloped areas, while historic architectural properties are found within facility perimeters at the INL Site. A tailored approach to management of these resources and compliance with relevant federal and state law is included in DOE-ID's INL Cultural Resource Management Plan (DOE-ID 2007), which is based on a Programmatic Agreement between DOE-ID, the Idaho State Historic Preservation Office and the Advisory Council on Historic Preservation as well as an Agreement in Principle between DOE-ID and the Shoshone-Bannock Tribes.

The area surrounding the INL Site is classified as a Prevention of Significant Deterioration Class II area, designated under the Clean Air Act (42 USC § 7401) as an area with reasonable or moderately good air quality while still allowing moderate industrial growth. Craters of the Moon Wilderness Area, which is approximately 6.4 miles southeast from the INL Site boundary, is classified as a Prevention of Significant Deterioration Class I area, and is the nearest area to the INL Site where additional degradation of local air quality is severely restricted. The INL routinely monitors air quality using a network of air monitors. The monitors collect samples to measure particulate matter, radioactivity, and other air pollutants.

Releases of radionuclides to the environment from current INL operations can expose individuals near the INL Site to radiation. Types and quantities of radionuclides released from INL operations are listed in the National Emission Standards for Hazardous Air Pollutants annual reports (DOE-ID 2006), along with estimated doses caused by these releases. Historically, the dose to the maximally exposed individual (MEI) has been in the range of hundredths of an mrem/yr, and therefore less than 1% of the 10-mrem/yr federal standard.

INL Site workers receive the same dose as the general public from background radiation, but they also receive an additional dose from working in facilities with nuclear materials. The average dose to the individual worker (involved worker) and the cumulative dose to all INL Site workers (total workers) fall within the radiological regulatory limits of 10 CFR 835. According to the accepted risk estimator of 6.0×10^{-4} latent cancer fatality per person-rem among workers, 0.066 latent cancer fatality is projected for INL Site workers from normal operations in 2004 (DOE 2003).

5. ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

Several of the environmental consequences for the alternatives are the same or very similar. These consequences include air quality (nonradiological and radiological), public and occupational health, the T-25 Powerline Road upgrade (cultural and biological resources), and accidents. Because there are no substantial differences, the environmental consequences have been combined for the four alternatives and are discussed in Section 5.1. The environmental consequences that have substantial differences for each alternative include transportation, historic cultural resources, and waste management. They are presented by alternative in Section 5.2.

5.1 Environmental Consequences Common to all Alternatives

5.1.1 Air Quality

5.1.1.1 Nonradiological Emissions. Nonradiological emissions would be minimal during both building modification and operational stages. Particulate matter (PM), both PM-2.5 and PM-10, would be expected in both stages. During the building modification or construction stage, fugitive dust, in the form of PM, would be controlled using industry standards. Based on the minimal proposed modification or construction, no ambient air quality standard would be expected to be exceeded (Idaho Administrative Procedures Act [IDAPA] 58.01.01.577). During the operational stage, emissions of toxic metals and particulate matter are projected.

All emissions from operations in the existing hot cells or the new cells (HFEF Annex or Mobile Hot Cell) would be abated using two high-efficiency particulate air (HEPA) filters. Any particulate material released from this waste matrix during examination, processing, sizing, and repackaging would be captured in the HEPA filters before release to ambient air. Little or no release of volatile compounds is anticipated based on historical knowledge and the waste matrix.

5.1.1.2 Radiological Emissions. Radiological emissions are not anticipated during the modification or construction stage of any of the alternatives. Based on the proposed waste processing operations, the potential for release of particulate contamination is greatest when the waste is exposed and handled. Potential for release of gaseous/vapor-phase radionuclides is greatest during treatment of sodium and NaK-contaminated waste. During waste processing operations, the amount of radioactive material suspended during sorting/segregation operations would be the same for each alternative. Sorting/segregation operations planned for all of the alternatives would have heating, ventilating, and air conditioning systems with equivalent cleanup efficiencies, i.e., two stages of HEPA filtration each with 99.97% removal of airborne particulate material.

A fraction of the total waste inventory would pass through the sodium removal process. Based on current design information for all the potential sodium treatment technologies proposed for this action, the sodium removal process equipment would incorporate a scrubber and HEPA filter, and would be located in a hot cell. The scrubbed and filtered off-gas from the sodium removal process would be exhausted to the hot cell containing the process. The hot cell would be exhausted through two stages of HEPA filters. The sodium removal process has additional abatement and a relatively small fraction of the total inventory of particulate-forming radionuclides would pass through the sodium removal process. Consequently, particulate radionuclide emissions from the sodium removal process would cause less than 1% of the dose caused by particulate material emissions from the sorting process. However, the sodium removal process would free the entire 1,208-Ci inventory[c] of tritium present in the sodium metal. This tritium would be released, unabated, to the atmosphere as a gas. Overall, radiological impacts from the proposed project are predominantly from tritium emissions during Phase IV.

The composition of the inventory of particulate radionuclides affected by waste sorting was estimated using an inventory developed for dose consequence analysis of the HFEF Annex design basis accidents (EDF-6812). The original inventory was based on analysis of Argonne National Laboratory fuel examination wastes, and included a large number of radionuclides. This inventory was screened using National Council on Radiation Protection ([NCRP] 123, 1996) screening factors to identify the radionuclides causing 99.95% of the dose for the entire inventory. Doses were estimated using the screened list of radionuclides. The estimated emissions caused by waste sorting are based on the assumption that waste containing a total of 12.6 MCi of radioactivity would be sorted over the operating lifetime of the project (assumed to be 10 years). It is also assumed that the entire radioactive inventory is associated with material that could become suspended in air (e.g., fines, surface contamination). This is a conservative assumption – a large fraction of the inventory is expected to be associated with nonsuspendable material such as fuel fragments. Suspension of radioactive material was calculated (DOE 2000) for the removal of waste from liners and placement on the sorting table, and for entrainment in the airflow through the sorting area. The suspended material was assumed to pass through two stages of HEPA filters, with an efficiency of 99.97% efficiency per stage. Table 5 presents the inventory and emissions estimates for waste-sorting operations.

Table 5. Screened inventory of radionuclides in solid/particulate form and emissions for normal waste-sorting operations.

Nuclide	Fractional Abundance in Inventory Relative to Cs-137	Total Project Emissions During Normal Operations (Ci)
Am-241	4.22E-03	2E-06
Co-60	1.25E-03	5E-07
Cs-134	1.15E-03	4E-07
Cs-137	1.00E+00	4E-04
Eu-154	3.10E-03	1E-06
Eu-155	1.60E-02	6E-06
Sb-125	4.20E-03	2E-06
Sr-90	6.76E-01	3E-04
Pu-238	7.01E-04	3E-07
Pu-239	4.74E-03	2E-06
Pu-240	4.86E-03	2E-06
Pu-241	1.71E-01	7E-05
Pu-242	4.22E-03	2E-06
U-234	6.85E-04	3E-07

c. Personal communication from Roy Grant, email to Paul Ritter, February 2, 2009, subject: RWDP EA Comments 1-29-09, attachment titled Update of Sodium Source Information and Re-evaluation of Tritium Content, and personal communication with David Polzin (Hanford), documented in email from Paul Ritter to Wendy Savkranz, September 30, 2008, , Subject: Telecon with Dave Polzin Re: FFTF Large Component Inventories for the RWDP EA.

5.1.2 Public and Occupational Health

5.1.2.1 Public Health. Doses and risks were calculated for releases during waste sorting and sodium removal operations using the CAP88-PC, Version 3.0 (EPA 2007) code. The CAP88-PC code is required by EPA to show compliance with the limit on dose to members of the public caused by radionuclide emissions to air from DOE facilities (40 CFR 61, National Emission Standard for Hazardous Air Pollutants, Subpart H). The CAP88-PC code calculates environmental concentrations of radionuclides caused by emissions, and calculates dose and risk based on Federal Guidance Report 13 (EPA 1999) methods. Emissions from the FDP cell pass through the FAST stack, which satisfies the "good engineering practice" criterion for stack height relative to the height of nearby structures (40 CFR 51.100). Emissions from the FAST stack are modeled as elevated releases using appropriate meteorological data and stack parameters. The potential emissions from other alternative facilities are modeled as ground-level releases. The MEI and population doses were calculated for each facility-specific MEI location and population distribution. Population dose was calculated using the 2000 census data. The hypothetical MEI was assumed to live at the off-Site location having the highest time-integrated exposure to emissions resulting from each processing phase and alternative location.

Doses caused by the total emissions during sorting (all phases) and emissions during sodium removal processing were calculated and compared to determine the relative importance of releases caused by these two processes. Population dose was calculated for emissions from INTEC and MFC using the 2000 census data. The hypothetical MEI was assumed to live at the off-Site location having the highest time-integrated exposure to emissions resulting from that processing phase. Based on these dose calculations, the MEI and collective doses and risks potentially caused by the RWDP are determined by tritium emissions during sodium removal processing, and the results for each alternative are determined by the location of sodium removal processing for each. The dose to the MEI is several orders of magnitude less than the dose received from natural background radiation, and well below the applicable standard (40 CFR 61, Subpart H), which limits doses caused by atmospheric releases of radioactivity from a DOE facility to 10 mrem/y. Table 6 summarizes the results (EDF-8913) of the MEI and population dose calculations and latent cancer fatality estimates. There are no regulatory standards limiting population dose; however, the population dose resulting from the proposed operation is also several orders of magnitude less than the population dose received because of natural background.

Table 6. Population and maximally exposed individual dose for releases during normal operations.

Receptor Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Population within 50 miles				
Dose (person rem)	7.5×10^{-1}	7.5×10^{-1}	$1.2 \times 10^{+0}$	$1.2 \times 10^{+0}$
Cancer Fatality Risk (per year)	6.1×10^{-6}	6.1×10^{-6}	9.9×10^{-6}	9.9×10^{-6}
Maximally Exposed Individual				
Dose (mrem)	3.1×10^{-2}	3.1×10^{-2}	4.1×10^{-2}	4.1×10^{-2}
Latent Cancer Fatality Risk	1.9×10^{-8}	1.9×10^{-8}	2.6×10^{-8}	2.6×10^{-8}

5.1.2.2 Worker Health. The dose received by workers would be monitored and limited similarly for operations at any of the proposed facilities. Although the actual dose allowed for workers would be determined when more definite operational conditions have been defined, it is assumed that the same allowable dose would be applied regardless of the facility used for the waste processing operations.

5.1.3 T-25 Powerline Road Upgrade

Impacts to cultural and biological resources would occur only if the T-25 Powerline Road route is selected for waste shipments rather than U.S. Highway 20. This route (Section 3.1.2.2.2) could be used for all the alternatives and so the cultural and biological impacts do not differ among the alternatives.

5.1.3.1 Archaeological Cultural Resources. Archaeological investigations of the T-25 Powerline Road (Pace 2008) have shown that eleven prehistoric archaeological sites with potential for nomination to the National Register of Historic places are located within a 120 ft-wide area of potential effect associated with the T-25 Powerline Road upgrade. These sites are important because they may contain subsurface cultural deposits with information that can be used to understand local and regional prehistory. Native American cultural resources and values may also be identified along the T-25 Powerline Road through continued communication with the Shoshone-Bannock Tribes.

Should this route be selected for use, final design plans addressing the road modifications would be completed. At that time, actions would be taken to complete identification of any Native American resources in the project area and develop strategies to protect these resources and the identified archaeological resources during road upgrade activities. The measures could include:

- Development of a Cultural Resource Protection Plan in coordination with the Shoshone-Bannock Tribes and Idaho State Historic Preservation Office

- Archaeological investigations, including test excavation, in advance of ground disturbance to catalog and preserve the important information present at each locality

- Modification of project plans to avoid damage to identified resources

- Cultural resource monitoring of ground disturbance with authority to temporarily halt work to salvage any sensitive materials uncovered

- Cultural resource sensitivity training for project personnel to prevent unauthorized artifact collection, off-road vehicle use, and other activities that may impact cultural resources.

An additional cultural resources-specific evaluation would be completed prior to any of the road upgrade activities, which may identify additional measures, particularly in regard to natural resource concerns that could be raised by the Shoshone-Bannock Tribes.

5.1.3.2 Biological Resources. Eight distinct plant community types are found along the T-25 Powerline Road between MFC and the Auxiliary Reactor Area-IV facility (DOE 2005a). About one-third of the length of the road is in the Sagebrush Steppe community type. The understory is primarily native perennial grasses, other shrubs, including green rabbitbrush, and native perennial forbs.

Six sensitive plant species have the potential to occur in the area to be affected by the upgrade of T-25 Powerline Road based on the habitat requirements of those species. Those species include: *Atragalus aquilonius* (Lemhi milkvetch), *Astragalus diversifolius* (meadow milkvetch), *Camissonia pterosperma* (wing-seeded evening-primrose), *Catapyrenium congestum* (earth lichen), *Eriogonum capistratum* Rev. var. *welshii* Rev. (Welsh’s buckwheat), and *Ipomopsis polycladon* (spreading gilia). Surveys for these species have not been conducted and no information is available regarding the potential for the proposed action to impact them (DOE 2005a and Hafla et al. 2008).

