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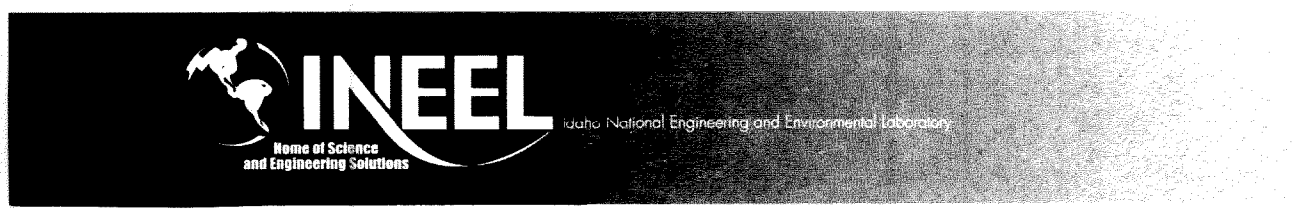
July 2001

U.S. Department of Energy
Idaho Operations Office

Waste Acceptance Criteria for ICDF Landfill (Title I)



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Prepared for the
U.S. Department of Energy
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ABSTRACT

The INEEL CERCLA Disposal Facility landfill will accept Comprehensive Environmental Response, Compensation, and Liability Act wastes generated within the Waste Area Group 3 area of contamination and other Idaho National Engineering and Environmental Laboratory Waste Area Group area of contamination boundaries. Hazardous, mixed, low-level, and Toxic Substance Control Act (polychlorinated byphenyls) wastes will be accepted for disposal at the INEEL CERCLA Disposal Facility. The purpose of this waste acceptance criteria document is to provide the basis for the quantities of radioactive and non-radioactive wastes allowable in waste designated for disposal in the INEEL CERCLA Disposal Facility landfill.

Compliance with the requirements of this INEEL CERCLA Disposal Facility landfill waste acceptance criteria will ensure protection of human health and the environment, including the Snake River Plain Aquifer. Wastes placed in the INEEL CERCLA Disposal Facility landfill must not cause groundwater in the Snake River Plain Aquifer to exceed either maximum contaminant levels or 10-4 cumulative risk levels.

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TABLES

ACRONYMS

ALARA	as low as reasonably achievable
AOC	area of contamination
ARAR	applicable or relevant and appropriate requirement
CAMU	Corrective Action Management Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFC	chlorofluorocarbons
CFR	Code of Federal Regulations
D&D	decontamination and dismantlement
DOE	U.S. Department of Energy
DOE-ID	Department of Energy Idaho Operations Office
DOT	U.S. Department of Transportation
DQO	Data Quality Objectives
EDF	engineering design file
EPA	Environmental Protection Agency
ER	environmental restoration
HI	hazard index
HOC	halogenated organic compounds
HWD	hazardous waste determination
HWMA	Hazardous Waste Management Act
ICDF	INEEL CERCLA Disposal Facility
IDAPA	Idaho Administrative Procedures Act

IDEQ	Idaho Department of Environmental Quality
IDW	investigation-derived waste
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
LDR	land disposal restriction
MCL	maximum contaminant level
mm	millimeter
O&M	operations and maintenance
NA	not applicable
NCP	National Contingency Plan
NRC	Nuclear Regulatory Commission
OU	operable unit
PCB	polychlorinated biphenyl
PPE	personal protective equipment
RA	remedial action
RCRA	Resource Conservation and Recovery Act
RCT	Radiation Control Technician
RD	remedial design
RD/RA	remedial design/remedial action
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
SRPA	Snake River Plain Aquifer
SSA	Staging and Storage Annex
SSSTF	Storage, Staging, Sizing, and Treatment Facility
TAN	Test Area North
TCLP	toxicity characteristic leaching procedure

TOC	total organic compounds
TRA	Test Reactor Area
TRU	transuranic
TSCA	Toxic Substances Control Act
UTS	universal treatment standards
WAC	waste acceptance criteria
WAG	Waste Area Group
WMP	Waste Management Plan

NOMENCLATURE

The following definitions are presented as an aid to the reader for the understanding of technical and scientific terms used within this document.

Analytical Residue and Sample Preservative Residue: Aqueous and organic solutions from sample preservatives and analytical residue generated from field preparation and laboratory analyses.

CERCLA-derived remediation and removal wastes: Wastes from Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) activities that may include, but are not limited to, soil, water, contaminated personal protective equipment (PPE), filters, and other support equipment that cannot be decontaminated.

Construction wastes: Wastes generated during the on-Site construction of environmental remedial action activities.

Contaminated equipment: Contaminated equipment becomes a waste stream if it cannot be properly decontaminated or reused.

Debris: Solid material exceeding a 60-millimeter (mm) particle size that is a manufactured object, plant or animal matter, or natural geologic material intended for disposal. However, the following materials are not considered to be debris:

- Any material for which a specific treatment standard is provided in Subpart D of 40 Code of Federal Regulations 268, such as lead acid batteries, cadmium batteries, and radioactive lead solids
- Process residuals, such as smelter slag and residues from the treatment of waste, wastewater, sludge, or air emission residues
- Intact containers of hazardous waste that retain at least 75% of their original volume.

A mixture of debris and other material that has not been treated to the standards provided by 40 Code of Federal Regulations 268.45 is subject to regulation as debris, if the mixture is composed primarily of debris, by volume, based on visual inspection.

Drill cuttings: Cuttings generated from well installation activities. Perched water and Snake River Plain Aquifer water well installation is expected to generate a substantial volume of drill cuttings.

Facility: An area within the boundaries of a Department of Energy-controlled site that is access-controlled to prevent public access; for example, the Test Reactor Area (TRA), the Idaho Nuclear Technology and Engineering Center (INTEC), and Test Area North (TAN).

Free liquids: Liquids that can readily separate from the solid portion of a waste under ambient temperature and pressure (Department of Energy Order 435.1), as demonstrated by "Environmental Protection Agency Paint Filter Liquids Test Method 9095."

Hazardous debris: Debris that contains a hazardous waste listed in Subpart D of 40 Code of Federal Regulations 261, or that exhibits a characteristic of hazardous waste identified in Subpart C of 40 Code of Federal Regulations 261.

Hazard index: The sum of more than one hazard quotient where the Environmental Protection Agency (EPA) goal is a value not to exceed 1.

Hazard Quotient: The ratio of a single substance exposure level, over a given time period, to a reference exposure level at which no adverse effects are likely to occur.

Hazardous substances: Any material designated as such pursuant to CERCLA, including all Resource Conservation and Recovery Act (RCRA) hazardous wastes, radionuclides, a variety of other chemical substances, and any material identified as a hazardous substance, such as petroleum, petroleum products, and all hazardous wastes.

Hazardous waste: Waste designated as hazardous by EPA regulations (40 Code of Federal Regulations 261.3) and regulated under RCRA.

High-level waste: Highly radioactive waste material. High-level waste results from the reprocessing of spent nuclear fuel, including the liquid waste produced directly during reprocessing. As per Department of Energy (DOE) Order 435.1, the term refers to any solid material derived from such liquid waste that contains fission products in sufficient concentrations, and to other highly radioactive material that is determined, consistent with existing law, to require permanent isolation. (Adapted from: Nuclear Waste Policy Act of 1982, as amended.)

Hydraulic spills: Unintentional releases of hydraulic fluid. Spills that occur when hydraulic fluid leaks from equipment seals or through ruptured hoses.

Investigation-derived waste: Materials that are generated from CERCLA investigations, such as drill cuttings, purge water, development water, overburden, interstitial and under burden soils, and wastes (debris, sludge, etc.).

Infectious waste: Waste containing living organisms that could endanger human health or the health of domestic animals or wildlife by extending the range of biological pests, viruses, pathogenic microorganisms, or other agents capable of infesting, infecting, or extensively and permanently altering the normal populations of organisms.

Low-level radioactive waste: Waste that cannot be defined as high-level radioactive waste, spent nuclear fuel, transuranic (TRU) waste, by-product material [as defined in Section 11e. (2) of the Atomic Energy Act of 1954, as amended], or naturally occurring radioactive material (Department of Energy Order 435.1).

Miscellaneous waste: Non-recyclable, unwanted material, such as trash, labels, rags, and other debris.

Mixed waste: Waste containing both radioactive components as defined by the Atomic Energy Act of 1954 (as amended), and hazardous components as defined by 40 Code of Federal Regulations 262.

Personal protective equipment: Items worn or used during waste-handling activities such as coveralls, shoe covers, boots, gloves, glove liners, hoods, and duct tape. Coveralls and hoods are generally made of paper or Tyvek. Gloves are generally latex or nitrile, and glove liners are made of disposable cloth material. Shoe covers and boots are generally rubber.

Purge/development water: Water generated from well development or during sampling that is removed from a well before samples are collected.

Radioactive waste: Solid, liquid, or gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954 (as amended) which is of negligible economic value considering costs of recovery.

Sample containers. Vessels composed of steel, aluminum, Teflon, brass, glass, or plastic used to contain samples of water, soil, or other media. Once used, these containers become a waste stream if they cannot be decontaminated for reuse.

Secondary waste: A generic category of wastes that are generated from support activities (including operations and maintenance [O&M] activities) related to retrieving, processing, and packaging the investigation-derived materials. Examples of secondary wastes include waste associated with routine decontamination activities (excluding facility closure), PPE, administrative area and support services wastes, used equipment and filters, and other similar wastes generated during O&M activities.

Solidification: A technique that limits the solubility and mobility of hazardous waste constituents through physical means. This process changes the physical state from liquid or semi-solid to a solid.

Soil waste: Soils excavated as part of a project that may be contaminated as a result of spill and pipeline leaks or radioactive liquids from plant liquid transfer operations.

Special case waste: Waste with TRU constituents exceeding 10nCi/g, polychlorinated biphenyl (PCB) waste, and other waste not routinely expected to be processed through the Storage, Staging, Sizing, and Treatment Facility (SSSTF). Special case waste may include waste that will be classified as TRU waste following analysis.

Spent nuclear fuel: Fuel that has been withdrawn from a nuclear reactor following irradiation and that has not yet been reprocessed to remove its constituent elements.

Stabilization: A technique that limits the solubility and mobility of hazardous waste constituents by causing the constituents to bond or chemically react with the stabilizing material.

Structural stability: A waste form that will generally maintain its physical dimensions and its form under the expected disposal conditions, such as weight of overburden and compaction equipment, the presence of moisture and microbial activity, and internal factors such as radiation effects and chemical changes. The waste form itself can provide structural stability by processing the waste to a stable form or by placing the waste in a disposal container or structure that provides stability after disposal.

Toxic Substances Control Act (TSCA) waste: Waste managed strictly under TSCA regulations. Presently, only PCBs and asbestos are regulated under TSCA as waste.

Transuranic waste: Per DOE Order 435.1, radioactive waste containing more than 100 nanocuries (3,700 becquerels) 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 EPA, does not need the degree of isolation required by the 40 Code of Federal Regulations Part 191 disposal regulations; or (3) waste that the Nuclear Regulatory Commission (NRC) has approved for disposal on a case-by-case basis in accordance with 10 Code of Federal Regulations Part 61. (Source: Waste Isolation Pilot Plant Land Withdrawal Act of 1992, as amended.)

Unused and unaltered sample material: Material that may include excess soil cores from the interbeds, underlying basalt, and groundwater.

Waste Acceptance Criteria for the ICDF Landfill (Title I)

1. INTRODUCTION

The U.S. Department of Energy Idaho Operations Office (DOE-ID) authorized a remedial design/remedial action (RD/RA) for the Idaho Nuclear Technology and Engineering Center (INTEC) in accordance with the Waste Area Group (WAG) 3, Operable Unit (OU) 3-13 Record of Decision (ROD) (DOE-ID 1999). The ROD requires the removal and on-Site disposal of some of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remediation wastes generated within the boundaries of the Idaho National Engineering and Environmental Laboratory (INEEL).

The ROD requirements necessitate the construction of the INEEL CERCLA Disposal Facility (ICDF), which will be the disposal facility for the ROD-identified waste streams. The ICDF will be an on-Site, engineered facility, located south of INTEC and adjacent to the existing percolation ponds, that meets the substantive requirements of Resource Conservation and Recovery Act (RCRA) Subtitle C, Idaho Hazardous Waste Management Act (HWMA), DOE Order 435.1 (DOE 1999a), and Toxic Substances Control Act (TSCA) polychlorinated biphenyl (PCB) landfill design and construction requirements. Designed and authorized to accept not only WAG 3 wastes, but also wastes from other INEEL CERCLA actions, the ICDF Complex will include the necessary subsystems and support facilities to provide a complete waste disposal system.

The major components of the ICDF include:

- The disposal cells (landfill)
- An evaporation pond
- The Staging, Storage, Sizing, and Treatment Facility (SSSTF).

The ICDF Complex, including a buffer zone, will cover approximately 40 acres, with a disposal capacity of approximately 510,000 yd^3. The evaporation pond, designated as equivalent to a RCRA Corrective Action Management Unit (CAMU) in the OU 3-13 ROD, will be the disposal site for ICDF leachate, and other aqueous wastes generated as a result of operating the ICDF Complex. It will also accept decontamination water and water from CERCLA-generated well purging, sampling, and well development activities. The ICDF leachate will be pumped directly to the evaporation pond and the pump system will track the volume of waste disposed to the pond.

The SSSTF will be designed to provide the centralized receiving, inspection, treatment, and segregation areas necessary to stage and store incoming waste from the other INEEL CERCLA remediation sites prior to disposal to the ICDF landfill or shipment off-Site. All SSSTF activities shall take place within the WAG 3 area of contamination (AOC) to allow flexibility in managing the consolidation and remediation of wastes without triggering land disposal restrictions (LDRs) and other RCRA requirements, in accordance with the OU 3-13 ROD, although LDRs will apply to waste generated outside the WAG 3 AOC or to those wastes that have triggered placement. Figure 1-1 illustrates the WAG 3 AOC.

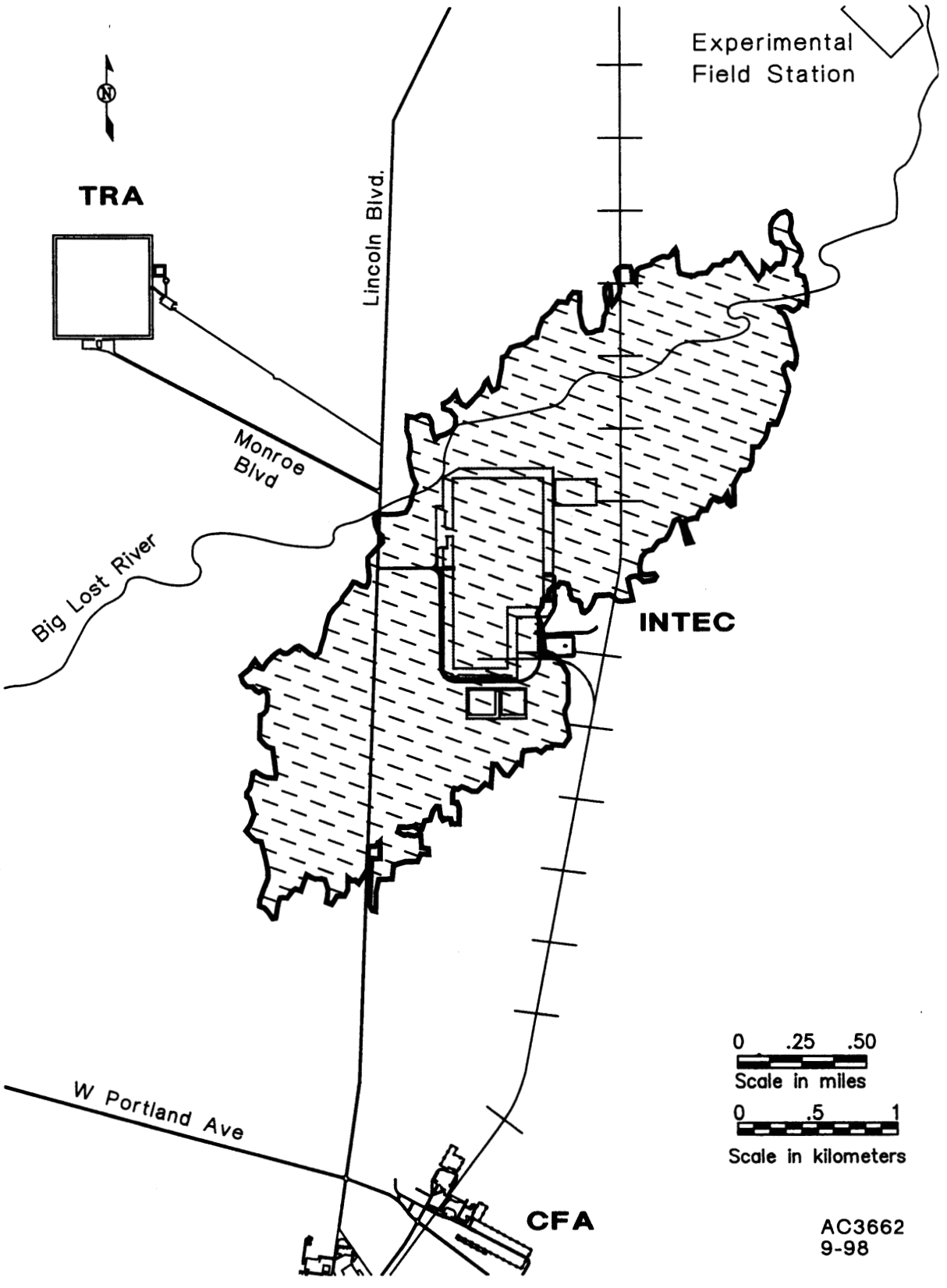


Figure 1-1. WAG 3 area of concern.

A short-term storage area, the Staging and Storage Area (SSA), is already located within the INTEC fenced area to serve as a temporary storage area for INEEL CERCLA waste designated for:

- Direct disposal to the ICDF landfill
- Packaging in preparation for off-site disposal
- Other INEEL on-site disposal.

Wastes from WAG 3 and other CERCLA remediation sites will be stored at the SSA during the design and construction phases of the ICDF Complex, including the construction of the SSSTF. When the SSSTF becomes operational, the SSA will administratively become part of the SSSTF, which in turn, will be a fundamental element of the ICDF Complex.

The ICDF landfill will accept only low-level, mixed low-level, hazardous, and TSCA remediation wastes <500 parts per million (ppm) PCBs for disposal. Current projections of Site-wide CERCLA waste volumes total about 510,000 yd^3. Most of the waste will be contaminated soil, but debris and CERCLA investigation-derived waste (IDW) are also included in the waste inventory.

This document details the criteria that must be satisfied prior to the ICDF's acceptance of waste for disposal. Compliance with the ICDF landfill waste acceptance criteria (WAC) will ensure protection of human health and the environment, including the Snake River Plain Aquifer (SRPA). Wastes placed in the ICDF landfill must not cause groundwater in the SRPA to exceed Idaho maximum contaminant levels (MCLs), 10^{-4} cumulative risk levels, or a hazard index (HI) of 1.

1.1 Purpose and Objectives

The purpose of this WAC document is to provide the basis for the quantities of radioactive and non-radioactive constituents that may be accepted for disposal at the ICDF landfill. The objectives of the ICDF WAC are to ensure:

- Waste placed within the ICDF will not exceed the allowable limits for the protection of the SRPA per the OU 3-13 ROD requirements
- The commitments in the OU 3-13 ROD are met and maintained
- The waste received at the ICDF contains only the radionuclides and hazardous constituents that the facility can safely manage
- The concentrations and/or total activities of the waste received at the ICDF are compatible with the ICDF design and operations
- The low-level waste received at the ICDF is in a form or container that will maintain its integrity and retain acceptable configuration under the conditions expected to be encountered during ICDF operations and closure
- Waste received at the ICDF does not contain materials that will compromise the safety or integrity of the facility under the expected operating conditions. For example, waste with greater than 10% voids could compromise the cover integrity due to subsidence, reactive wastes could compromise worker safety, and liner incompatible wastes could compromise liner integrity.