A number of small mammals and reptiles permanently reside in the area around the T-25 Powerline Road, while other bird species and large mammals use this habitat in a seasonally transitory manner. Wildlife species of concern include all migratory birds (including greater sage-grouse and raptors), pygmy rabbits, and Great Basin rattlesnakes, and all large mammal species (Hafla et. al. 2008). The INL is included in a geographical area where the gray wolf is listed by US Fish and Wildlife Service as an experimental, nonessential population. Although it has been reported, its presence has not been confirmed. No critical habitat for threatened or endangered species, as defined in the Endangered Species Act, exists on the INL site. However, if a species such as the greater sage grouse or pygmy rabbit are listed before or during upgrade of the T-25 Powerline Road, DOE would initiate formal consultation with the US Fish and Wildlife Service.

Breeding, brood-rearing, and overwintering habitats for sage-grouse occur within the proposed road upgrade area. Although all habitat components are important to the survival of sage-grouse, lek locations (breeding grounds) are commonly considered a focal point for managing this species (Braun et al. 1977). Protecting habitat for non-migratory populations when sagebrush is distributed uniformly includes minimizing disturbance to sagebrush and herbaceous understory within 2 miles of active lek locations, and 3 miles when sagebrush is not distributed uniformly (Connelly et al. 2000). Sage-grouse populations on the INL exhibit numerous seasonal movements and can be considered migratory populations because they make long-distance movements (>6 miles one way) between or among these habitats (Connelly et al. 1988 and Connelly et al. 2000). Migratory populations require the consideration of protecting areas within 11 miles from leks to include important nesting habitat (Connelly et al. 2000). Research has shown that protecting habitat immediately around leks may not provide protection of important nesting areas (Wakkinen et al. 1992).

There is a sage-grouse radio telemetry study currently being conducted by the Environmental Surveillance, Education and Research (ESER) program the INL site. The results of this research will be incorporated into the INL Conservation Management Plan and a Candidate Conservation Agreement with the U.S. Fish and Wildlife Service. Sage-grouse were captured and collared at numerous leks throughout the INL in 2008 including a lek located between the T-25 Powerline Road and T-24 southwest of MFC (Figure 14). This lek is located less than 2 miles from the T-25 Powerline Road. Twelve birds were collared from this lek in 2008 and telemetry surveys show that seven birds remained in the area between T-24 and T-25 Powerline Road through spring and into early summer (Figure 14). In 2008, there were three sage-grouse nests located within about 2 miles of the T-25 Powerline Road (Figure 14).

There is 3.3 miles of the T-25 Powerline Road within the 2 mile non-migratory population buffer, and about 7.8 miles of the road lies within the 3 mile buffer. This total distance would increase if the leks with unknown activity status were considered (Figure 14). The entire road is within the migratory population buffer distance of 11 miles.

Pygmy rabbits are a sagebrush steppe obligate species and are currently being considered for protection under the Endangered Species Act. Pygmy rabbits depend on sagebrush for cover and forage, and once sagebrush is removed from an area pygmy rabbits disappear (Green and Flinders 1980 and Katzner et al 1997).

Field surveys in the area around the T-25 Powerline Road were conducted in 2005 (DOE 2005a), and pygmy rabbit occurrence was assessed based on the presence of pygmy rabbit sign (i.e., sightings of rabbits, burrows, and or scat) and the presence of suitable sagebrush habitats. Suitable sagebrush habitats were identified by the presence or absence of sagebrush. Pygmy rabbit sign was identified in two locations along the T-25 Powerline Road (Figure 14). One location was within contiguous sagebrush habitat and the other was isolated in the middle of a large burn. Fifty-six percent of vegetation plots along the T-25 Powerline Road were potentially suitable (i.e., had sagebrush cover) for pygmy rabbits.

There have been additional pygmy rabbit surveys conducted by the ESER across the majority of the INL site and across the Sagebrush Steppe Ecosystem Reserve. Active burrow systems are widespread across the INL where sagebrush is present and local populations appear stable. These surveys are ongoing and preliminary sampling on selected plots 0.25 miles by 0.25 miles shows that there are 31 burrow systems within 1 mile of the T-25 Powerline Road and more burrows in adjacent areas (Figure 14).

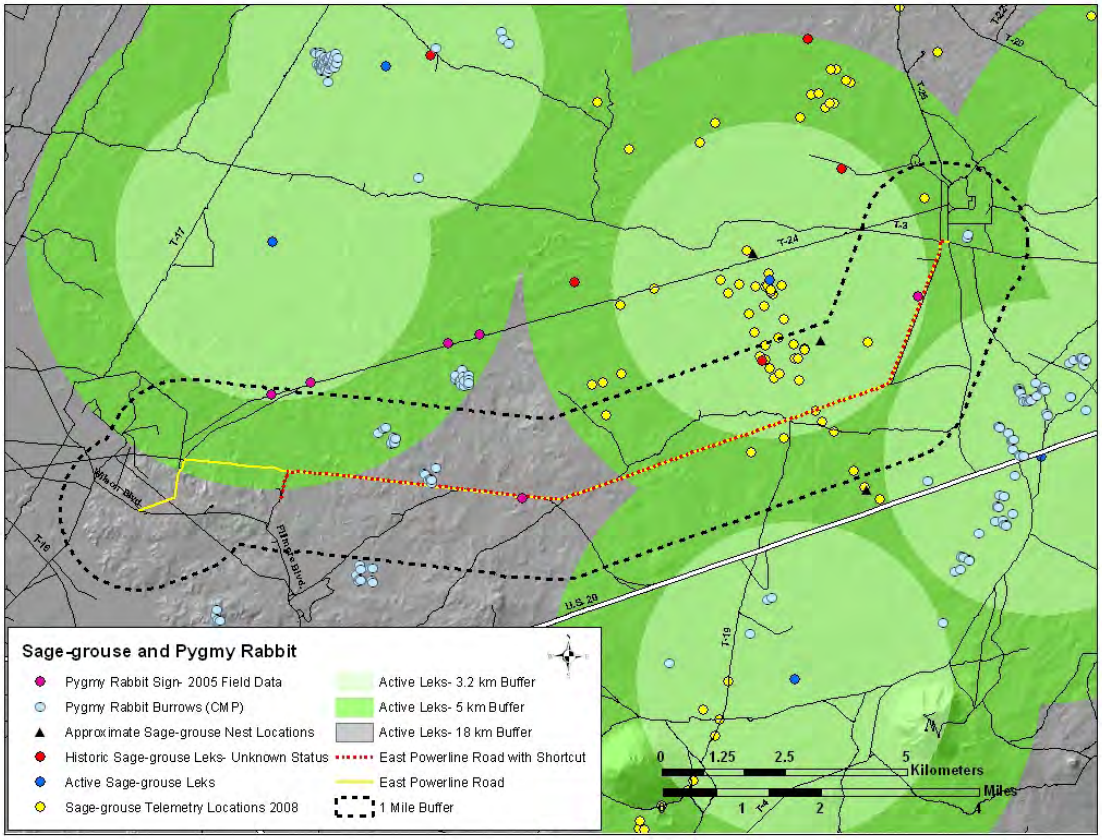

Figure 14. Presence of sagebrush obligate species (i.e. sage-grouse and pygmy rabbits) based on 2005 field surveys and ongoing Wildlife Conservation Society surveys from 2006 to November 2008.

Ferruginous hawk (*Buteo regalis*), Swainson's hawk (*Buteo swainsoni*) and long-eared owl (*Asio otus*) have historically nested in the project area (Hansen 1994). Recent inventories in the project area have confirmed the presence and nesting of ferruginous hawk and Swainson's hawk but not the long-eared owl (ESER, unpublished data). Both the ferruginous and Swainson's hawk have been documented to nest on the power line along T-25 Powerline Road as well as the Utah juniper (*Juniperus utahensis*) trees scattered along this road (ESER, unpublished data). The increased noise, activity and dust from additional traffic along T-25 Powerline Road could adversely impact both of these species by causing displacement from current hunting and nesting areas or nest abandonment. Collisions with vehicles are also possible.

The sage sparrow (*Amphispiza belli*) has been documented to breed and forage in the sagebrush habitat along T-25 Powerline Road (ESER, unpublished data). It is a sagebrush obligate and has been one of the most common species observed during the past 20 years of breeding bird surveys on the INL (Shive 2008).

The effects of upgrading the road on this same route in terms of the ability to meet Natural Resource Management Objectives was analyzed (DOE 2005a). The results of the analysis determined that this route would not fully meet any of the stated natural resource objectives. However, if appropriate controls were incorporated it may be possible to meet resource objectives associated with sensitive species (including sage grouse and pygmy rabbits) and their habitat. The controls would include preventing animal and vehicle collisions, and minimizing weed invasion (DOE 2005a). The analysis concluded the impacts regarding the resource management objectives would be minimal given appropriate controls. Objectives related to reducing the need for revegetation, habitat fragmentation, maintenance of a large undeveloped sagebrush steppe ecosystem and protection of biodiversity may be met, but may also result in other impacts to ecological resources regardless of control attempts. However, for the natural resource objectives, a note of caution that control attempts may not provide adequate protection against habitat fragmentation, loss of the large parcel of undeveloped sagebrush steppe necessary as habitat for many sagebrush-obligate species, or loss of biodiversity (DOE 2005a).

Potential impacts to vegetation communities along the road would be controlled by minimizing the footprint of the soil disturbance, revegetating the areas that have been disturbed, and weed control. DOE would implement weed control actions and re-vegetate as appropriate. If the powerline road was upgraded, DOE would make every effort to reduce soil disturbance to the minimum possible. Revegetating with a diverse mix of native species similar in composition to the existing plant community may help maintain the diversity of those communities. The revegetation effort would need to consider the sagebrush steppe and the sandy soils near the T-25 Powerline Road. Sagebrush steppe is generally successful in only one of three years. The sandy soils are not suitable for replanting and are susceptible to wind erosion. Although it would not ensure successful revegetation, the DOE would use all practicable means to re-establish native vegetation on bare soils if DOE chose to upgrade the road.

The T-25 Powerline Road upgrade would have unavoidable impacts common to all road development such as: (1) loss of ground-dwelling wildlife species and associated habitat, (2) displacement of certain wildlife species due to increased habitat fragmentation, and (3) an increase in the potential for collisions between wildlife and motor vehicles. The following control measures would be implemented to lessen the impact on wildlife: seasonal timing of activities, lower speed limits to 15 mph, and awareness programs.

Table 7. Lengths of roads by classification within 6 miles of T-25 Powerline Road.

Road	Length (mi)
Paved or Light-Duty Roads	40.94
Unclassified Roads	13.66
Perimeter Roads	0.13
Priority 1- Emergency Evacuation and Security Roads (Graded)	8.69
Priority 2- Service Access Roads (Spot Graded)	5.07
Priority 3- Wildland Fire Access Roads (Passable)	77.62
Priority 4- Not Maintained Roads	207.48
U.S. Highways	26.29
	379.87

Within six miles of T-25 Powerline Road there are approximately 380 miles of existing roads. This covers an area of approximately 232 square miles. Table 7 shows the length of roads by road type and maintenance priority. Figure 15 shows the six-mile area around T-25 powerline road and the locations of roads within that area. Powelines within this same area are also noted on Figure 15.

There is extensive literature discussing the potential short-term and long-term impacts of road building. Even though we cannot quantify the potential impacts to ecological resources, it is possible to do a qualitative assessment of what those impacts might be. This upgraded road will re-set the southern boundary for what remains of the large, undisturbed central core area of the INL. That boundary is now, arguably, set by Highway 20, with some interruption by the east powerline. The boundary on the west is generally marked by Lincoln Boulevard, INTEC, Central Facilities Area and Power Burst Facility. Recent activities associated with the development of the Critical Infrastructure Test Range Complex have strengthened the effectiveness of the boundary in that area. The National Security Test Range to the north has caused a significant reduction in the size of that undisturbed core area.

An additional biological resources specific evaluation would be completed prior to any of the road upgrade activities which identify additional measures to aid in lessening the impacts to the biological resources.