1.2 Scope

The ICDF Complex, including the ICDF landfill cells, will be designed to DOE Order 435.1, RCRA subtitle C minimum technology requirements (40 Code of Federal Regulations [CRF] 264 Subpart K requirements) and TSCA PCB design and construction specifications. The ICDF will be designed and managed to meet the National Contingency Plan (NCP) requirement of maximum 15 mREM/yr exposure to the public. Exposure to members of the public will be evaluated as visitors to the ICDF Complex. The ICDF landfill will be authorized to accept wastes generated within the INEEL from CERCLA removal/remedial and investigative activities at the INEEL WAGs.

1.3 Roadmap to ICDF Landfill WAC

The following are primary elements of the ICDF landfill acceptance requirements:

- Responsibilities (Section 1.5)
- Criteria basis (Section 4.1)
- Acceptance criteria (Section 5)
- Waste content or concentration accepted at the SSSTF (Section 5)
- Waste form and container requirements (Section 5)
- Exceptions to WAC requirements (case-by-case acceptance) (Sections 2.4.4 and 3.6)
- Prohibitions (Section 5.1)
- Non-compliant waste (Section 3.8 and 5.1).

1.4 Relationship to Other Documents

This ICDF WAC is based on and integrated with several related documents, as discussed below.

1.4.1 OU 3-13 Record of Decision

The OU 3-13 ROD (DOE-ID 1999b) is the regulatory authorization for the ICDF Complex. This document includes the regulatory basis for the ICDF landfill, and the applicable or relevant and appropriate requirements (ARARs) that the ICDF Complex must meet. The OU 3-13 ROD also describes the AOC for WAG 3. Because the ICDF Complex will receive waste from both inside and outside of the AOC, this WAC has different requirements for mixed waste from inside and outside of the AOC. These AOC issues are addressed in more detail in the WAC Basis (Section 2.1).

1.4.2 Related ICDF Complex WACs

When the ICDF Complex becomes operational, three integrated WACs will actively govern the requirements of the acceptance and disposal process. These WACs are briefly described below:

1. **ICDF Landfill WAC**—This WAC specifies the requirements for the disposal of waste in the ICDF landfill.

2. **SSSTF WAC**—The SSSTF WAC will encompass waste entering the SSSTF for storage or off-Site shipment. Wastes meeting the SSSTF WAC must also demonstrate that they meet the ICDF landfill WAC in order to be accepted for disposal in the ICDF landfill.

3. **Evaporation Pond WAC**—This WAC must be met by all ICDF landfill leachate transferred to the evaporation pond, all monitoring well purge and development water proposed for disposal in the evaporation pond, and other aqueous wastes generated as a result of operating the ICDF Complex.

Integration between the various WACs will be achieved, in part, through the use of the same waste profile by all facilities. The waste profile, an example of which is provided in Appendix A, will help provide consistent documentation of the waste during shipment or transfer.

1.5 Responsibilities

The INEEL Environmental Restoration organizations operating and using the ICDF are responsible for performing activities in accordance with this document. A system of checks and balances is in place to ensure the appropriate level of coordination between ICDF and the various users. A series of interface points are designed to communicate waste receipt schedules, waste quantity and form, characterization information, waste certification, treatment requirements, packaging, transportation, documentation, receipt, and disposal. A general description of the system is presented below. The remainder of this section identifies specific responsibilities of the ICDF and ICDF management and operations team and ICDF users with respect to waste acceptance and disposal.

1.5.1 ICDF Landfill Management and Operations Team

The ICDF management and operations team includes ICDF personnel and subcontractors assigned to operate the facility and transport waste.

1.5.2 ICDF Complex Personnel

The ICDF personnel assigned to the management and operations team are responsible for:

- Providing Waste Profile Numbers
- Establishing and maintaining the ICDF WAC documentation
- Reviewing and approving or rejecting requests for disposal of new waste forms or chemicals based on health and safety, ICDF liner compatibility, physical form of the waste, and environmental regulations as set forth in this document and the WAG 3 OU 3-13 ROD
- Integrating waste scheduling and transportation with ICDF users
- Reviewing and periodically auditing waste certification processes and associated documentation prepared and implemented by ICDF users
- Maintaining a proactive quality assurance oversight program for timely identification of deficiencies and implementation of appropriate corrective actions
- Inputting waste locations into ICDF cell maps and documenting the location of waste in each cell

- Reviewing any special case waste that would require an exemption to the ICDF WAC.

1.5.3 ICDF Landfill Users

Users of the ICDF are responsible for:

- Considering ICDF WAC requirements during the RD/RA process
- Specifying and obtaining approval from the ICDF Complex management prior to shipping waste to the ICDF Complex, whether a waste stream is intended for direct disposal to the ICDF landfill, the evaporation pond, storage, or is being shipped to the SSSTF for treatment prior to disposal or shipment off-site
- Obtaining and/or confirming regulatory authority for disposal of waste at the ICDF during the ROD or RD phase
- Participating in routine planning discussions and submitting long-term and operational project schedules
- Developing, documenting, and implementing an appropriate sampling and analysis program approved by the ICDF Complex management when required
- Characterizing waste to ensure proper documentation of types and quantities of radionuclides, hazardous constituents, and physical and chemical characteristics
- Evaluating treatment options for waste disposal, when applicable
- Preparing the waste profile, designating the waste, and obtaining ICDF acceptance for each waste source or group of waste sources.

2. WASTE PROFILE PROCESS

2.1 General Requirements

The generator must fill out a waste profile for waste to be generated and then obtain ICDF Complex operations approval before shipping the waste to the ICDF Complex for disposal. Table 2-1 summarizes the types of waste that are accepted at the ICDF landfill.

Waste proposed for disposal at the ICDF will undergo analyses for radionuclides, metals, cations, anions, and organics, and other parameters as needed to complete the Waste Profile. In some cases, the hazardous constituent results may exceed the "toxicity characteristic leaching procedure (TCLP) 20× rule." This means that if the total metals content of a waste equals more than the TCLP limits multiplied by 20, the waste may be a characteristic hazardous waste. If waste proposed for ICDF disposal exceeds the "TCLP 20× rule," TCLP analysis may be performed on each waste unless process knowledge confirms that these activities are not needed or necessary. If process knowledge is used as confirmation, appropriate documentation shall be provided with the waste profile.

Both direct and indirect methods are used to characterize waste. Selection of the method depends on the parameters being measured, hazards associated with acquiring the information, and the amount and quality of data needed. When capable of yielding sufficient information, indirect methods are preferred for obtaining the characterization data, as is consistent with as low as reasonably achievable (ALARA) requirements. Acceptable knowledge can be effective when waste behavior is well known and highly controlled for a predictable product.

2.2 General Class of Waste

The ICDF is designed to manage low-level and mixed waste. This generally excludes acceptance of waste classified as high-level waste, spent nuclear fuel, and/or byproduct material.

Table 2-1. Summary of acceptable types of wastes for the ICDF landfill.

Waste Type Accepted at the ICDF	Concentration/Content Accepted
Nonhazardous/ Nonradioactive waste (i.e., industrial waste)	Waste must be certified to contain no hazardous or radioactive component. Additionally, the generator must justify to the ICDF manager or designee why the waste is not proposed for disposal at the Central Facilities Area (CFA) Bulk Waste landfill.
Hazardous Waste	Wastes from outside the AOC and waste from inside the AOC that have triggered placement must meet the land disposal restrictions (LDR shown in Table 5-4) and universal treatment standards (UTS) requirements listed in Appendix C. Wastes from inside the AOC that have not triggered placement must meet the requirements for hazardous waste constituents given in Table 5-2 (organics) and Table 5-3 (inorganics).
Radioactive Waste	Both a radiation count and speciation are required for radioactive waste. Radionuclide content of waste against the various limits listed is provided in Appendix B.

Mixed Waste	Mixed waste must meet both the hazardous and radioactive WAC. Mixed wastes from outside the AOC and waste from inside the AOC that have triggered placement must meet the land disposal restrictions (LDR shown in Table 5-4) and UTS requirements listed in Appendix C. Mixed wastes from inside the AOC that have not triggered placement must meet the requirements for hazardous waste constituents given in Table 5-2 (organics) and Table 5-3 (inorganics).
Drill Cuttings	Drill cuttings will be accepted at the ICDF if they meet the WAC.
CERCLA Investigation –Derived Waste (IDW)	CERCLA IDW can be hazardous, radioactive, mixed, or TSCA waste that meets the WAC.
TSCA Waste (including mixed TSCA waste)	TSCA waste will be accepted into the ICDF if it meets the WAC.

Each of the wastes listed in Table 2-1 is further described in a subsequent section, and guidelines for the waste profile appear in Section 3-4. An example of the waste profile is provided in Appendix A.

2.3 Composition and Waste Containers

For all waste, a detailed record must be kept of the contents, volume, and weight, as well as any added void fillers, sorbents, stabilization agents, or solidification agents.

For containerized waste, the container type, weight, internal and external volume, any shielding provided, and the date packaged must be recorded.

2.4 Physical and Chemical Characterization

The waste generator must determine the physical and chemical characteristics of the waste with sufficient accuracy and detail to properly designate and manage the waste in accordance with the unit-specific acceptance criteria and all applicable regulations (i.e., acceptable knowledge). The following sections describe the physical/chemical characterization requirements for waste acceptance (40 CFR 264.13, 40 CFR 761).

2.4.1 Type of Acceptable Knowledge

Types of information that can be used for physical/chemical characterization include data from analysis of the waste and knowledge of the materials and/or processes used to generate the waste. Acceptable knowledge requirements can be met using one or more of the following:

- Mass balance from a controlled process that has a specified output for a specified input including time of generation
- MSDS on unused chemical products
- Analytical data on the waste or a waste from a similar process
- Test data from a similar process including sufficient information to document that the waste is essentially the same as that from the similar process.

In addition, acceptable knowledge requirements can be met through the use of a combination of analytical data or screening results and one or more of the following:

- Documented interview information
- Logbooks
- Procurement records
- Qualified analytical data
- Radiation work packages
- Procedures and/or methods
- Process flow charts
- Inventory sheets
- Vendor information
- Mass balance from an uncontrolled process (e.g., spill cleanup)
- Mass balance from a process with variable inputs and outputs (e.g., washing/cleaning methods).

If the information is sufficient to quantify constituents and characteristics, as required by the regulations and unit-specific acceptance criteria, the information is considered acceptable knowledge. These types of information will require a separate concurrence by the ICDF Complex management prior to the waste being accepted at the Complex.

2.4.2 General Knowledge Requirements

When a waste designation is based solely on process knowledge, the generator must ensure that the chemical, physical, and radiological properties of the waste are adequately determined. The designation must be accomplished with sufficient accuracy to ensure that subsequent treatment, storage, or disposal of the waste will ensure protection of human health and the environment. The logic used to make the designation must be documented. The technical basis, including documented historical information, procedures, practices, and information gained from interviews, shall be documented.

The minimum level of acceptable knowledge must include: 1) designation data where the constituents causing a listed waste code to be assigned are quantified; and 2) data that address acceptance criteria necessary for proper management of the waste.

Analytical data and/or knowledge of the waste must be sufficient to determine whether the waste is regulated under 40 CFR 261 or 760, and to assign correct hazardous waste codes (when applicable). When the available information does not qualify as acceptable knowledge or is not sufficient to characterize a waste for management, the sampling and testing methods outlined in the ICDF Waste Management Plan must be used to determine whether the waste is acceptable for ICDF Complex disposal.

In cases where constituents that could cause a waste to be listed are present in a process, but are not expected to be in the waste in concentrations causing the waste to be above LDRs (e.g., those wastes generated outside the WAG 3 AOC, or which have triggered placement), sampling and analysis must be performed to demonstrate that the constituents are below regulated limits. This requirement can be met through previous investigations, such as Remedial Investigations/Feasibility Studies (RI/FS) or other CERCLA investigations. This sampling and analysis is required only for initial characterization of the waste stream.

Listed waste may be designated based on process knowledge. Other waste stream designations may be based on process knowledge and/or analytical data. The generating CERCLA project will conduct a reasonable review to determine whether a listed waste source is present at the remediation waste site. The listed waste review generally will rely on readily available documents gathered as a part of the standard CERCLA site evaluation or RI/FS. For CERCLA OUs from which listed waste sources are reasonably expected, standard operator interviews should be augmented and documented as necessary to ask questions specifically aimed at identification of potential sources. Operator interviews will not be used as the sole basis for an affirmative listed waste determination in the absence of confirmatory documentation or physical evidence.

Incompatible wastes (40 CFR 264.10) which require special handling or segregation must be identified in the waste profile, including the Appendix V group number and the precautions must be listed. Once incompatible wastes are received at the ICDF Complex they will be staged/stored in the SSSTF with like materials based on Appendix V groups.

2.4.3 Land Disposal Restriction Knowledge

For hazardous waste (as defined in 40 CFR 261) that has been generated outside the WAG 3 AOC (or has triggered placement), waste characterization must be sufficient to establish whether the waste is a restricted waste under the LDR provisions of 40 CFR 268 or the alternative LDR treatment standards for contaminated soil at 40 CFR 268.49. If either of those LDR provisions apply, then the applicable treatment standard(s) for that waste must be determined. Data from a CERCLA RI/FS can be utilized for this demonstration, if the appropriate parameters were analyzed, and if the data are representative of wastes resulting from implementation of the remedy. Additional testing of a representative sample of the waste stream may be required to clarify that the waste meets a concentration-based treatment standard of 40 CFR 268 or 40 CFR 268.49.

2.4.4 Exceptions to Physical and Chemical Characterization Requirements

The following exceptions can be made to the physical/chemical characterization requirements stated previously:

- Hazardous debris that is managed in accordance with the alternative treatment standards for hazardous debris (40 CFR 268.45) does not require sampling and analysis for adequate physical/chemical characterization.

- Waste that cannot be characterized in accordance with the requirements stated previously because of factors such as unique chemical or radiological hazards of the waste can be characterized by an alternative management path negotiated with the ICDF Complex management.

2.5 Radiological Characterization

The major radionuclides in the waste and the concentration of each major radionuclide must be established with sufficient sensitivity and accuracy to properly classify and manage the waste in accordance with the radiological limits.

2.5.1 Identification of Major Radionuclides

For the purposes of the radiological criteria in this document, major radionuclides are defined as those radionuclides that meet any of the following conditions.

- Any transuranic (TRU) radionuclide present in the waste in concentration exceeding 1 nanocurie per gram
- Any radionuclide that accounts for more than 1% of the total radiological activity of the waste
- Any radionuclide present in concentration exceeding 1% of its respective Category 1 limit (Appendix B, Table B-2)
- Any mobile radionuclide present in concentration that exceeds its reporting limit (Appendix B, Table B-2)
- For waste that cannot be radiologically released (waste with very low levels of radiological contamination that are still above the INEEL Site Release Criteria for non-radiological waste) an estimate of radiological constituents will be included in the waste profile for tracking purposes.

Calculation methods for determining these limits are described in Appendix B.

2.5.2 Acceptable Knowledge and Methods for Establishing Radionuclide Inventories

The radionuclide inventory of a waste must be established through the use of a method or combination of methods capable of identifying and quantifying the major radionuclides present. The methods chosen must provide adequate sensitivity and accuracy to ensure that the waste meets the criteria.

A graded approach should be applied when planning radiological characterization. Using the graded approach, more frequent and detailed analysis and a higher level of statistical confidence are applied when the concentration of radionuclides is performed when a waste approaches one or more of the limits of the criteria. Conversely, waste that measures far below applicable limits of the criteria would not require as extensive or frequent analysis.

Both direct and indirect methods can be used for characterization. Indirect methods (i.e., methods other than direct measurement of a given radionuclide) are acceptable as outlined in the Federal Register, November 20, 1997, Clarification of RCRA Hazardous Waste Testing Requirements for Low-Level Radioactive Mixed Waste-Final Guidance, "*This guidance encourages mixed waste handlers to use waste knowledge, such as process knowledge, where possible, in making RCRA hazardous waste determinations involving mixed waste.*" The same guidance states, "*Because mixed waste testing may pose the possibility of increased radiation exposure, this guidance also describes methods by which individuals who analyze*

mixed waste samples may reduce their occupational radiation exposure and satisfy the intent of RCRA testing requirements."

The following characterization methods can be used individually or in combination to establish the radionuclide inventory of the waste.

Process knowledge includes documented knowledge of the radioactive materials used and the processes that contributed to the radiological content of the waste, along with historical analysis of waste and radiological contamination from the process. Process knowledge can be used to establish the suspected major radionuclides in a waste stream. In addition, process knowledge can be used to eliminate from further consideration those radionuclides not present in sufficient concentration to be major radionuclides, as defined in Appendix B, as long as the basis of this determination is documented. Process knowledge alone generally may not be sufficient to quantify the radionuclide inventory of a waste.

Direct measurement field and laboratory analysis methods, such as radiochemical analysis, and surveys with field instruments, must be selected as appropriate to detect and quantify the major radionuclides with adequate sensitivity and accuracy for waste classification. Analysis methods that measure gross activity (i.e., not radionuclide-specific) may be used in conjunction with other methods to determine the relative concentration (scaling factors) of each suspected radionuclide, and may be corroborated periodically with radionuclide-specific analysis.

Computer modeling, applied appropriately, may be used in conjunction with other methods for radiological characterization. The modeling must be performed by an individual who is knowledgeable and experienced in the use and limitations of the model. The assumptions and measurements used as inputs to computer modeling must be documented. The computer software must be controlled in a manner that meets conventional quality assurance requirements. Computer models must be corroborated periodically with direct measurement methods.

Scaling factors can be used to relate the concentration of a readily measured radionuclide to radionuclides that are more difficult to measure. Scaling factors must be developed from one of the previous methods, and must be corroborated periodically with radionuclide-specific analysis. Other methods of radiological characterization could be used, but must be clearly documented and approved by the ICDF Complex management. Documentation of the method must include a detailed description of the method, the radionuclides identifiable by the method, and a discussion of precision, accuracy, quality assurance, and quality control methods.

2.5.3 Additional Detail on Mobile Radionuclide Characterization

For low-level waste and low-level mixed waste, mobile radionuclide reporting is necessary for compliance with the ICDF Complex performance assessments. Because of the low reporting limits and difficulty of analysis of certain mobile radionuclides, this section provides additional detail concerning acceptable knowledge and characterization.

The concentration of each mobile radionuclide must be established with respect to the Appendix B, Table B-2, reporting limit using process knowledge and/or analysis. If process knowledge alone is used to determine that a mobile radionuclide is not present in a waste stream at the reporting limit, the basis for this determination must be clearly documented. If available analysis techniques cannot detect a mobile radionuclide at its reporting limit, the concentration could be estimated using a combination of process knowledge, scaling factors, and analytical detection limits. Mobile radionuclide reporting is intended to measure only the quantity of isotopes that exceeds INEEL Site natural background concentrations. For

waste forms that contain a mobile radionuclide (uranium) that originates from natural background on the INEEL site, the background concentration of that radionuclide can be subtracted from the total concentration.

3. WASTE ACCEPTANCE PROCESS

Waste entering the ICDF Complex shall be controlled on the basis of source, physical form, and containment concentration levels. A uniform and consistent waste acceptance process shall be implemented to include planning, waste certification, waste shipment, and waste receipt and disposal. The sequenced process for acceptance and disposal of waste to the ICDF landfill is outlined in Figure 3-1 from the planning through the disposal. The ICDF Complex management will be responsible for ensuring the acceptability of waste being disposed in the ICDF.

- **Box 1:** the project that will be generating the waste notifies the ICDF Complex of the intent to ship non-aqueous waste to the ICDF Complex for disposal or for treatment and disposal.

- **Box 2:** The process of planning, sampling, and analyzing the waste, and completing the waste profile sheets will be reviewed and/or audited by the ICDF Complex personnel.

- **Box 3:** The completed waste profile is submitted to the ICDF Complex.

- **Box 4:** ICDF Complex Management reviews the waste profile, accepts or rejects the waste, and determines the destination of the waste.