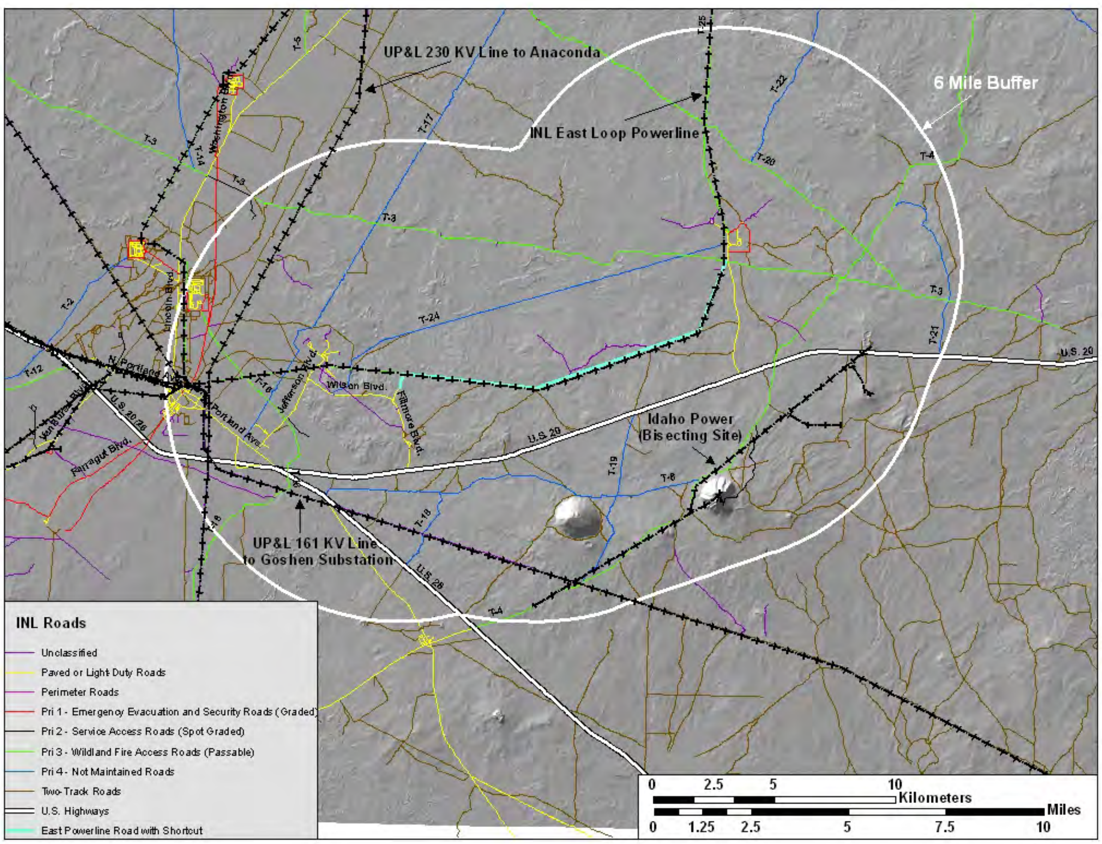

Figure 15. Locations and classifications of roads and powerlines within 6 miles of T-25 Powerline Road.

5.1.4 Accidents

Safety analyses would be performed to address hazard and accident analyses for processing RH waste and scrap materials at FAST and NWCF. In addition, HWMA/RCRA permits covering RH waste management activities at FAST, NWCF, and CPP-2707/749 interim storage areas would include written contingency plans and prevention and preparedness plans. Those plans, as well as the INTEC emergency plans, would describe the response measures used to deal with potential emergencies involving hazardous materials, RH waste, and mixed waste.

Nuclear materials, reactive metals, and other hazardous materials at the HFEF Annex or the Mobile Hot Cell would be handled similarly to previous routine and ongoing activities at other MFC hot cells, i.e., HFEF hot cells. The hazard and accident analyses for processing RH waste and scrap materials at MFC would be documented in a Safety Analysis Report. In addition, HWMA/RCRA permits covering MFC RH waste management activities would include written contingency plans and prevention and preparedness plans. Those plans and the MFC emergency plans would describe the response measures used to deal with emergencies involving hazardous materials, RH waste, and mixed waste.

The principal material hazard is the large inventory of RH waste streams currently stored in INL Site facilities. The most likely accident scenarios are listed in order of probability in the following subsections. The following subsections present potential impacts and controls that are currently in place. All of these accidents produce similar results—primarily, radiation exposure to workers. The amount of dose received would depend on the severity of the accident. A full breach of the shipping cask (or other loss of shielding) that exposed a shipping container could result in accessibility to radiation fields as high as 15,000 rem/hr at the surface of the container; however, most of the waste would produce exposures in the range of 1,000 rem/hr at direct contact.

5.1.4.1 Container Penetration by Backhoe. If a container is penetrated by a backhoe, radioactive contamination could be released to the soil and air. Additionally, highly radioactive components or spent nuclear fuel could be released from the container. Impacts would be additional waste generation and could result in additional worker dose. This accident would result in immediate work shutdown and evacuation of the immediate area. Emergency recovery procedures would be implemented and remain in effect until full recovery.

The controls currently in place include excavation procedures that require direct visual observation of excavation activities. As necessary, this would be accomplished directly by an observer or by video cameras and monitors. All workers would be fully trained and qualified for their roles and responsibilities and would be trained on all aspects of liner excavation. Workers would attend pre-job briefings on the sensitive nature of the excavation, the associated hazards, and the critical importance of the equipment not contacting the liner. Additionally, a radiological control technician would be present to monitor radiological conditions as the container is exposed, and a supervisor would be present to observe all activities. Personnel could immediately implement emergency action plans.

5.1.4.2 Abnormal Transportation Operations. A variety of transportation accidents are conceivable and could include:

- Dropping the shipping container
- Improper loading of the shipping container
- Single vehicle crash during transport
- Multiple vehicle crash during transport.

Dropping an unlicensed shipping container could result in a cracked or failed shipping container. This could pose contamination and penetrating radiation hazards. However, dropping an unlicensed container is not likely to produce any adverse effects to workers or the public because the containers will be engineered to protect against those risks, and or procedures would be put in place to mitigate the consequences of an accident before the shipments are made.

Vehicle crashes involving just the transport vehicle or other cars could happen from MFC to INTEC. A safety analysis of similar material analyzed a truck accident with ensuing diesel fuel fire as a credible event (PLN-1851). For an unlicensed but shielded shipping cask, that analysis resulted in a public exclusion distance of 650 meters. In addition, as stated in PLN-1851, the transport vehicle driver would be trained as appropriate to meet all appropriate DOT driver qualifications.

As previously discussed, out-of-commerce shipments likely would be used for transporting this waste. For U.S. Highway 20, road closures and security escorts are required controls that would be implemented. For use of the T-25 Powerline Road, security escorts or road barricades would be used to ensure no other vehicles entered the road during the shipment.

For the waste shipments from Hanford to the INL, a licensed Type B shipping cask would mitigate radiological exposures during transport because of the cask's massive shielding. Such casks are specifically designed to withstand severe transportation incidents.

5.1.4.3 Facility Operations. A feasible accident during cell operations includes mishandling of sodium or NaK, resulting in a fire. Ignition could occur if sufficient amounts of fine particulate sodium or NaK material are created and exposed to air, an uncontrolled reaction with water is initiated, or an ignition source is applied. A sodium or NaK fire would generate large quantities of radioactively contaminated sodium oxide fumes and particulate material (e.g., sodium hydroxide and sodium carbonate) within the cell. This accident would result in immediate work shutdown and activation of the emergency response systems. Emergency recovery procedures would be implemented and would remain in effect until full recovery. The consequence of a sodium fire is estimated to be low for the workers, the off-Site public, and the environment (EDF-9070).

For worker protection, several controls are in place as required by 29 CFR 1910 (2007) and 40 CFR and implemented by procedures and manuals. Additional controls to manage a fire would be defined in the Fire Hazard Assessment and implemented by a combination of engineered design features (e.g., metal fire extinguishers), procedures, training, and staffing. All workers would be fully trained and qualified for their roles and responsibilities. Workers would attend pre-job briefings on cell operations, the associated hazards, and the critical importance of proper handling of hazardous materials.

5.1.5 Intentional Destructive Acts

The plausible impacts from intentional destructive acts are bounded by potential accident scenarios identified in Section 5.1.4. The potential for intentional destructive acts is reduced by the routine screening processes and access controls currently in place at the INL. Additional screening of the transport drivers for behavioral issues, having several personnel involved in all aspects of the operations, and strictly limiting public access to the waste during retrieval, transport, and processing operations would enhance existing controls.

5.2 Environmental Consequences That Differ Among Alternatives

5.2.1 Transportation

Due to the characteristics or properties of the material being transported, radiation exposure to humans poses the most prevalent potential adverse consequence. Radiation exposure during transportation operations is most likely to occur during material handling operations, when the waste is being loaded into or out of the shipping container. Consistent with DOE's as-low-as-reasonably-achievable policy (DOE 1999, pg vii), the dose rate for material handling workers will be controlled to ensure no worker exceeds the administrative control limit, which is always set considerably less than the 5-rem/yr dose allowed by regulation (10 CFR 835). This will be achieved using engineering controls to ensure that shielding and distance are maintained when the material is transferred from one container to another. Engineering and administrative controls also will be used to ensure that material handling operations do not place the material in an unrecoverable position.

For transporting the waste from MFC to INTEC, radiation exposure is expected to be low during actual movement of the material. The DOE's policy is to strive to maintain shipment dose rates at or below the DOT limits. During transit, the driver would be the person most likely to receive the highest dose, which would be less than 6.7 mrem per shipment.

The shipping cask shielding and, for out-of-commerce shipments, the distance provided by the public access restrictions, would ensure radiation dose to the public from transportation would be virtually immeasurable.

5.2.1.1 INTEC Existing Facilities Alternative (Alternative 1 [Preferred Alternative]). Under the Preferred Alternative, all the waste would be processed at INTEC. Therefore, all but 30 canisters would be transported from MFC. This alternative would require 949 road closures traveling a total of 24,674 road miles. This alternative would have the highest potential adverse transportation consequence. The driver would be the person most likely to receive the highest dose, which would be less than 6.7 mrem per shipment. Approximately 949 shipments would be completed under this alternative not including the 30 facility waste transfers to address the waste stored at INTEC.

5.2.1.2 MFC/INTEC Existing Facilities Alternative (Alternative 2). Under this Alternative, Phases I, II, and III waste would be processed at the HFEF Decon Cell. Phase IV would be processed at either the NWCF or FDP Cell at INTEC. Phase I waste would be transported to MFC from INTEC and Phase IV waste would be transported from MFC to INTEC. Phases II and III waste would be transported to the HFEF Decon Cell using established waste transport processes. Alternative 2 would result in environmental impacts similar to Alternative 1. The 910 shipments would travel 23,660 public road miles and 910 road closures would be required to support moving the waste.

5.2.1.3 INTEC Existing Facility and New Construction at MFC (Alternative 3). Under this Alternative, Phases I, II, and III waste would be shipped to INTEC for processing and Phase IV waste would be processed at MFC. The Phase IV waste would be transported to either the new HFEF Annex or the Mobile Hot Cell using established waste transport processes. The transportation impacts for Alternative 3 would be minimal (62 shipments, 62 road closures, and 1,612 public road miles).

5.2.1.4 MFC Existing Facility and New Construction (Alternative 4). All the waste would be treated at MFC. Phase I waste would require transportation to MFC. Therefore, Alternative 4 would result in a limited number of public road miles traveled similar to Alternative 3. Thirty shipments, 30 road closures, and 780 total road miles traveled.

5.2.2 Historic Cultural Resources

The Preferred Alternative would have no impact to historic cultural resources because the facilities to be modified at INTEC are not eligible for the National Register. However, the HFEF building, integral to Alternatives 2 and 4, is eligible for nomination to the National Register of Historic Places. Under DOE-ID's "INL Cultural Resource Management Plan" (DOE-ID 2007), standardized methods for documenting the important elements of historic properties like HFEF have been developed in consultation with the Idaho State Historic Preservation Office. These strategies are employed for historic buildings at all INL facilities.

5.2.2.1 INTEC Existing Facilities Alternative (Alternative 1 [Preferred Alternative]). The INTEC facilities proposed for Alternative 1 are not eligible for the National Register. There would be no historic cultural resources impact from implementation of the Preferred Alternative.

5.2.2.2 INTEC/MFC Existing Facilities Alternative (Alternative 2). Alternative 2 would modify the Decon Cell in the HFEF for Phases I, II, and III. Structural modifications to HFEF under this alternative would cause impacts to this National Register-eligible building. Prior to modifying HFEF, standard documentation methods developed for Category 2 buildings (e.g., large format [4 × 5] photos, gathering architectural and engineering drawings, and processing these records to archival standards) would be completed to ensure that the impacts are not adverse. The Category 2 requirements would be documented prior to making modifications to the HFEF Decon Cell.

5.2.2.3 INTEC Existing Facility and New Construction at MFC (Alternative 3). Alternative 3 includes modification of the NWCF Hot Cells for Phases I, II, and III. Either the HFEF Annex or the Mobile Hot Cell would be used for Phase IV. Implementation of Alternative 3 would not impact historic cultural resources.

5.2.2.4 MFC Existing Facility and New Construction (Alternative 4). Modification of the HFEF Decon Cell for Phases I, II, and III is proposed for Alternative 4. Therefore, historic cultural resources impact from Alternative 4 is the same as described for Alternative 2. Category 2 requirements would be documented prior to making modifications to the HFEF Decon Cell.

5.2.3 Waste Management

Under all of the alternatives, secondary waste generation would be minimal comprising a small fraction of overall INL Sitewide waste generation. It is estimated that small amounts of secondary (newly generated waste in excess of repackaged input waste) would be generated during life-cycle operations. Table 8 summarizes the types and amounts of waste to be shipped for disposal or interim storage, if a final disposal site is not available. The amounts are calculated assuming a 10-year operating period.

Waste minimization strategies would be implemented throughout the life-cycle of hot cell operations. Decontaminated or clean materials would be reused and recycled to minimize final waste disposal volumes.