- **Boxes 5 and 6:** If the waste profile is rejected, the profile may be resubmitted by the generating WAG manager after suitable corrections.

- **Box 7:** If the waste profile is approved, the waste will be assigned a shipping date and a destination in the ICDF or SSSTF. Nonaqueous waste that is suitable for direct disposal will be sent to the ICDF landfill. If the waste requires treatment prior to disposal, it will be sent to the SSSTF. For nonaqueous wastes that will be treated in the SSSTF, the final disposal destination will be the ICDF landfill.

- **Box 8:** Waste profile verification will be done at the remediation site (box 8). All of the waste packaged for shipment to the ICDF Complex will be checked against the waste profile, visually inspected, and verified during the remediation excavation and/or loading process to ensure that the waste matches the submitted waste profile. Verification consists of nonintrusive analysis such as a surface radiological survey. If the waste profile verification activities indicate that the waste does not match the profile, the waste will be set aside for resolution of the identified problem. If the issue is not resolved, the waste will not be shipped to the ICDF Complex for disposal.

- **Box 9:** Upon receipt at the SSSTF, the paperwork and electronic documentation accompanying each shipment of waste will be reviewed. The waste shipment will be double-checked against accompanying documentation for items such as number of containers, container integrity, bar codes, and waste codes. The final check that waste is acceptable for disposal is the responsibility of the ICDF Complex Management.

- **Box 10:** If the documentation is incomplete or incorrect, issues with the documentation will be resolved, or the waste will be set aside pending resolution.

- **Box 11:** If the documentation is correct, the waste will enter the SSSTF gate.

- **Box 12:** The waste will be routed for either treatment or disposal.

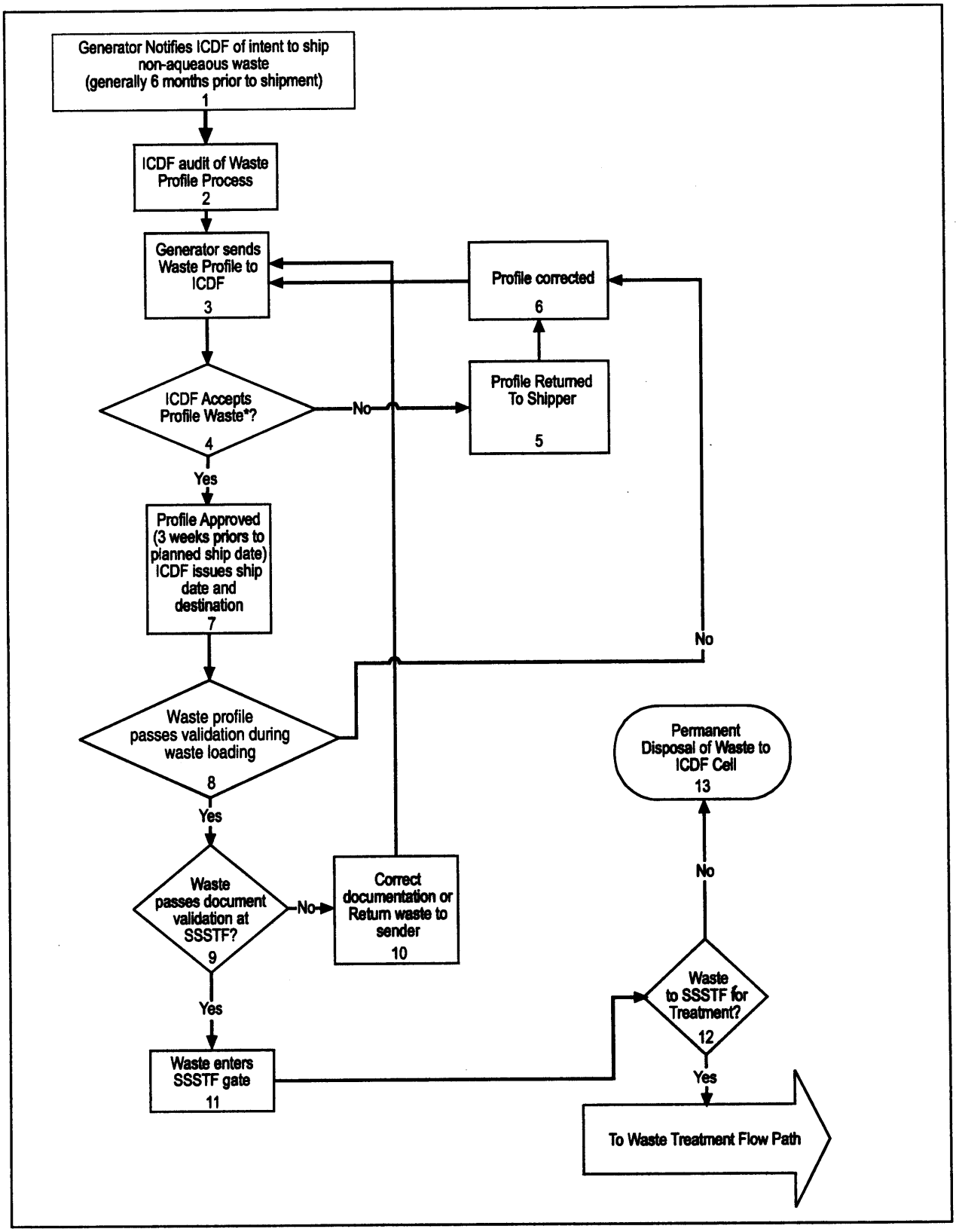


Figure 3-1. Nonaqueous waste flow path.

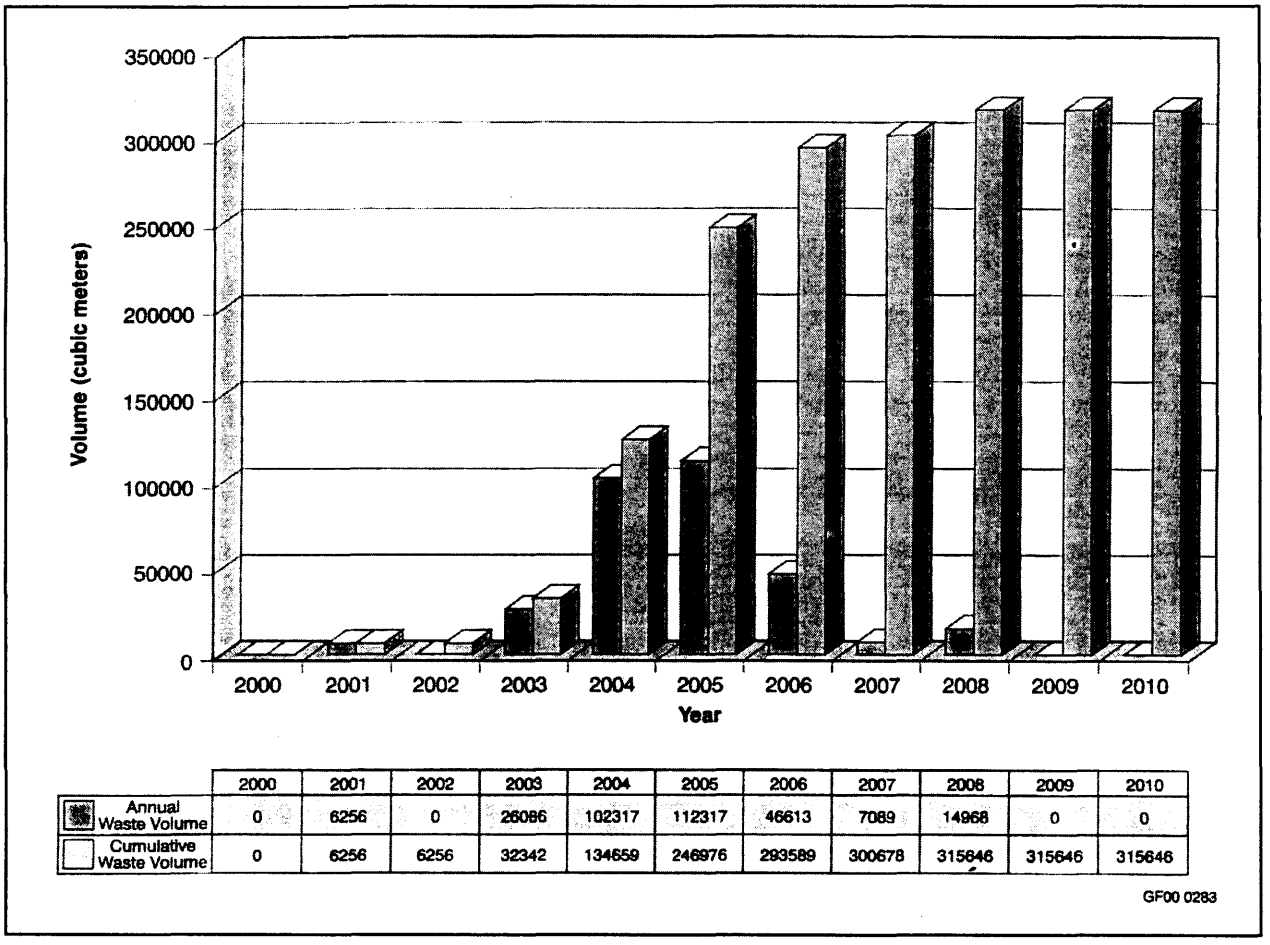
- **Box 13:** Waste suitable for direct disposal will be sent to the ICDF landfill.

3.1 Planning

All ICDF users shall provide long-term and operational project schedules to the ICDF management and operations team for use as a planning tool. Failure to provide the ICDF management and operations team with project schedules or to participate in routine planning discussions may result in delays to the acceptance process.

3.1.1 Waste Streams and Volumes

Projected waste streams and volumes are shown in Figure 3-2.



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Annual Waste Volume	0	6256	0	26086	102317	112317	46613	7089	14968	0	0
Cumulative Waste Volume	0	6256	6256	32342	134659	246976	293589	300678	315646	315646	315646

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Figure 3-2. Projection of ICDF Complex waste receiving schedule.

3.1.2 Long-Term Schedule

Before starting a project, ICDF users shall submit an overall project schedule to the ICDF management and operations team to include estimates of the following information at a minimum:

- Start date

- Completion date
- Waste volume
- Primary waste forms (e.g., soil, concrete, steel, wood, and asbestos)
- Potential radioactive and hazardous constituents
- Applicable listed waste codes
- Special handling requirements (including anticipated need for treatment at the SSSTF, if applicable).

Table 3-1 lists the major planning steps and dates for completion that a CERCLA project manager must meet in coordinating with the ICDF Complex manager for waste disposal.

Table 3-1. Schedule for CERCLA project and ICDF Complex interaction.

Information	Date Information Due to ICDF Complex Management
CERCLA Project Name	6 months prior to anticipated ship date
Anticipated Waste Type	6 months prior to anticipated ship date
Projected Schedule for Waste Generation	6 months prior to anticipated ship date
Waste Profile Approval	3 months prior to anticipated ship date
Preliminary Acceptance and Authorization to ship	6 weeks prior to anticipated ship date
Shipping Schedule (number of trucks/containers per day) and days of shipment	1 week prior to first ship date
Receipt of Waste Volume	Actual ship date

It will be the responsibility of the WAG manager to notify the ICDF Complex Operations Manager of any delay or deviation from the waste profile that may occur after receipt of the shipping date. This may require that the profile be amended and approval of a new shipping date.

3.1.3 Operational Schedule

Operational project schedules shall be provided to the ICDF management and operations team, and users shall participate in routine planning discussions. Operational schedules shall include anticipated waste to be shipped for each active waste profile based on a rolling 6-week projection. Operational schedules shall be provided to the ICDF management and operations team as field activities are initiated and throughout the duration of the project.

3.2 Waste Tracking System

This system is currently under development and revision for use at the ICDF Complex.

3.3 Data Quality Objectives

Either the data quality objectives process or a comparable process will be used to identify characterization parameters and acceptable uncertainty in characterization data. The intent is not to re-characterize using data quality objectives (DQO) identified waste streams, but to ensure that new waste streams are identified and generated, and/or that existing streams are significantly modified. DQO can be used as supporting documentation from the waste generators when they are providing information to meet the WAC.

3.4 Waste Profile

Waste profile information will be required for each waste entering the ICDF Complex. The generator of the waste will provide a completed waste profile a minimum of 6 weeks prior to anticipated shipping. (A sample waste profile has been provided in Appendix A.)

The waste generator must include the following information on the waste profile:

- Documented Quality Assurance Program
- Procedures used for sampling, packaging, transporting, laboratory analysis, and data control
- Documentation of procedure/process controls.

In addition, the generator will be required to provide the following information to the ICDF manager or designee:

- Documentation of data change control process
- Training
- Analytical results
- Radioactivity (concentration and speciation)
- Process knowledge
- Physical description
- Hazardous waste determination
- LDR determination (if applicable)
- Database-generated number
- Volume/quantity
- Container and packaging type
- Container identification and labeling.

Other information/analysis results that may be required include, but are not limited to, the following:

- Paint filter
- Reactivity
- pH/corrosivity
- Special analytical process required for a specific waste type
- RCRA LDR constituents (10x LDR)
- Debris treatment process if performed at the generating WAG.

Testing will include the radiological screening results, and the results of these tests will be filed with the copies of the waste profiles and all other supporting material for each waste.

The waste generator will provide a copy of the analytical results attached with the waste profile. The non-intrusive inspection will be conducted at the time the waste is received at the ICDF and documented by the ICDF manager or designee. Acceptance will be complete when the ICDF manager or designee signs the appropriate line on the waste profile.

The ICDF manager or designee can use the information contained on the waste profile to alert future disposal contractors of possible disposal restrictions. If, at the time of screening, the waste determination does not meet the profile, the ICDF management and operations team will work with the generating WAG until an accurate determination can be made or will arrange for further actions. If the waste is determined unacceptable for ICDF landfill disposal, and after consultation with the waste generators, temporary storage at the SSSTF may be an option, until suitable, off-site options are identified and secured.

3.4.1 Waste Profile Reevaluation Process

The ICDF Complex manager or designee will reevaluate a waste profile under the following conditions:

- The process generating the waste has changed
- Inspection or analysis indicates that the waste received at the SSA does not match the waste identified on the accompanying pre-acceptance documentation or is not in compliance with this Waste Management Plan (WMP).

When a profile is re-evaluated, the generator may request to do one or more of the following:

- Verify that the current waste profile is accurate
- Supply a new waste profile
- Look for alternative disposal
- Submit a sample for parameter analysis.

3.4.2 ICDF Special Case Waste Types

Special case waste will be accepted for temporary storage at the SSSTF until final disposal is determined. This may include disposal at the ICDF or to a disposal facility off-site. Potential for disposal at the ICDF is determined by this WAC. Special case waste that could potentially be accepted in the ICDF following review includes items such as large concrete monoliths, containers filled with grout so as to be non-crushable, or other debris types that require a geotechnical review to ensure they will not adversely impact landfill stability.

Acceptance criteria and/or restrictions associated with special-case waste types are identified in Table 3-2.

Table 3-2. ICDF WAC for special-case waste types.

Special-Case Waste Type	Acceptance criteria and/or restrictions
Asbestos	Asbestos-containing materials shall be managed in accordance with 40 CFR 61.140 through 157. Additional, and more detailed information for asbestos management is also supplied in the *Waste Management Plan for the Staging and Storage Annex* (DOE-ID 2001a).
Debris*	1. The initial determination of whether a waste is hazardous debris shall be made at the source in accordance with 40 CFR 268.45 and other applicable waste designation requirements. After waste has been identified as hazardous debris, it shall be so stated as part of the waste profile. 2. Unless exempted by the EPA, hazardous debris shall comply with the debris treatment standards (40 CFR 268.45) or the otherwise applicable LDR treatment standard. Although sampling of treated hazardous debris to demonstrate compliance is not required, documentation of conformance with the technology performance and operating or design standards shall be provided. Under the EPA rule, treated hazardous debris is excluded from the definition of hazardous waste, provided that the hazardous debris is treated to the performance or design and operation standards by an extraction or destruction technology and the treated hazardous debris does not exhibit a characteristic of hazardous waste.

* The definition of debris can be found in the Nomenclature section.

3.5 Waste Certification Process

3.5.1 Waste Certification Form

The certification program ensures generator responsibility and accountability of the waste being sent to the ICDF for disposal. The waste certification form, an example of which is shown in Appendix A, is attached to the waste profile after the waste is shipped to the SSSTF. The Waste Certification Form must be signed by the generating WAG manager or designee to certify that the waste meets appropriate requirements. The waste certification form will be recorded and maintained in accordance with DOE-ID policy and applicable ARARs.

3.5.2 Recertification

The recertification process will follow the same procedures listed for the Waste Profile Reevaluation Process in Section 3.4.1.

3.6 Verification as Packaged

The package verification process ensures that the waste is packaged in waste profile-approved containers prior to shipment.

3.7 Receipt Verification

Waste receipt verification will be performed by the ICDF Complex operations at the SSSTF. Receipt verification will be performed through a combination of inspection of the incoming shipment and cross-checks of the incoming waste against the waste profile in the electronic database and profile number for items like number, types, and labeling of containers (where applicable). Receipt verification will be described in detail in the SSSTF WAC (to be provided in the SSSTF 90% Design Document).

3.8 Non-Compliant Waste

Waste received at the ICDF Complex with non-compliant conditions shall require appropriate resolution prior to waste acceptance. Resolution alternatives may include, but are not limited to:

- Correction of the non-compliant condition at the SSSTF
- Conditional acceptance of the waste at the SSSTF
- Storage at an appropriate location until resolution of the issue.

The ICDF landfill will not accept non-compliant waste for disposal until the non-compliant condition is rectified. In addition to short-term rectification of the non-compliant condition to permit disposal, further steps shall be taken to determine the underlying cause of the problem and implement corrective actions as necessary to prevent recurrence. A recurrence of non-compliant shipments from a generator may result in termination of shipments until the issues have been resolved.

3.9 Records

All waste analysis and supporting information relative to LDR compliance shall be retained for a minimum of 5 years. The records and documents that will be kept and maintained include:

- Waste profiles and any accompanying forms (i.e., analytical results)
- Map/cell locations of wastes
- Chain-of-custody forms
- Inspection records
- Tank records until closed per 40 CFR 265, Subpart J, Idaho Administrative Procedures Act (IDAPA) 58.01.05.009
- Asbestos-TSCA waste records
- Audit, surveillance, and observations of generator's waste characterization activities

- Training records
- Any other applicable documentation.

3.10 Shipping

The waste-generating organization is required to prearrange the delivery time and date of all waste shipped to the ICDF Complex, and ensure that a chain-of-custody form accompanies all wastes brought to the ICDF Complex. These arrangements can be made during the initial contact, if the waste has been accepted for receipt. A shipment sent without prior arrangement may be rejected.

3.10.1 Transportation and Packaging

Packaging of CERCLA-generated waste shall be in compliance with the OU 3-13 ROD ARARs. Container specifications are listed in Table 3-3. Generators are required to reduce void spaces in containers as much as possible. See Section 5.4 for requirements.

Table 3-3. Container specification.

Waste Type	35-Gallon Barrel or 55-Gallon Drum[a]	Roll-Off Containers[a]	Dump Trucks	Vulcan Boxes 68.5 in. x 45 in. x 36.5 in.	INEEL Wood Boxes[a] 2 x 4 x 8 ft / 4 x 4 x 4 ft / 4 x 4 x 8 ft
Hazardous	X	X	X	X	X
RAD[b]	X	X	X	X	X
RAD & Mixed RAD[b]	X	X	X	X	X
Asbestos-TSCA	X	NA	NA	NA	NA
Asbestos-TSCA/RAD Waste[b]	X	NA	NA	NA	NA
Case-by-Case[c]	X	NA	NA	X	X

a. Drums, roll-offs, and INEEL wood boxes may be lined with polyethylene liners (or supersacks). Roll-off containers will have covers.

b. Low-level radioactive waste shall be packaged for disposal in accordance with 10 CFR 61.56(a). The container must also be surveyed to ensure occupational exposures to radiation are < 500 mR/h at 1 meter for the exterior of the container. If the container's radiation is > 500 mR/h, the container must be shielded by other containers while within the SSA.

c. Wastes accepted on a case-by-case basis could require special container requirements. Therefore, the generator must verify proper containers with 49 CFR, 101, Subpart C.