Table 8. Estimated operational secondary waste generation and disposal.

Waste Type	Annual Waste Generation	Waste Disposition
Transuranic	1 m^3	Dispose of at Waste Isolation Pilot Plant
Low-level	5 m^3	Dispose of in Department of Energy or commercial low-level disposal facility
Greater-Than Class-C-Like	1 m^3	Store at Radioactive Scrap and Waste Facility
Hazardous	1 m^3	Recycled or returned to vendor

5.2.3.1 INTEC Existing Facilities Alternative (Alternative 1 [Preferred Alternative]). In addition to the operational waste (Table 8), the Preferred Alternative would generate waste from modification and decontamination activities to existing facilities. The FDP Hot Cell could be used to complete any of the Phases under Alternative 1. If old equipment, piping, and vessels are removed from the FDP Hot Cell, an additional 2 to 20 m^3 of waste could be generated. Remote decontamination efforts would be used to remove hazardous constituents and decrease the level of radioactivity. Both internal and external decontamination would be performed. The quantities and types of waste would depend on the success of the decontamination methods and identification of equipment for reuse. Based on decontamination evaluations, most of the newly generated waste is expected to be radioactive waste. Decontamination solution could be generated if equipment and piping requires decontamination before removal. The NWCF Cells would require some decontamination also. The decontamination actions would generate approximately 2,200 gallons of decontamination solution. Both of the decontamination solutions are anticipated to be MLLW based on past operations, and the solution would be sent to the Process Equipment Waste Evaporator, if it is available. Otherwise, the solution would be stored and then processed through the Integrated Waste Treatment Unit or disposed of off-Site at a commercial treatment facility.

5.2.3.2 MFC/INTEC Existing Facilities Alternative (Alternative 2). Waste generation from Alternative 2 would be similar to Alternative 1. Again, operational waste would be generated (see Table 8) and waste would be generated from modification and decontamination activities to existing facilities. Should decontamination solution be generated from use of the HFEF Decon Cell, it would be disposed of off-Site at a commercial treatment facility.

5.2.3.3 INTEC Existing Facility and New Construction at MFC (Alternative 3). This Alternative would use the NWCF Hot Cells for Phases I, II, and III. Phase IV would either be performed in a new constructed HFEF Annex or a Mobile Hot Cell. Therefore, large quantities of industrial waste would be generated from new construction activities. This waste stream would consist of typical construction debris that would be disposed of at the INL Landfill Complex. Small quantities of industrial waste would be generated from assembly of the Mobile Hot Cell. This waste stream would be disposed of at the INL Landfill Complex. Waste would also be generated from modification and decontamination activities of the existing Hot Cells in the NWCF. Operational waste is identified in Table 8.

Also, if the Mobile Hot Cell is used, it would require decontamination prior to return to the subcontractor. This waste stream would be radioactive waste and the quantity would be less than 5 m^3. Small quantities of decontamination solution would also be generated.

5.2.3.4 MFC Existing Facility and New Construction (Alternative 4). Waste generation from Alternative 4 would be similar to Alternative 3. Rather than using the NWCF Hot Cells for Phases I, II, and III, the HFEF Decon Cell would be used. Similar activities would be performed to modify the facilities in order to support the first three phases of the proposed action, which would generate similar modification and decontamination waste types and quantities. Industrial waste generation from new construction would the same as Alternative 3. Secondary operational waste is identified in Table 8.

5.3 No Action Alternative

The No Action Alternative would result in DOE missing legal and regulatory milestones, receiving penalties, and could impede DOE INL missions. In addition, removing the waste from belowgrade storage, and processing, repackaging, and disposing of the waste in an approved facility would reduce the risk to the environment, which the No Action Alternative would not achieve.

5.3.1 Air Quality

No impacts to air quality would result from the No Action Alternative.

5.3.2 Public and Occupational Health and Safety

All activities under the No Action Alternative would occur within existing RH waste-storage configurations. Adverse impacts to worker and public health and safety could occur if the waste liners in the RSWF failed because of long-term storage of the RH waste.

5.3.3 Cultural Resources

There would be no impacts to archaeological, Native American, or historic cultural resources under the No Action Alternative.

5.3.4 Biological Resources

Biological resources would not be impacted from the No Action Alternative.

5.3.5 Accidents

Because waste would not be actively managed under the no action alternative, accident scenarios were not evaluated. The HWMA/RCRA permit covering the RSWF waste management activities includes written contingency plans and prevention and preparedness plans. Those plans, as well as the MFC emergency plans for the RSWF, describe the response measures implemented during potential emergencies involving hazardous materials, RH waste, and mixed waste.

5.3.6 Intentional Destructive Acts

The DOE considered the possibility of intentional destructive acts. Existing security at the storage facilities makes such destructive acts extremely unlikely. The security system includes fences, alarms, electronic surveillance devices, vehicle barriers, and a trained security force. The greatest potential for an intentional act of destruction is from an authorized employee, however, the physical configuration of the waste, i.e., the construction and emplacement of the vaults and liners is very robust and a significant effort would be required to destroy one or cause a release of the liner contents.

5.3.7 Transportation

There would be no impacts from transportation actions under the No Action Alternative.

5.3.8 Waste Management

Under the No Action Alternative, all INL RH waste would remain in storage. Continued storage of MLLW would violate the INL Site Treatment Plan (INL 2008). An agreement would be required between the State of Idaho and DOE to continue storing MLLW. The Settlement Agreement (Idaho 1995) requires shipping all RH TRU out of Idaho by 2018. The Hanford Site would continue to manage the traps based on their NEPA decisions and other requirements. The No Action Alternative would generate no new waste streams.

5.4 Summary of Environmental Consequences of Alternatives

Tables 9 and 10 summarize the information provided in this section; however, only data that differ among alternatives are presented. These include transportation and public health.

Table 9. Potential transportation impacts based on total road miles for each alternative.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	No Action Alternative[a]
Transportation					
Total Road Miles	24,674	23,660	1,794	780	No impact
Total Driver Dose (49 CFR 173.441)	6,360 mrem	6,100 mrem	415 mrem	201 mrem	No impact

All RH waste would remain in storage. This may result in noncompliance with HWMA/RCRA regulations and existing operating permits. Failure to treat the waste and ship off-Site would result in noncompliance with the Site Treatment Plan and the Settlement Agreement.

Table 10. Summary of public health consequences that differ among alternatives.

Receptor Group	Alternative 1	Alternative 2	Alternative 3	Alternative 4	No Action Alternative[a]
Population within 50 miles					
Dose (person rem)	7.5×10^{-1}	7.5×10^{-1}	$1.2 \times 10^{+0}$	$1.2 \times 10^{+0}$	No impact
Cancer Fatality Risk (per year)	6.1×10^{-6}	6.1×10^{-6}	9.9×10^{-6}	9.9×10^{-6}	No impact
Maximally Exposed Individual					
Dose (mrem)	3.1×10^{-2}	3.1×10^{-2}	4.1×10^{-2}	4.1×10^{-2}	No impact
Latent Cancer Fatality Risk	1.9×10^{-8}	1.9×10^{-8}	2.6×10^{-8}	2.6×10^{-8}	No impact

a. All RH waste would remain in storage. This may result in noncompliance with HWMA/RCRA regulations and existing operating permits. Failure to treat the waste and ship off-Site would result in noncompliance with the Site Treatment Plan and the Settlement Agreement.

5.5 Cumulative Impacts

Cumulative impacts result when the effects of an action are added to or interact with other effects in a particular place and within a particular time. While they may be insignificant individually, cumulative impacts potentially accumulate over time from one or more sources, and can result in the degradation of important resources. Because federal projects cause or are affected by cumulative impacts, assessment of cumulative impacts is required under the National Environmental Policy Act (42 USC § 4321 et seq., 1970).

Environmental impacts from performing the proposed action were evaluated in the SNF & INEL EIS (DOE 1995a), specifically, Section C.4.6.6, "Remote Mixed Waste Treatment Facility." The evaluation included constructing a new facility (50 m long, 26 m wide, and 13 m high). The facility included an inert-atmosphere cell, hot repair area, covered truck loading area, equipment access area, control room and operating corridor, equipment transfer tunnel, and decontamination cell.

Impacts identified in this EA from each of the alternatives to the environment would be minor. Currently, no new projects have been identified that would contribute to the cumulative impacts addressed for the RWDP. The RWDP alternatives impacts would not contribute substantially to INL Site cumulative environmental impacts and are within those analyzed in the SNF & INEL EIS (DOE 1995a) for this work, see Section 5.15, "Cumulative Impacts and Impacts from Connected or Similar Actions."

5.5.1 Air Quality

Particulate emissions of radionuclides and toxic air pollutants would be abated using two-stage HEPA filtration systems for all of the alternatives. All of the alternatives are conservatively estimated to cause doses in the range of 0.031 to 0.041 mrem/yr. In the 8-year period beginning in 2000, INL Site-wide doses reported for National Emission Standards for Hazardous Air Pollutants (NESHAP) compliance (DOE-ID 2006) have ranged from 0.034 to 0.077 mrem/yr. Therefore, the cumulative impacts of the project are estimated to be in the range of 0.060 to 0.113 mrem/yr, well below the 10 mrem/yr NESHAP standard and well below the 0.63 mrem/yr cumulative impacts analyzed in the SNF & INEL EIS (DOE 1995a). Emissions of PM-10 during construction will be controlled as necessary to assure compliance with ambient air concentration standards. Emissions of particulate toxic and criteria air pollutants during operations would be minimal for all of the alternatives. Due to the waste's age and storage configuration, volatile chemical emissions are expected to be below regulatory thresholds for New Source Review permitting. Once an alternative is selected, a more thorough speciation and regulatory applicability determinations will be performed based on emission sources existing at the time.

5.5.2 Public and Occupational Health

The involved worker dose (based on releases during sorting operations) is the same for all the alternatives. Specific dose and risk calculations for the public are provided in Table 10. In recent years, INL operations have been estimated to cause annual doses in the range of hundredths of a millirem to members of the public (DOE-ID 2006). All of the proposed alternatives would potentially cause dose to the public much less than the potential dose caused by current INL operations. Appropriate engineering and administrative controls would be implemented to ensure worker and public protection.

5.5.3 Transportation

Transportation impacts for the hot cells located at MFC (HFEF, the HFEF Annex, or the Mobile Hot Cell) would be minimal based on the limited number of public road miles traveled. All but 31 waste shipments would be within MFC. The transportation impacts from the INTEC hot cells (FDP Cell or the NWCF hot cells) would include over 80 road closures and over 23,000 public road miles traveled. The most considerable impact from transporting the waste from MFC to INTEC would be to the driver during transit. The driver's exposure would be less than 6.7 mrem per shipment. Several engineering and administrative controls would be implemented to control the potential impacts.

Transportation impacts, including cumulative impacts for on-Site waste shipments, were evaluated in the SNF & INEL EIS (DOE 1995a), which provided a bounding analysis for performing the on-Site waste shipments (Section 5.11). For comparison, the largest number of waste shipments (Alternative 2) would be 821 shipments. The total number of INL waste shipments (all waste types) in 2007 was 2,819. The total number of shipments analyzed in the SNF & INEL EIS was 17,145. In addition, a supplement analysis to the SNF & INEL EIS was prepared in 2005 (DOE 2005b). The transportation analysis is addressed in Section 6.3.10 and shows the number of LLW shipments between 1996 and 2005 was 2,087. The supplement analysis documents that the actual total number of shipments currently completed are well below what was originally analyzed in the SNF & INEL EIS.

Neither this EA nor the SNF & INEL EIS analyzed the transportation impacts of transporting the FFTF RH-SCs from the Hanford Site to INL. That analysis is in the forthcoming "Tank Closure and Waste Management Environmental Impact Statement."

5.5.4 Waste Management

The total quantity of secondary waste generated from processing the RWDP waste would be 8 m^3 for all the alternatives. For comparison, 1,886.94 m^3 of waste was generated in calendar year 2007. (These amounts do not include waste generated as a result of decontamination or cleanup activities.) The cumulative impacts of waste generation analyzed in the SNF & INEL EIS (DOE 1995a) was 157,000 m^3 (Table 5-15-2 – Alternative B). Secondary waste generation for the RWDP is much less than what is analyzed in the SNF & INEL EIS.

The waste streams requiring processing would also be the same for all alternatives. There would be a difference in waste generation of deactivation and decommissioning waste generated from Alternative 1 (Preferred Alternative), Alternative 2, and Alternative 3 and new construction waste for Alternatives 3 and 4. Waste disposition has been identified for all the waste streams.

6. PERMITS AND REGULATORY REQUIREMENTS

In compliance with the Federal Facility Compliance Act (Public Law 102-386, 1992), DOE prepared a detailed Site Treatment Plan (INL 2008). The Site Treatment Plan established time tables for developing treatment technologies. It also identified existing or planned treatment capabilities and established milestones for the construction and operation of these facilities. Lastly, the Site Treatment Plan identified milestones for the treatment of backlog waste inventories. The proposed action would satisfy the Site Treatment Plan commitments.