NOTE: Other types of containers may be used if they have received approval prior to shipment.

CERCLA-generated waste materials must be stored and transported in containers that are in good condition, are compatible with the waste, and meet Department of Transportation (DOT) specifications. The DOT regulations, which provide standards for properly packaging hazardous material and hazardous waste (49 CFR 172), must be followed to determine the proper containers for the management of each waste stream.

3.10.2 Shipping Documentation

All waste transported on public roadways (between the TAN and the ICDF Complex, and between the RWMC and the ICDF Complex) shall be shipped in compliance with applicable DOT regulations. When applicable, a February 12, 1997, Federal Register (62 FR 6622) rule change allows non-manifested waste as follows:

The manifesting requirements in 40 CFR Part 262, Subpart B and the pre-transport marking requirements in Section 262.32(b) do not apply to the transport of hazardous waste along the border of contiguous property under the control of the same person, even if such contiguous property is divided by a public or private right-of-way (Section 262.20[f]). Further details will be included in the SSSTF WAC (to be provided in the SSSTF 90% Design Document).

3.10.3 Authorization to Ship

The CERCLA project generating the waste must receive authorization from the ICDF Complex management to ship waste. The waste-generating organization is required to prearrange the delivery time and date of all waste shipped to the ICDF Complex prior to disposal at the ICDF and to ensure that waste profile and chain-of-custody forms accompany all wastes brought to the ICDF Complex. A shipment sent without prior arrangement may be rejected. A detailed procedure will be found in the SSSTF WAC (to be provided in the SSSTF 90% Design Document).

4. WASTE ACCEPTANCE BASIS

4.1 Criteria Basis

The ICDF landfill is authorized to accept CERCLA waste from INEEL activities consistent with the OU 3-13 ROD. Only CERCLA waste will be accepted for disposal to the ICDF.Inactive treatment, storage, and disposal, RCRA past-practice, and decontamination and dismantlement (D&D) waste may be placed in the ICDF landfill through a CERCLA ROD or CERCLA removal action memorandum issued in accordance with CERCLA and the NCP. Waste that has not been coordinated in accordance with the waste acceptance process defined in Section 2.2 shall not be accepted at the ICDF landfill.

The basis for acceptance criteria includes protection of human health and the environment, protection of the ICDF landfill liner system, control of waste form, compliance with environmental regulations (ARARs) as authorized by the OU 3-13 ROD, and development of a chemical, radiological, and physical WAC.

4.1.1 Remedial Design Analysis

The WAC is based on the Design Basis Inventory (DOE-ID 2001b) and the results of the studies summarized in Table 4-1.

Table 4-1. Summary of ICDF study results influencing the ICDF WAC.

Document	Summary of results
Permeable Reactive Barrier Evaluation Study (DOE-ID 2001c)	A Permeable Reactive Barrier would not increase protection of human health and the environment over the ICDF design with a low-infiltration cover.
Leachate/Contaminant Reduction Time Study (DOE-ID 2001d)	This study provides the content of a hypothetical ICDF leachate based on the Design Basis Inventory (DOE-ID 2001a). It provides the modeled composition of the leachate during the operations period, taking into account solubility, soil-water partitioning, and radioactive decay, using a combination of K_d s and geochemistry modeling. An operational period of 15 years was assumed for the ICDF landfill.
Fate and Transport Modeling Results Summary Report (DOE-ID 2001e)	This study estimated contaminant fate and transport (100,000 year simulations) through the vadose zone to a hypothetical monitoring well located 20 meters (m) downgradient of the ICDF in the SRPA.
Waste-Soil Design Ratio Calculations (DOE-ID 2001f)	These calculations were performed for various types of solid debris varying from rubble to cement monoliths. The soil/waste radio depends on the size and the shape of the non-soil waste and varies from 2:1 to 19:1.
Hydrologic Modeling of Final Cover (DOE-ID 2001g)	The model was used to evaluate long-term infiltration rates through the landfill cover section for the ICDF. The climatic parameters were actual data from the 10 years most representative of the average (50th percentile) and years with greater than the 90th percentile of recorded annual precipitation.
Liner/Leachate Compatibility Study (DOE-ID 2001h)	This study indicates that the main chemical threat to the ICDF would be organic constituents. Organic constituents would have to be present at concentrations several orders of magnitude higher than the Design Basis Inventory organic constituents before they could be considered a problem for liner computability.

4.1.2 Protection of Human Health and the Environment

Worker protection shall be provided by compliance with the requirements of the site-specific health and safety plan for the ICDF operations.

The waste handling at the ICDF landfill shall be consistent with ALARA requirements for maintaining worker exposure, in accordance with DOE Order 5400.5. The primary long-term routes of exposure to hazardous constituents and the radionuclides that are of concern after placement of waste in the ICDF landfill include the ingestion of contaminated groundwater or intrusion into the waste.

4.1.3 Protection of the ICDF Landfill Liner System

A compatibility study of materials proposed for the ICDF landfill liner system and expected waste leachate was performed as part of the Liner/Leachate Compatibility Study," (DOE-ID 2001h). The study concluded that the manufacturer-recommended limits associated with the HDPE geomembrane liners were several orders of magnitude higher than the estimated maximum ICDF landfill leachate concentrations. Based on results of the study, hazardous constituent concentration limits necessary to ensure liner integrity are listed in EDF-ER 278. The study did not show any threat to the liner from radionuclides present in the waste to be managed at the ICDF landfill. Waste with constituents in sufficient concentration that could result in loss of liner integrity shall not be accepted.

The ICDF landfill management and operations team shall evaluate waste with chemical constituents not listed in this section on a case-by-case basis. The evaluation shall consist of a paper study showing that the new waste constituents are chemically equivalent to an approved constituent. If chemical equivalency cannot be determined through a paper study, EPA Method 9090 (EPA 1986) may be required to show that leachate from the proposed waste is compatible with the liner material. The results of the case-by-case analysis will be documented and retained at the ICDF Complex.

4.1.4 Compliance with ARARs

The ICDF is a part of a CERCLA Remedial Action (RA), and the ARARs are clearly identified in the OU 3-13 ROD. Compliance with these ARARs is documented in the ARARs cross-walk for the ICDF Complex, which is found in Appendix C of the "INEEL CERCLA Disposal Facility Remedial Design/Remedial Action Work Plan," (DOE-ID 2001i).

5. ACCEPTANCE CRITERIA FOR THE ICDF LANDFILL

5.1 Prohibited Waste

The materials prohibited from disposal at the ICDF are described in this section.

5.1.1 Transuranic Constituent Waste>10 nCi/g

Waste containing greater than 10 nCi/g of TRU radionuclides is prohibited from disposal at the ICDF as per the OU 3-13 ROD.

5.1.2 TSCA Waste Containing > 500 ppm PCBs

TSCA waste containing greater than 500 ppm of PCBs is prohibited from disposal at the ICDF, per 40 CFR 761.50. No waste greater than 500 ppm of PCBs is expected, based on the inventory described in "CERCLA Disposal Facility Design Inventory" (DOE-ID 2001a).

5.1.3 Hazardous Waste

Hazardous waste from outside the WAG 3 AOC, or hazardous waste from inside the WAG 3 AOC that has triggered placement, is prohibited from disposal at the ICDF unless it meets RCRA Land Disposal Restrictions of 40 CFR 268, 40 CFR 268.45 (Treatment Standards for Hazardous Debris) or 40 CFR 268.49 (Alternative LDR Standards for Contaminated Soil). Hazardous waste is defined in 40 CFR 261 Subparts C and D of the RCRA. The ICDF cannot accept D-code characteristic waste, F-listed wastes, and most P-code and U-code wastes from outside the AOC or wastes that have triggered placement as defined by RCRA, which are above LDR requirements. Waste characterization will be based on comparison to the TCLP regulatory levels. If total heavy metals concentrations exceed the TCLP regulatory levels for characteristic waste by the application of the 20X rule, then TCLP analysis will be necessary to determine if the waste is RCRA characteristic. For wastes containing organic constituents that would cause the waste to be characteristic by TCLP, the constituent must be present below the applicable LDR and UST levels for the waste to be accepted into the ICDF. In the case of organic constituents, concentrations below the 20X rule can be used to show a TCLP analysis is not required. For concentrations over 20X, if other information is not available to quantitatively show the waste is not hazardous, a TCLP analysis will be performed.

5.1.4 Free Liquids

Wastes containing free liquids are prohibited from disposal at the ICDF, unless the liquids have been stabilized. Table 5-1 lists the stabilization requirements.

5.1.5 Other Prohibited Wastes

Other wastes prohibited from disposal at the ICDF are listed below. The QA program will include a determination that no prohibited wastes are accepted for disposal to the ICDF.

1. Waste capable of detonation, explosive decomposition or reaction at normal pressures and temperature, or explosive reaction with water (DOE 1999a). This includes unreacted alkali metal (e.g., sodium). Chemicals that react with atmospheric oxygen to form shock-sensitive organic peroxides are prohibited at concentrations that are capable of generating an explosive reaction.

2. Waste capable of generating toxic gases, vapors, or fumes harmful to persons transporting, handling, and disposing the waste (DOE 1999a).

3. Gaseous waste packaged at a pressure in excess of 1.5 atmospheres at 2°C (6°F) (DOE 1999a).

4. TRU waste (1999a).

5. Waste exceeding the Class C limit, as defined in 10 CFR 61.55.

6. Waste containing greater than 1% chelating compounds by weight.

7. PCBs > 500 ppm (40 CFR 761.50).

8. Waste containing TRU constituents > 10 nCi/g (DOE 1999b).

9. Spent nuclear fuel and high-level waste (DOE 1999a).

Table 5-1. Materials restricted from disposal at the ICDF landfill until the listed conditions have been met.