The Site Treatment Plan delineates constructing and operating a waste facility as the path forward for the INL Site RH waste. The plan contains milestones based on the critical decisions associated with the waste processing facility, which culminate in a facility startup milestone date of 2012. Failure to comply with the milestones and terms of the INL Site Treatment Plan Consent Order can result in an enforcement action for administrative and judicial relief under the law, including fines. Additionally, the Settlement Agreement (Idaho 1995) stipulates that transuranic portions of this waste be shipped out of Idaho by a target date of December 31, 2015, and no later than December 31, 2018.

The EPA defines and identifies hazardous waste, establishes requirements for its transportation, treatment, storage, and disposal, and requires permits for hazardous waste activities. Section 3006 of RCRA (42 USC 6926) allows states to establish and administer these permit programs with EPA approval. The EPA regulations implementing RCRA are found in 40 CFR, Parts 260 through 282. The State of Idaho has authority to regulate hazardous and mixed waste within its boundaries in lieu of the federal regulations. However, Idaho’s hazardous waste program simply incorporates the federal regulations by reference through IDAPA 58, Department of Environmental Quality, Title 1, Chapter 1 (IDAPA 58.01.01). The CPP-666 RCRA Permit would be modified to address the use of the FDP Cell for the proposed action. The CPP-659 RCRA Permit would be evaluated to determine if modifications would be required for the NWCF hot cells. The MFC Sodium Process Facility and the Decon Cell in the HFEF are RCRA permitted. Modifications may be required to the permits to perform the proposed action. A new RCRA permit would be required for the operation of the HFEF Annex. Using the Mobile Hot Cell would require modifications to the existing MFC RCRA permit. In addition, the RSWF RCRA permit would be modified to address the interim storage facility and other proposed modifications.

Transportation of hazardous and radioactive materials and substances is governed by DOT, NRC, and DOE regulations. All waste would be shipped either in commerce under DOT and NRC regulations or out of commerce under DOE Order 460.1B requirements. Out-of-commerce shipments under DOE Order 460.1B would be described in a transport plan that demonstrates equivalent safety to the applicable DOT and NRC regulations.

A variety of laws, regulations, and statutes seek to manage or protect historic resources. Such resources include buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and or scientific importance. The requirements include the Antiquities Act of 1906; Reservoir Salvage Act of 1960; National Historic Preservation Act of 1966; National Environmental Policy Act of 1969; Executive Order 11593 (Protection and Enhancement of the Cultural Environment, 1971); the Archaeological and Historical Preservation Act of 1974, the Archeological Resource Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1990. Section 106 of the National Historic Preservation Act and its implementing procedures require federal agencies to take into account the potential effects of proposed projects on historic properties listed on or potentially eligible for the National Register of Historic Places.

In 2004, DOE-ID entered into a Programmatic Agreement with the Idaho State Historic Preservation Office, and the Advisory Council on Historic Preservation. The agreement implements the

“INL Cultural Resource Management Plan” (DOE-ID 2007), which tailors INL compliance with Section 106 of the National Historic Preservation Act and its implementing regulations (36 CFR Part 800) as well as various other cultural resource laws to meet the unique needs of the INL Site. DOE-ID’s “Agreement in Principle” with the Shoshone-Bannock Tribes ensures an active tribal role in cultural resource impact assessment and protection. If the T-25 Powerline Road route is implemented, Section 106 compliance would continue to develop a strategy to protect cultural resources from adverse impact. A Cultural Resource Protection Plan would be developed for the road improvements in consultation with the Idaho State Historic Preservation Office and Shoshone-Bannock Tribes. If historic properties at MFC are extensively modified, requirements outlined in the Cultural Resource Management Plan would be implemented.

Soil disturbing activities, including those associated with the use of unimproved roads, have the potential to increase noxious weeds and invasive plant species that would be managed according to the "Management of Undesirable Plants on Federal Lands" (7 USC Section 2814) and the Invasive Species Executive Order 13112. The INL would follow the applicable requirements to manage undesirable plants.

In analyzing the potential biological impacts of the use of T-25 Powerline Road for this project, DOE-ID has followed the requirements of the Endangered Species Act (16 USC Sections 1531 et seq.) and has reviewed the most current lists for threatened and endangered plant and animal species. Other Federal laws that could be applicable include: the Fish and Wildlife Coordination Act (16 USC § 661 et seq.), Bald Eagle Protection Act (16 USC § 668), and the Migratory Bird Treaty Act (16 USC Sections 715 to 715s).

The State of Idaho is authorized by the EPA (40 CFR 52) to manage criteria and toxic air pollutants through its State Implementation Plan. The plan includes IDAPA 58.01.01 and requires a permit-to-construct for any facility with the potential to release state-regulated pollutants that exceed a certain threshold. Radionuclide emissions are regulated under the federal National Emission Standards for Hazardous Air Pollutants Program (40 CFR 61, Subpart H). Criteria and state toxic air pollutants have the potential to be released during both the modification and operational phases, but are not expected to exceed ambient air quality standards or contribute to an unacceptable increase in pollutant levels for any of the alternatives.

7. LIST OF AGENCIES AND PERSONS CONSULTED

No other federal or state agencies were consulted during preparation of this EA.

Communications have been initiated with the Shoshone-Bannock Tribes and Idaho State Historic Preservation Office regarding cultural resource impacts, particularly those associated with the potential use of the T-25 Powerline Road. If the T-25 Powerline Road improvements are implemented, consultation will continue toward development of a Cultural Resource Protection Plan.

If consultation with the U.S. Fish and Wildlife Service is deemed necessary, that agency will be consulted.

If the HFEF Decon Cell at MFC is used, methodologies developed in consultation with the Idaho State Preservation Office and Advisory Council on Historic Preservation, as outlined in the “INL Cultural Resource Management Plan,” (DOE-ID 2007) will be completed.

8. REFERENCES

7 USC § 2814, 2006, "Management of Undesirable Plants on Federal Lands," *United States Code*.

10 CFR 61, 2005, "Licensing Requirements for Land Disposal of Radioactive Waste," *Code of Federal Regulations*, Office of the Federal Register.

10 CFR 61.55, 2005, "Waste Classification," *Code of Federal Regulations*, Office of the Federal Register.

10 CFR 835, 2007, "Occupational Radiation Protection," *Code of Federal Regulations*, Office of the Federal Register.

10 CFR 1021, "National Environmental Policy Act Implementing Procedures," *Code of Federal Regulations*, Office of the Federal Register.

16 USC § 661 et seq., 1960, "Fish and Wildlife Coordination Act," *United States Code*.

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Appendix A

Environmental Assessment for the Remote-handled Waste Disposition Project

Response to Comments

The formal comment period for the Environmental Assessment for the Remote-handled Waste Disposition Project ended on January 19, 2009. The comment period was extended to January 30, 2009, to accommodate a request DOE received from the Snake River Alliance. The DOE received several comments from interested parties and groups. Several of the comments were similar in nature or subject matter, therefore, they were evaluated and consolidated according to the subject. The comments have been reprinted verbatim as received by the DOE. The following pages contain DOE's responses to the comments. This document is being prepared as an appendix to the EA and will be provided to those individuals and groups who provided comments. It will also be available on line and to other interested parties upon request.

Comments have been organized in the following categories. Under each category is a list of the comments in numerical order and the commenter.

Waste Description

1. Comment:
The Tribes, in general, support the treatment and export of nuclear waste from INL as this proposed project will undertake. However we have some fundamental concerns with this draft E.A. The E.A. document provides that GTCC waste, MLLW and RHLLW waste may end up being stored or disposed of at the INL. The Tribes object to the INL being the permanent repository for these wastes. With the final disposal decision pending on GTCC waste, there is concern that the INL may be the site for disposing this waste.

1. Response:
DOE acknowledges your concern with regards to the final disposition of these waste streams. However, the EA does not propose that the INL dispose of any of these wastes on-site other than the RWMC, which is an approved disposal facility for RH LLW (Figure 7). It does allow for the storage of these wastes until the final disposal paths have been identified. There is one disposal path that is currently open for the disposal of MLLW but it is scheduled to close prior to the generation of most of the MLLW. It is possible that the facility could remain open longer but it is unlikely at this point. This EA is not intended to support the decision regarding the final disposition of GTCC wastes; however, DOE has begun the process to make disposal decisions for GTCC wastes by issuing a Notice of Intent to prepare an Environmental Impact Assessment. DOE acknowledges the current lack of disposal options for some of the waste. It is important to process the waste for which disposal is available and dispose of it as soon as practicable.

2. Comment:
The EA fails to distinguish or estimate the TRU waste that would meet the “defense-based” waste acceptance criteria at WIPP. The answer to the question: “Which project or facility that contributed to the waste inventory meets the WIPP definition of ‘defense waste’?” is not answered in this E.A. A better description of the wastes need to be provided, and an estimate of which facility that produced the waste was carrying out “defense-based” work, so one can determine if such waste would meet the WIPP-Waste Acceptance Criteria (WAC). An estimate of WIPP acceptable, and WIPP-not acceptable TRU and MTRU waste mass should be provided in the E.A. An excerpt of the WIPP requirement is found below:

> A TRU waste is eligible for disposal at WIPP if it has been generated in whole or in part by one or more of the following functions (References 18 and 19):
> • naval reactors development
> • weapons activities, including defense inertial confinement fusion
> • verification and control technology
> • defense nuclear materials productions
> • defense nuclear waste and materials by-products management
> • defense nuclear materials security and safeguards and security investigations
> • defense research and development
> Using AK, DOE sites must determine that each waste stream to be disposed of at WIPP is "defense" TRU waste.

The process for determining whether waste, particularly transuranic waste, is defense or non-defense must be discussed in detail. Non-defense waste cannot be sent to WIPP. Furthermore, the “guideline” that any defense waste co-mingled with non-defense waste in a single container makes it all defense waste has not always been in effect. A first requirement is that the generation dates of all waste be included in the waste inventory. What happens if any of the TRU or MTRU is determined to be non-defense?

2. Response:
DOE believes that all of the TRU and Mixed TRU waste will be defense related. However, as identified in the body of your comment, Acceptable Knowledge (AK) is the process through which the "defense" basis is documented. DOE has begun the AK process on the portion of the waste stream that will be treated in the first phase of the project. This waste was generated at the Naval Reactors Facility. Definitive approvals will be obtained from the WIPP before any waste is shipped there for disposal. Any waste that is determined to be "non-defense" will be stored in an appropriate storage facility on the INL until a compliant disposal option is determined.

3. Comment:
Are there any concerns regarding co-mingling, given the fact that the hot cell is already grossly contaminated and the piping system still has residual material?

3. Response:
No. The piping system lines and process vessels have been flushed as part of an effort to recover all of the accountable material in system. Even without flushing, any such material would never come into contact with repackaging activities. Surface contamination within the cell will have no impact to repackaging of waste into new containers for waste characterization and shipment to the WIPP.

4. Comment:
Perhaps the greatest flaw of the draft EA is the paucity of detail on the waste covered by this project. That single gap reverberates throughout the draft assessment. I understand that the liner-by-liner inventory won't be completed until June, but the specifics of the waste obviously have an effect on the impacts associated with its exhumation, transportation, handling and processing, and on its disposition, the point of this project.

4. Response:
The analysis in the EA is based on the available information and is sufficient to make a decision on significance of environmental impacts. DOE has generated a significant body of knowledge, data and details on the waste subject to this project over the many years of operations that generated it, and from on-going inventory activities. It was not necessary for DOE to include more specific details on the wastes in this EA to convey the important results of the impact analyses and to keep the project understandable to the general public, consistent with the spirit and intent of NEPA.

5. Comment:
Spent fuel must not be sent to the Waste Isolation Pilot Plant or to a commercial disposal facility. What specific steps are planned to ensure that even a very small amount of SNF will not be disposed of inappropriately?

The notion that LLW and SNF might be in the same waste storage facility, let alone the same silo, raises management questions. How much waste is being left at the Radioactive Scrap and Waste Facility? What are the plans for that waste?

5. Response:
The project does include a mixture of different types of waste. A primary purpose of the project is to segregate waste into appropriate waste types. It is during this segregation process that any comingled SNF will be stored until it is managed in accordance with the Final Environmental Impact Statement for the Treatment and Management of Sodium Bonded Fuel (DOE/EIS 0306), dated July 2000, and its subsequent Record of Decision , 65 FR 56565, September 19, 2000. DOE will ensure that all SNF is appropriately disposed. All of the waste at the RSWF will be configured to facilitate proper disposal. Some of the waste may have to be stored until disposal paths become available.

The specific steps to ensure SNF is not disposed of inappropriately include the AK process, the accountable material process, Real-Time-Radiography, and visual examination. These steps are part of the WIPP certification process.

6. Comment:
I understand that about 21 cubic meters of remote-handled transuranic waste are included in this project. I also understand that one container of RH TRU is above WIPP's acceptance level of 1,000 rem/year. What will happen to that waste? I note that diluting it is irresponsible.

6. Response:
There are several options for dealing with this scenario:
In meeting WIPP Waste Acceptance Criteria (WAC), AK will be developed for the contents of each Liner. The AK is a WIPP WAC term and is required to be developed, recorded and be approved in accordance with a certified AK Collection Program. The AK provides a pedigree of the contents based on historical records of what was loaded into the Waste Liner (WL). This information will be thoroughly reviewed prior to the processing of given WLs to determine what contents could be problematic for meeting the WAC. As an example, if a liner has a contact reading of 1,000 R when it was placed in RSWF a number of years ago, the rate of decay can be calculated to determine the expected current contact reading which will be less than the initial 1,000 R. Additionally, based on the AK, there could be a limited amount of material that is contributing to the high R values that could be classified as Greater than Class C Like Waste (GTCC-like) such as a fuel assembly husk, (i.e., the outer metal structure housing fuel rods). Such waste would be segregated out for return to MFC for long term storage until a repository for GTCC is established. The other waste in the WL meeting the WAC would be repackaged and shipped to WIPP. Utilizing this methodology along with the RH TRU Waste Characterization Program, one can be assured that only RH TRU will be shipped to WIPP and that all such waste will meet the WIPP WAC.

7. Comment:
There may well be waste from pyroprocessing covered by this EA. How is it classified? What are its generation dates?

What wastes will be produced by any processing? In what quantity? How and where will they be disposed? What emissions[sic]

7. Response:
Several of the sodium treatment processes discussed would generate a sodium hydroxide waste stream, which would be neutralized and solidified to meet disposal criteria as LLW. The MEDE process, however, would generate elemental sodium that would be treated at existing MFC facilities (3.1.2.3).

The secondary wastes to be generated have been identified in Section 5.2.3. Figure 6 identifies the disposal options for the different types of waste. Emissions are covered in Section 5.1.1.

8. Comment:
Is my understanding correct that the older waste packages were successfully overpacked?

8. Response:
Yes. All of the older liners have been successfully transferred to larger liners. The affected liners are discussed in some detail in Section 2.2.1.2.

9. Comment:
The range of problems and potential releases that might be encountered when waste is removed from the silos must be analyzed fully. Will be produced[sic]? How will they be controlled?

For instance, the waste inventory will not be complete until June. It's not apparent that the potential difficulties of waste exhumation at RSWF have been analyzed.

9. Response:
DOE is conducting a definitive inventory at this time. Performing the work in phases allows for work to initially proceed on the best characterized liners while additional characterization continues on the rest of the liners. Section 5.1 explores the most likely and adverse of situations that might be encountered during performance of this project. DOE has extensive experience with managing the waste in storage subject to this EA, and will bring this to bear, in addition to applying conservative safety requirements to all exhumation activities.

<u>Alternative Selection:</u>

<u>1. Comment:</u>
Is the equipment in the hot cells adequate to do the job? In other words does the project look good on paper but is not feasible in the field.

Permanent infrastructure should not be constructed for a short term project as long as alternatives are available.

<u>1. Response:</u>
In some cases, the equipment is adequate. In other cases, the equipment will require modifications or replacements as described in Sections 3.5.1 and 3.5.2. It is feasible to perform the project in existing cells using some existing equipment.

<u>2. Comment:</u>
As a concerned citizen who is interested in the high cost of completing this project, I wish to recommend that DOE take a second and closer look at the at the no action alternative. It seems a possibility that this waste could be left as is, in the cylinders and simply grout them in place. Then the whole field of 90 some cylinders could be capped. The would accomplish a much cheaper and safer handling of this waste. While I know it would not be in keeping with the agreement to have this waste out of the State, it would certainly be a cheaper means of handling the problem. I simply want to ask that DOE consider this as a good alternative.

<u>2. Response:</u>
The alternative you raise basically constitutes permanent in-place disposal. The DOE acknowledges the substance of this comment. There are several waste types in storage that are within the scope of the RWDP and this environmental assessment. "Mixed waste" project materials include transuranic radioactive and hazardous components that are governed by the RCRA hazardous waste regulations administered by the State of Idaho. These wastes were generated as a result of INL operations after the RCRA was enacted. As such, waste generation and treatment, storage and disposal activities are controlled by operating permits. There are no options within the current RCRA regulatory framework to allow permanent disposal at the MFC location. Failure to treat the waste and ship off-Site would result in noncompliance with current RCRA regulations, permits; and the INL Site Treatment Plan and the Settlement Agreement negotiated with the State to address certain waste management issues. Congress has mandated a national policy to dispose of atomic energy defense related transuranic and mixed transuranic wastes at the WIPP in Carlsbad, New Mexico.

A portion of the waste inventory also may contain co-mingled spent nuclear fuel rods. Spent nuclear fuel that is recovered by the project must be stored until it is managed in accordance with the Final Environmental Impact Statement for the Treatment and Management of Sodium Bonded Fuel (DOE/EIS 0306), dated July 2000, and its subsequent Record of Decision, 65 FR 56565, September 19, 2000.

The waste inventory also includes a subcategory referred to as GTCC-like waste. The GTCC-like waste is DOE waste that exceeds the NRC’s Class C concentration limits for LLW radionuclides and the TRU concentration limits. Final disposal for GTCC-like waste is not currently available. DOE published a Notice of Intent on July 23, 2007 (DOE 2007). The Notice of Intent states DOE’s intention to prepare an environmental impact statement for a proposal to establish a disposal facility for GTCC low-level radioactive waste, which will include GTCC-like waste. The GTCC-like waste would be stored on-Site until this facility is established and becomes available.

RH-LLW, however, may be disposed in accordance with DOE Order requirements at the facility that generates it. The project waste inventory contains considerable amounts of LLW. DOE anticipates preparing a NEPA evaluation regarding additional RH-LLW disposal capacity for the INL in a future NEPA document as identified in the DOE Idaho Operations Office's 2008 and 2009 Annual NEPA Planning Summary, which is available to the public. The waste within the scope of that NEPA document would include all remaining RH-LLW in storage at the RSWF and predicted future quantities of RH-LLW which are out of the scope of this EA. Evaluating the environmental impacts of various alternatives for disposal, including locating, constructing, and operating a new RH-LLW disposal facility on the INL, is not yet ripe for a NEPA evaluation and out of the scope of this EA.

Transportation

1. Comment:
The Tribes are also concerned that the DOE is building up the shipment of waste (both treated and un-treated) across the Fort Hall transportation corridor. The build-up of shipping rates across the Reservation should trigger a re-evaluation of the funding needed for the Shoshone-Bannock Tribes to respond to a transportation incident in Fort Hall.

1. Response:

The Department has been proactive in engaging the Tribes in discussion and consultation, when necessary, of issues with potential impact to their culture or their sense of well being and safety. DOE remains committed to compliance with the tenets of the Agreement in Principle (AIP), negotiated between the Department and the Shoshone-Bannock Tribes; the Department's American Indian and Alaska Native Tribal Government Policy; and is an advocate of Tribal sovereignty and self determination. During the last few years, the Department has been closely involved in participating and assisting with the Tribes' objectives to develop a very competent emergency response system. This includes the purchase of equipment resources and training for the Tribes' first response capabilities, that include a Level A Hazardous Materials Response Team. The Tribes have the ability to track all Departmental shipments of hazardous waste by the TRANSCOM system, and are participants in writing transportation and shipping plans for hazardous shipment campaigns. The DOE believes that the funding agreement for the AIP annually provides resources for maintaining the capability to respond to transportation emergencies.

2. Comment:
The CAB supports the preferred recommendation using the existing public road with temporary closures (Highway 26) due to the high costs of establishing a new road and the possibility of disturbing cultural resources. The CAB further recommends that during closure, community and site emergency vehicle provisions be evaluated and addressed.

2. Response:
The nonroutine shipments (3.1.2.2) on U.S. Highway 20 will undergo an extensive safety analysis and review process to ensure proper safety plans are developed and implemented. Out-of-commerce (nonroutine) shipments under DOE Order 460.1B will be described in a transport plan that demonstrates equivalent safety to the applicable DOE and NRC regulations.

Safety

1. Comment:
The Tribes are very concerned that some of the waste, especially the sodium-bearing waste is ignitable. There is concern that opening up some of the liners and cans could result in a fire that could disperse radionuclides together with toxic fumes.

1. Response:
Elemental sodium and NaK do present some unique fire risks as they are both water-reactive. They do not spontaneously combust. The atmosphere in the FDP cell and HFEF cells are maintained with very low humidity as to reduce the risk of fires. Additionally, special fire protection equipment is planned for the cells to address the special risks associated with elemental metal fires. DOE is committed to maintaining a safe workplace and will not do work unless it is completely analyzed, safe, and compliant.

There is no intention of opening containers except in shielded cells with 2-stage high-efficiency particulate air filters. There is considerable experience with processing sodium-contaminated radioactive material. The Materials and Fuels Complex has a RCRA permitted treatment unit that has been treating elemental sodium for many years. The risks associated with the treatment of elemental sodium and NaK are well known.

The potential impacts of a sodium fire in the RWDP process cell were evaluated for the waste container holding the largest amount of sodium, i.e., 1,500 lbs. Consistent with the assumptions used for facility safety classification, 10% of the sodium fume was assumed to be released from the process cell. Based on ISC/ST model dispersion calculations for MFC (releases from INTEC would cause somewhat lower concentrations), a short-term release caused by burning 1,500 lbs of sodium would cause a 28 microgram/m^3 air concentration (8-h averaged) of sodium hydroxide fume at the publically accessible location where the highest air concentrations occur (Highway 26). This concentration is 14% of the occupational exposure limit (OEL, the 8-h time weighted average exposure limit for workers) per IDAPA 58.01.01.585. The IDAPA 24-h averaged acceptable ambient concentration (AAC) for sodium hydroxide fume is 100 microgram/m^3. Modeling with ISC/ST indicates that burning 1,500 lbs of sodium would cause a 3.9 microgram/m^3 24-h averaged air concentration at Highway 26. Most of the waste containers hold much less (or no) sodium or NaK. Based on information in EDF-8158, of a total of 430 containers holding sodium-contaminated waste, 419 contain less than 6 pounds of sodium. Eleven containers hold between 6 and 66 pounds of sodium. The remaining sodium is contained in 3 components that hold between 600 and 1500 pounds of sodium.

The hazard posed by sodium fires is adequately addressed by estimating radiological impacts only. The consequence analysis for a molten sodium fire (EDF-9070) assumes that, of containers holding sufficient sodium to pose a fire hazard, the container with the inventory posing the greatest radiological hazard (608 Ci of Cs-137; trace amounts of other radionuclides) is involved in a fire that causes complete combustion of the sodium. Consistent with the assumptions used for facility safety classification, 10% of the radioactive contamination is assumed to be released from the process cell. The resulting off-site dose was estimated to be 1.7 mrem.

In summary, if there were a release of radioactively contaminated sodium fume to the ambient air, the hazard to the public posed by the fume (soluble sodium hydroxide) generated by any of the 430 containers would be small. The contaminated fume would have a distinctive chemistry, but the radiological dose models for inhalation use the ‘worst-case’ assumption with respect to particle chemistry, so the effects of exposure to a radioactively contaminated sodium hydroxide fume are conservatively estimated.

2. Comment:
The safety of the workers is of the highest concern with high radiation exposure and radioactive contamination as they perform their operation to the Fluorine Dissolution Process (FDP) facility. There may be times for possible contamination as they place the casks or canister for entry into the FDP cell as well as removing the waste from the FDP cell. Personnel should use the best practice as they perform these operations.

Worker safety is always a concern when working with remote handled waste. Every step should be taken to ensure workers are protected.

Once the containers/liners are in the hot cell and being prepared to be opened, given the somewhat unknown contents, how are safety issues going to be addressed. Particularly protection from fire and explosions.

As the Department of Energy (DOE) moves forward to process RH waste, the DEQ encourages it to provide for a high level of worker safety. The DEQ also encourages DOE to employ cost effective means in carrying out the proposed action so that it can be done both safely and expeditiously.

2. Response:
For worker protection, several controls are in place as required by 29 CFR 1910 (2007) and other applicable safety regulations and implemented by procedures and manuals. Additional controls to manage a fire would be defined in the Fire Hazard Assessment and implemented by a combination of engineered design features (e.g., metal fire extinguishers), procedures, training, and staffing. All workers would be fully trained and qualified for their roles and responsibilities. Workers would attend pre-job briefings on cell operations, the associated hazards, and the critical importance of proper handling of hazardous materials. If additional actions are required, such as hydrogen venting, they will be incorporated into the work steps.

Potential safety issues such as fires and explosions will be evaluated against the facility safety documentation. Safety analyses would be performed to address hazard and accident analyses for processing RH waste and scrap materials. In addition, HWMA/RCRA permits covering RH waste management activities would include written contingency plans and prevention and preparedness plans. Those plans, as well as the applicable facility emergency plans, would describe the response measures used to deal with potential emergencies involving hazardous materials, RH waste, and mixed waste.

Specific FDP work control documents and radiological controls will be implemented to ensure compliance with Idaho Cleanup Project (ICP) procedures and best management practices.

3. Comment:
As the project develops and as equipment modifications within the CPP-666 FDP facility and the upper level of the Hot Cell are identified, the CAB recommends that the engineers consult with experienced operators in reference to past experience on what will work best for them as they perform their operations.

3. Response:
Project engineering is soliciting input from former FDP operators with past hot operations experience.

4. Comment:
The CAB recommends that “lessons learned” be reviewed in reference to past and continuing operations conducted with the Remote Handled Transuranic Waste Program. These “lessons learned” may refer to problems and successes the program has experienced.

4. Response:
The operational personnel associated with the RWDP and directly involved in the planning for these operations, and the lessons learned are transferred between the projects. ICP also has a formal lessons learned process to ensure that lessons learned are disseminated to the appropriate people.

5. Comment:
If inexperienced personnel will be used at the FDP area, the CAB suggests a training program that includes all aspects of the operations and hands on training for the current equipment at the CPP-659 facility.

5. Response:
A formal training plan with operations qualification and hands-on practical training will be administered for these operations.

Analysis Related - Air

1. Comment:
Page 29 of the proposed Environmental Assessment document, where it calmly reveals there will be an uncontrolled release of 1045 Curies of tritium in gaseous form during the proposed processing, and no discussion whatever of the fate of this enormous amount of radioactive material in the biosphere. I suspect all this material will remain in the biosphere as tritiated water, and what will be its cumulative impact? We are not sufficiently informed by the proposed Environmental Assessment, in fact, we are not informed at all.

1. Response:
The impacts of tritium emissions were estimated assuming that it would be released as tritiated water. For each alternative, the EPA's CAP88PC, version 3.0 code was used to calculate the greatest dose that might be received by any one member of the public, as well as the cumulative dose to all members of the public within 50 miles of the emission points considered for each alternative. The CAP88 model accounts for dose caused by food consumption, thereby addressing tritium in the biosphere as it affects dose to the public. With respect to cumulative effects on the biosphere in southeast Idaho, the total amount of tritium released by this project is roughly equal to the amount of natural tritium in the precipitation falling each year over 460 square miles in our region. Its fate would be to enter the hydrologic cycle, with most of the tritium either dispersing from the region in the atmosphere or entering relatively slow-moving water in soil beyond the root zone. Again, the impacts to the biosphere caused by the small fraction of tritium that is incorporated in biota are indicated by the very small projected doses to humans caused by food ingestion.

2. Comment:

Air quality needs to be closely monitored to ensure the filtration system has not been breached or compromised in any way. We would like to participate in the air quality monitoring.

2. Response:
An extensive stack monitoring system will be designed to check the effectiveness of the filtration system. Monitoring will be required by DOE Order and by the EPA National Emissions Standard for Hazardous Air Pollutants. Reporting is required and annual regulatory inspections are conducted. Air quality monitoring also typically involves analysis of samples collected from ambient environmental air. This is an effective way to verify that air quality at locations of interest (e.g., population centers) meets standards and the expectations of stakeholders. There is an extensive ambient air monitoring program at INL (Stoller-ESER acting as site-wide Point of Contact) with samplers at many locations of interest. DOE Environmental Management programs will work with the DOE-ID Tribal Liaison Officer within the context of the existing Working Agreement between DOE and the Shoshone-Bannock Tribes to identify opportunities for Tribal involvement in future air quality monitoring activities.

<u>Analysis Related – Archaeological</u>

<u>1. Comment:</u>
5.1.3.1 Archaeological Cultural Resources-The Tribal D. O. E/Cultural Resources staff visited the T-25 road in December 2008 and received a briefing from DOE Archaeologists in their findings of their pedestrian survey of the project area. There are several archaeological sites located within and close to the T-25 road. All avenues must be taken to ensure avoidance and protection of these important archaeological sites within the project area. The T/DOE Cultural Resources office must be included **<u>from the beginning</u>** in the development of a Protection Plan as stated in the Draft E. A. Additionally, the T/DOE Cultural Resources Office needs to be a participant should test excavations be conducted, per the 2007 Agreement-In-Principle between the Shoshone-Bannock Tribes and the Department of Energy.

The Idaho National Laboratory lands were once, and are still considered valuable in the sense of providing healing plants, substinence, and spirituality. The Department of Energy Idaho Operations Office and project contractors need to ensure that all cultural resources laws, DOE Orders and Executive Orders with regard to protection of cultural resources are complied with.

<u>1. Response:</u>
DOE-ID and INL site contractors are committed to complying with applicable requirements for management of cultural resources during INL projects such as the RWDP and appreciate the need and opportunity to interact directly with the Shoshone-Bannock Tribes regarding resources of importance to them. This ongoing commitment to direct involvement will continue as the RWDP project moves forward. Archaeological resources are managed at the INL in compliance with the Idaho National Laboratory Cultural Resource Management Plan (DOE/ID-10997, Rev 2, February 2007).

<u>Analysis Related – Biological Resources:</u>

<u>1. Comment:</u>
Sensitive Plant Species: According to the EA, approximately 1/3 of the habitat along the East Powerline Road between the MFC and CITRC is relatively healthy and intact sagebrush steppe. According to Hafla et. al. (2008), another 1/3 could be characterized as early seral sagebrush-steppe, recently impacted by a fire but likely to return to high quality habitat if protected. Despite the presence of high-quality native habitat, little reference was made in the EA about the presence of sensitive plant species. There are a number of sensitive species potentially occurring within the area of impact including the globally imperiled meadow milkvetch and Welsh's buckwheat. A comprehensive assessment of the understory composition that accompanies the existing shrub-steppe communities could help predict the level of impact upon species of concern. If the populations of sensitive species are significant we would urge you to seek an alternative that does not require the road upgrade.

<u>1. Response:</u>
The EA has been modified to incorporate the following language: "Six sensitive plant species have the potential to occur in the area to be affected by the upgrade of T-25 Powerline Road based on the habitat requirements of those species. Those species include *Atragalus aquilonius* (Lemhi milkvetch), *Astragalus diversifolius* (meadow milkvetch), *Camissonia pterosperma* (wing-seeded evening-primrose), *Catapyrenium congestum* (earth lichen), *Eriogonum capistratum* Rev. var. *welshii* Rev. (Welsh's buckwheat), and *Ipomopsis polycladon* (spreading gilia). Surveys for these species have not been conducted and no information is available regarding the potential for the proposed action to impact them (DOE 2005a and Hafla et al. 2008)." DOE will consider this lack of information when making a determination on the project alternatives.

2. Comment:

Invasive and Non-Native Species: The EA clearly addresses the potential for increased introduction of non-native species associated with both the road upgrade and the seasonal use of the road. The EA also recognizes the difficulties associated with re-establishing native species including sagebrush once they have been removed or destroyed. Non-native species represent one of the greatest threats to the long term integrity of shrub-steppe communities. Though there are currently only a few non-native plants found in this region of the INL, the number would increase dramatically with any construction effort. Though many weeds can be controlled with herbicides and vigilant monitoring, it is usually best to avoid disrupting the soil at all. TNC would support any and all efforts to reduce the amount of soil disturbance, and would prefer an alternative that avoided disturbance altogether.

2. Response:

The EA noted the potential risk for invasive species introduction and the potential for impact to native plant communities and wildlife relying on those communities. DOE would implement weed control actions and re-vegetate as appropriate. If the powerline road was upgraded, DOE would make every effort to reduce soil disturbance to the minimum possible.

3. Comment:

Wildlife: There are likely many species of wildlife using the area surrounding the East Powerline Road. Some, as noted in the EA, are using this region as transitional habitat during migration or dispersal and others are residents. It is likely that most of the wildlife species found in this part of the INL are attracted by the large intact and healthy shrub-steppe community. The proposed road upgrade will fragment the existing communities and likely disrupt the movements of the wildlife species. Though the EA notes there are no federally threatened or endangered species found in the area, TNC is extremely concerned about several sensitive species including sage grouse, pygmy rabbit, ferruginous hawk, Swainson’s hawk, sage sparrow, elk, mule deer and pronghorn. Though not endangered, a few of these species are on the brink of being listed and additional habitat loss or fragmentation could make a large difference in their decline or recovery.

In their review of the potential impacts of the road upgrade Hafla et al. identified four active sage grouse leks, and three historic leks within 5km of the existing road. They also identified a number of pygmy rabbit burrows in close proximity to the existing road. The likelihood of the road covering a sage grouse nesting site or a pygmy rabbit burrow is slim, but the disturbance of the construction activities as well as the traffic associated with construction and use of the road will have a great impact on these sensitive species. Vehicle traffic will also be a source of direct mortality for many animals. The proposed 15 mph speed limit will do much to prevent vehicle collisions with large game and some birds, but will likely not protect small mammals and reptiles.

3. Response:

The EA has been modified to include the latest information available on sage grouse and pygmy rabbits. The EA also noted the unavoidable impacts to wildlife associated with road construction, and actions that can reduce the effects of these impacts if successfully implemented. Both the ferruginous and Swainson’s hawk have been documented to nest on the power line along T-25 as well as the Utah juniper (*Juniperus utahensis*) trees scattered along this road. The increased noise, activity and dust from additional traffic along T-25 could adversely impact both of these species by causing displacement from current hunting and nesting areas or nest abandonment. Collisions with vehicles are also possible. The EA has been updated to address these potential impacts. It is unlikely that sage sparrow, elk, mule deer or pronghorn would be impacted by the road upgrade as long as control measures are in place. Should any of the sensitive species noted above be listed for protection under the Endangered Species Act, DOE will enter into formal consultation with the US Fish and Wildlife Service. The potential to impact species that could be protected under the ESA and the potential impacts of that listing to the project will be considered in determining a course of action with regard to upgrading T-25 Powerline Road.

4. Comment:
In summary, TNC believes that there would be significant impact to the wildlife species and plant communities from the road upgrade. Additionally the EA suggests improving the road would attract other traffic between the MFC and CITRC and would encourage other infrastructure development in this area. These so called "cumulative impacts" would further increase habitat fragmentation, increase the spread of invasive species and accelerate the loss of native species. We understand that the road upgrade is only a small portion of the EA and the RHWD project, but we feel that the full impacts of this road upgrade were not fully considered in the EA. We also understand that the project can continue without the road upgrade. We would like to see traffic between the MFC and CITRC utilize the existing roadways, notably Highway 20. Though this would increase the driving distance between the MFC and CITRC, no additional roads would have to be built or upgraded and no habitat would be converted.

It is the Upper Snake LWG's understanding that DOE is considering two options for transporting radioactive material between two facilities located within the boundaries of the Idaho National Laboratory. One option would transport waste along State Highway 20 – which is a public road – and the other would necessitate upgrades to T-25 Powerline Road, an existing two-track road that is not accessible to the public. It is our understanding that Highway 20 would have to be closed to public use for short periods of time in order to transport the radioactive material because the containers for the radioactive materials cannot be used on commercial (public) roads under existing regulations. One perceived benefit of upgrading the two-track road is that it would have less impact on the public, although the LWG notes that Highway 20 closures could be scheduled (i.e., in the middle of the night) to minimize inconvenience to the public and disruption of public use.

As you are likely aware, the U.S. Fish and Wildlife Service is currently reviewing the status of the Greater sage-grouse for potential protection under the Endangered Species Act. The Service initiated this review to take into consideration relevant information that has become available since its 2005 finding that the Greater sage-grouse did not warrant protection under the Endangered Species Act at that time.

The *Conservation Plan for the Greater Sage-grouse in Idaho* (2006), which covers the entire state of Idaho, was developed to address 19 threats to sage-grouse populations and habitat. A panel of six scientists[d] with expertise in sage-grouse, range, fire, and landscape ecology ranked the 19 threats for the state as a whole and concluded that impacts from linear infrastructure, including roads, is the second highest ranked threat to sage-grouse in Idaho.

4. Response:
With regard to the T-25 Powerline Road, the EA mentions the potential use of this road by other projects in the future. Vilord et al. (2005) and Hafla et al. (2008) noted the likelihood of this road upgrade encouraging future development and the potential for risk to biological resources associated with those developments. Analysis of development due to the road upgrade would be speculative since there are no known proposed projects for this area in the foreseeable future. This will be taken into consideration in determining a course of action with regard to upgrading T-25 Powerline Road.

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d. Panelists included Dr. Steve Bunting, Professor, Department of Range Science, University of Idaho; Dr. Jack Connelly, Principal Wildlife Research Biologist, Idaho Department of Fish and Game; Dr. Steve Knick, U.S. Geological Survey/Biological Resources Division; Dr. Karen Launchbaugh, Chairperson, Department of Range Science, University of Idaho; Dr. Kerry Reese, Professor, Department of Fisheries and Wildlife, University of Idaho; and Dr. Mike Scott, Leader, Cooperative Fisheries and Wildlife Research Unit, University of Idaho.

5. Comment:
Sage-grouse are found within the boundaries of the Idaho National Laboratory and the portion of Idaho National Laboratory that lies north of Highway 20 falls within the Upper Snake Sagegrouse Planning Area. After careful review of the EA and the potential impacts on sage-grouse populations found on the site, the Upper Snake LWG concluded that the alternative that would result in fewer negative impacts on sage-grouse would be to use the existing public road, Highway 20. The LWG reached this conclusion based on several factors:

• *Direct habitat loss*. Construction activities to support upgrading the two-track road could directly eliminate up to 150 acres of sagebrush habitat.
• *Indirect habitat loss*. Besides the direct impact of habitat loss, there is often an indirect impact that reduces the total area available as habitat that is associated with roads. According to the *Conservation Plan for the Greater Sage-grouse in Idaho* (2006), these zones of influence have the potential to negatively impact sage-grouse populations. As a result, we would expect that sage-grouse use would decline closer to the road. We suggest consulting Wisdom et al (2000)[e] for further discussion about zones of impact.
• *Habitat fragmentation*. Development of this road would also increase habitat fragmentation. Due to its close proximity to Highway 20, the area between the improved road and the public highway would likely no longer provide sage-grouse habitat because the zones of influence from the two roads would overlap.
• *Weeds*. The potential for noxious weed infestation increases with soil disturbances associated with construction activities.
• *Road-kill*. To the extent that sage-grouse continue to use the area, the potential for collisions would increase with increased traffic.

The Upper Snake LWG members believe that periodic road closures on Highway 20 could be scheduled and publicized in a manner that would minimize the potential for public inconvenience. It is our understanding that in emergency situations (like an ambulance from Arco attempting to transport a patient to a hospital in Idaho Falls), an emergency vehicle could be allowed to pass through during a transportation event because the radiation would pose little risk to the occupants.

5. Response:
DOE is in agreement that the potential impacts of the Remote-handled Waste Disposition Project to biological resources would be essentially eliminated by use of Highway 20 rather than upgrading T-25 Powerline Road. This will be taken into consideration in determining a course of action with regard to upgrading T-25 Powerline Road.

6. Comment:
If DOE decides to select the other option and implement upgrades to T-25 Powerline Road, the Upper Snake LWG recommends the following actions to mitigate/minimize the impacts on sage grouse and sage-grouse habitat:

• *Timing of construction.* DOE should consider the not-yet-published research conducted by the Wildlife Conservation Society (WCS) to determine a schedule for construction that would minimize disturbance to known sage-grouse populations.[f]

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e. Wisdom, M.J., R.S. Holthausen, B.C. Wales, C.D. Hargis, V.A. Saab, D.C. Lee, W.J. Hann, T.D. Rich, M.M. Rowland, W.J. Murphy, and M.R. Eames. 2000. Stronghold habitats for terrestrial vertebrates of focus in the Interior Columbia Basin: broad-scale trends and management implications. Vol. 2-Group-level results. General Technical Report PNW-GTR-485. Portland, Oregon. (http://www.fs.fed.us/pub/pubs/gtr485/gtr485v2b.pdf)

f. The research is being conducted under a sub-contract to Stoller Corporation. It entails capture of sage-grouse on the Idaho National Laboratory, fitting with radio-collars, and subsequent monitoring to track seasonal habitat use.

6. Response:
Results of the sage-grouse telemetry study will be used in determining additional measures necessary to reduce impacts to biological resources and will be taken into consideration in determining a course of action with regard to upgrading T-25 Powerline Road.

7. Comment:
• *Re-vegetation.* Once construction activities have been completed, DOE should revegetate all bare soils quickly with native species to aid in restoration to native vegetation. DOE should be prepared to irrigate these seedings to improve the chances of successful establishment.

7. Response:
The EA recognizes that revegetation is a key component of the control measures necessary to reduce potential negative impacts to biological resources. The EA also notes the inherent difficulties associated with revegetation in sagebrush steppe, especially with regard to the sand soils along T-25 Powerline Road, and the limited potential for success. Hafla et al. (2008) also noted the need for irrigation. Although it would not ensure successful revegetation, the DOE would use all practicable means to re-establish native vegetation on bare soils if DOE chose to upgrade the road. This will be taken into consideration in determining a course of action with regard to upgrading T-25 Powerline Road.

8. Comment:
• *Predation.* DOE should provide deterrents to raptor and raven perching and nest building on the power line, poles and any nearby structures.

8. Response:
The powerline is not part of the proposed action and is out of the scope of this EA.

9. Comment:
• *Operation schedules.* During operation, DOE should schedule transportation events (season and timing of use) in accordance with WCS data to minimize negative impacts on resident sage-grouse populations.

9. Response:
Results of the sage-grouse telemetry study will be used in determining additional measures necessary to reduce impacts to biological resources and will be taken into consideration in determining a course of action with regard to upgrading T-25 Powerline Road.

10. Comment:
• *Rehabilitation.* Upon completion of the planned shipments, DOE should take steps to abandon and rehabilitate the road.

10. Response:
With regard to the T-25 Powerline Road, the EA mentions the potential use of this road by other projects in the future. DOE has included the potential impacts of using the road in the future and would continue to use the road after the project was completed. DOE may consider rehabilitation of the road in the future if environmental conditions, such as a species being listed under the Endangered Species Act, warrant such an action.

11. Comment:
As the EA is written it is impossible for the reader to determine the impact the T-25 road upgrade would have on the greater sage-grouse or other sagebrush steppe obligate and associate wildlife species. From my familiarity with the area and wildlife within the area I suspect that sage grouse primarily use the area for nesting, early brood rearing and winter habitat. However, it would be good to have data to support or refute this assumption. For the reader with less familiarity with the area an assessment of the impacts of the T-25 road upgrade would be difficult if not impossible. Therefore I suggest including the information.

- The location, class and distance of other roads within 6 miles of the T-25 road.
- The location and class of other power-lines within 6 miles of the T-25 road.
- Data on the number of sage grouse leks within 4 miles of the road.
- The peak number of male sage grouse counted on the leks within 4 mile of the road over the past 10 years.
- The number and nesting success of any known sage grouse leks within 2 miles of the T-25 road. The Wildlife Conservation Society (WSC) radio-marked sage grouse on nearby leks last spring.
- Any data available on sage grouse early brood habitat use within 2 miles of the T-25 road. (Reference to the WCS research).
- Any data available on sage grouse late brood habitat use within 2 miles of the T-25 road. (Reference to the WCS research).
- Any data available on the sage grouse fall habitat use within 2 miles of the T-25 road. (Reference to the WCS research).
- Any data available on the sage grouse winter habitat use within 2 miles of the T-25 road. (Reference to the WCS research).

11. Response:
The EA has been modified to include the latest information on sage grouse and pygmy rabbits. Survey data for lek attendance associated with nearby leks are not available. There are a total of about 380 miles of roads within six miles of the T-25 Powerline Road. The EA has been modified to include information about road and powerline density in the project area. This information will be taken into consideration in determining a course of action with regard to upgrading T-25 Powerline Road.

12. Comment:
A review of Wisdom, M. J., et al. 2000. Stronghold habitats for terrestrial vertebrates of focus in the Interior Columbia Basin: broad-scale trends and management implications. Vol. 2-Group-level results. General Technical Report PNW-GTR-485. Portland, Oregon. (http://www.fs.fed.us/pub/pubs/gtr485/gtr485v2b.pdf) will help in the discussion of potential impacts of the T-25 road upgrade to sage grouse. Sage grouse and several other sagebrush steppe associated species are discussed in Group 33 of this publication starting on page 347 (.pdf page 54).

I applaud DOE Idaho for minimizing impacts to sagebrush obligate and associate wildlife by considering upgrading an already existing road (T-25) in habitat that has already been impacted by infrastructure development.

12. Response:
Although not cited specifically, the management implications discussed by Wisdom et al. (2000) with regard to management of sagebrush steppe formed the basis for the analyses in both Vilord et al. (2005) and Hafla et al. (2008). This is reflected in the EA with the acknowledgement that control measures may not be sufficient to protect against direct loss of habitat, habitat fragmentation, loss of a large parcel of undeveloped sagebrush steppe and loss of biodiversity. These issues will be taken into consideration in determining a course of action with regard to upgrading T-25 Powerline Road.

13. Comment:
On page 27 of the EA in the first line of the fourth paragraph the common name “sage” is used in describing low shrub vegetation on the site. Although the common name “sage” is used for the name “sagebrush” in slang vernacular it should not be used in a professional document. The common name “sage” is applied to the genus Salvia or true sages. The common name sagebrush is applied to the genus Artemisia or the sagebrushes.

13. Response:
Changed “sage” to “sagebrush”

NEPA Process

1. Comment:
The combination of risks posed by handling waste that is both ignitable and HLW is, in itself, a reason for DOE to schedule a full EIS for this project, so that environmental and safety issues can be more closely researched.

For the aforementioned reasons the Shoshone-Bannock Tribes recommend that the DOE issue a full Environmental Impact State (EIS) for the RWDP.

Ditto for all the rest of the materials proposed to be processed. You can and must provide responsibly all environmental impacts for this proposal, by performing the full environmental impact statement.

I am appalled that this document considers treating such dangerous materials as these highly radioactive and highly mobile (sodium bearing) wastes without a formal environmental impact statement under the NEPA law. I understand these materials contain all the high-level wastes resulting from the high-temperature reprocessing of the fuel from EBR-II reactor and are not just any ‘remote-handled waste.’ So I believe it is scandalously improper to issue an Environmental Assessment instead of a formal Environmental Impact Statement under NEPA.

With so little firm information on the impacts, the Department of Energy cannot reach a Finding of No Significant Impact.

The waste proposed for handling, transporting, processing, repackaging, etc., covers the whole gamut: low level, mixed, transuranic, and spent nuclear fuel. It is not at all convincing that an environmental assessment can provide adequate analysis for a project this broad. This is particularly true since the entire project duration is 10 years.

In conclusion, there is simply not enough information in the environmental assessment to allow the Department of Energy to reach a Finding of No Significant Impact. The details of processing have not been worked out. There may or may not be disposal options available.

1. Response:
DOE prepared an Environmental Assessment based on existing characterization information for the inventory to be addressed by the RWDP. Preparation of an EA requires a thorough analysis of environmental impacts in order to determine if the impacts are significant in the context of NEPA. This is the same level of analysis that would be required in an EIS. While DOE is currently refining its assessment of the historical information for each RSWF storage liner in relation to current waste management standards and regulatory requirements, conservative values were used to analyze the

potential impacts of the identified alternatives. Therefore, the potential impacts identified in the EA are bounding and will not change.

The commenter's assertion that the proposed action would be managing both highly mobile (sodium bearing) wastes and high-level waste is not correct. As described in the EA, sodium is ignitable and reactive. The EA addresses the impacts of managing both sodium-contaminated waste and bulk sodium. High-level wastes resulting from the high-temperature reprocessing of fuel from the EBR-II reactor are not includes within the scope of the RWDP.

2. Comment:
The Idaho Department of Environmental Quality (DEQ) has reviewed the above titled draft Environmental Assessment (EA) and supports the preferred alternative set forth to process remote-handled (RH) waste at the Idaho National Laboratory.

As the DEQ previously expressed, it expects the RH Transuranic waste to be removed from the state no later than December 31, 2018 in accordance with the 1995 Settlement Agreement. The draft EA appears to be geared toward meeting that requirement although no specific time lines are set out for its implementation.

The Department looks forward to working with the DOE as it implements the preferred alternative to process RH waste and remove it from Idaho.

2. Response:
DOE will implement a schedule to ensure that the milestone (December 31, 2018) in the 1995 Settlement Agreement is achieved. DOE and the project are fulfilling requirements to initiate this project to process and remove the RH waste from Idaho.

3. Comment:
I understand that a step in the disposition project is to transfer title of whatever waste will be covered from Nuclear Energy to Environmental Management. Describe that transfer process in detail, including any funding or interim storage implications at INL. What about waste remaining at RSWF and potential waste from future projects at the Materials and Fuels Complex?

3. Response:
The transfer title process is not relevant to the analysis in the Environmental Assessment. The analysis pertains to the waste described in Section 2 only.

4. Comment:
This EA is tiered from the DOE Programmatic SNF Management and INEL ER and WM Programs Final PEIS issued in 1995. I understand that supplement analyses have been prepared for the SNF & INEL EIS, but nearly 14 years later, that document may well have reached the end of its useful life.

4. Response:
As Stated in Section 1, this EA is tiered from the SNF EIS because "that document addressed DOE's programmatic need for developing appropriate facilities and technologies to manage waste and spent nuclear fuel at the INL Site including waste that requires remote handling." It also states in Section 1, a decision regarding this project, "Remote Mixed Waste Treatment Facility" was deferred. "Decisions regarding these projects will be made in the future pending further project definition, funding priorities, or appropriate review under the National Environmental Policy Act." This EA provides the appropriate review and analysis for a decision not the SNF EIS.

5. Comment:

What is the relationship between this EA and the PEIS on Greater-than-Class-C waste scheduled for release this spring?

5. Response:
The GTCC-like waste that is identified in this EA will be covered by the PEIS on Greater-than-Class-C waste (see Section 2.1).

6. Comment:
NEPA requires that DOE provide full disclosure of critical issues such this, as well as the requirement to provide foreseeable future impacts, both requirements are inadequately covered in this draft E.A.

6. Response:
The impacts have been analyzed using all available information. Preparation of an EA requires a thorough analysis of environmental impacts in order to determine if the impacts are significant.

Additional Information/Technical Edits

1. Comment:
Shouldn't the wording be "regulatory noncompliance"?

1. Response:
Correct - sentence has been corrected to read noncompliance rather than compliance.