Restricted Material	Condition to be Met
Bulk disposal of waste containing free liquids	Free liquids must be eliminated by stabilization (adding materials to chemically immobilize the free liquids in the waste).
	If necessary, the presence of free liquids shall be determined by EPA Method 9095 ("Paint Filter Liquids Test") (EPA 1986) before shipment to the ICDF 40 CFR 264.314[d]).
Containerized waste holding free liquids, unless one of the following conditions has been met:	All freestanding liquid has been decanted, solidified with nonbiodegradable sorbent materials, stabilized, or otherwise eliminated[a].
	The (nonhazardous) waste has been converted into a form that contains as little freestanding and noncorrosive liquid as is reasonably achievable. In no case shall the liquid exceed 1% of the waste volume in a disposal container or 0.5% of the waste volume processed to a stable form[a].
Refrigerant-bearing equipment containing chlorofluorocarbons (CFCs)	CFC removal has been completed (40 CFR 82).
Pyrophoric waste	Must be treated, prepared, and packaged to be nonflammable prior to being disposed.
Infectious waste, as defined in 10 CFR 61 (including "any substance that may harbor or transmit pathogenic organisms," which may apply to septic tank sludge)	Must be disinfected.
TNT RDX	Waste not capable of detonation, explosive decomposition, or reaction at normal pressures and temperature, or explosive reaction with water.

a. A procedure for determination of free liquids will be developed and incorporated into the ICDF O&M Manual.

5.2 Physical and Chemical Criteria

5.2.1 Liquid and Liquid-Containing Waste

For liquid-containing waste where condensate could form in inner plastic packaging (e.g., bags) subsequent to packaging, the condensate shall be eliminated to the maximum extent practical by placing sorbents within the inner plastic packaging. In any case, the amount of liquid may not exceed 1% of the volume of the waste or 0.5% of waste processed to a stable form.

Residual liquids in large debris items shall be sorbed or removed. In cases where removing suspected liquids is not practical and sampling to determine if liquids are present is impossible, the liquids shall be removed to the maximum extent possible by draining suspected liquids at low points and placing an adequate amount of sorbent around each item. In any case, the amount of liquid cannot exceed 1% of the volume of the waste.

5.2.2 Land Disposal Restrictions

The application of LDRs for waste that is either listed waste or characteristic waste depends on whether a waste originates from inside the WAG 3 AOC or has triggered placement.

5.2.3 Within AOC Wastes

Waste originating inside the OU 3-13 AOC that has not triggered placement is acceptable for direct disposal in the ICDF landfill without the need to meet the RCRA LDRs specified in the OU 3-13 ROD (DOE-ID 1999b) inside AOC Chemical WAC. Within the AOC, the WAC for each hazardous constituent will be calculated based on the risk Remedial Action Objectives (RAOs) identified in the OU 3-13 ROD, including risk via groundwater ingestion pathway and no exceedence of MCLs. The logic for determining the allowable WAC concentration for each constituent from inside the AOC is shown in Figure 5-1.

Table 5-2. ICDF landfill acceptance requirements for organic hazardous waste constituents.

Hazardous Waste Constituent	Acceptance Requirements
TO BE COMPLETED at 90% Design	

Table 5-3. ICDF landfill acceptance requirements for inorganic hazardous waste constituents.

Hazardous Waste Constituent	Acceptance Requirements
TO BE COMPLETED at 90% draft	

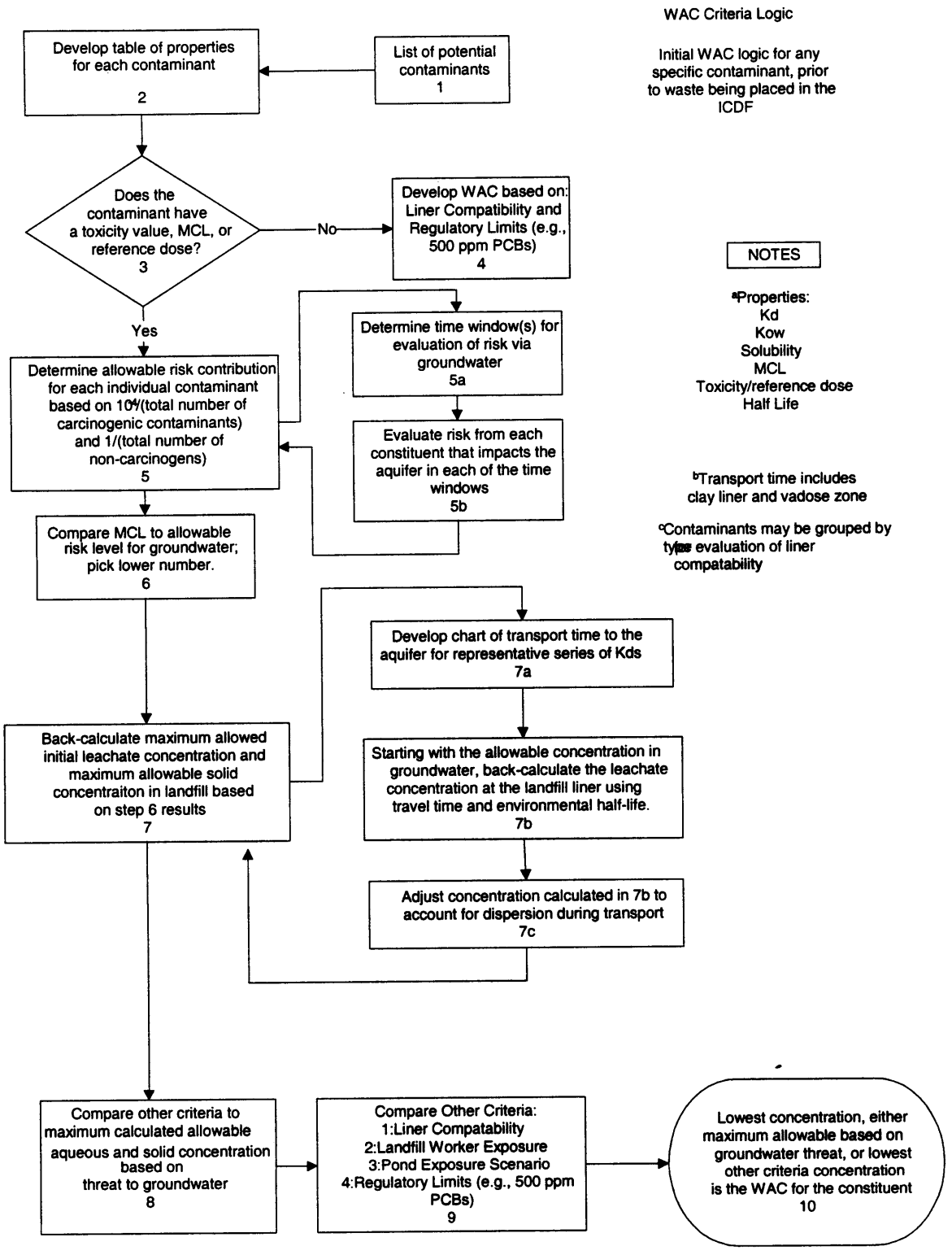

Figure 5-1. ICDF WAC criteria flow chart.

5.2.4 Outside of AOC Wastes and AOC Wastes that Have Triggered Placement

Wastes originating from outside the AOC or that have triggered placement must comply with RCRA ARARs for land disposal. Waste must meet the LDR restrictions for both listed and characteristic wastes, as listed in Table 2-1, and as found in 40 CFR 268.49. Wastes that have been treated to meet the LDR for characteristic waste must also meet the UTS for underlying hazardous constituents. Determination of whether a waste is listed or characteristic must be performed by the generator and documented on the waste profile.

ICDF users shall determine whether waste is subject to RCRA LDRs by completing a hazardous waste determination (HWD). If the waste is determined to be hazardous, the user will be responsible for evaluating concentrations for the constituents of concern against the applicable treatment standards or prohibition levels. The federal treatment standards and prohibition levels that apply to LDR waste are published in 40 CFR 268 and 40 CFR 264.48 (LDR treatment standards for soils) and a limited list of treatment standards is provided in Table 5-4. For waste that is hazardous by characteristic, the underlying hazardous constituents specified in 40 CFR 268.48, UTS that can reasonably be expected to be present at the point of generation of the hazardous waste shall also be evaluated. All waste analysis and supporting information relative to LDR compliance shall be retained for a minimum of 5 years.

Waste profile documentation for all hazardous waste shipped to the ICDF Complex shall include information similar to that found in 40 CFR 268.7, including waste code and applicable treatment standard, subcategory, and underlying hazardous constituents. If the treatment standard is expressed in terms of a concentration limit, the actual concentration of the restricted constituent shall also be reported. If the waste has no listed waste codes and no longer exhibits the characteristic of a hazardous waste because it has been treated, the waste certification form shall include a statement describing the treatment technology that was used and the reason the waste is no longer hazardous.

Table 5-4. LDR limits for selected hazardous wastes.

Waste Code	Waste Description	Regulated Hazardous Constituent	Regulatory Standard (mg/kg total, unless noted otherwise)
D001	Ignitable characteristic waste for high TOC[b] subcategory	NA	Deactivate and meet UTS[c]
D001	High TOC ignitable characteristic waste (>10% TOC)	NA	Prohibited from disposal in ICDF
D002	Corrosive characteristic waste	NA	Deactivate and meet UTS
D003	Reactive waste–water reactive subcategory	NA	Deactivate and meet UTS
D003	Reactive cyanides subcategory	Cyanides (total)	590
		Cyanides (amenable)	30
D004	Wastes that are toxic for arsenic based on TCLP	Arsenic	5.0 mg/L TCLP and meet UTS
D005	Wastes that are toxic for barium based on TCLP	Barium	21 mg/L TCLP and meet UTS
D006	Wastes that are toxic for cadmium based on TCLP	Cadmium	0.11 mg/L TCLP and meets UTS
D007	Wastes that are toxic for chromium based on TCLP	Chromium (Total)	0.60 mg/L TCLP and meet UTS

Table 5-4. (continued).

Waste Code	Waste Description	Regulated Hazardous Constituent	Regulatory Standard (mg/kg total, unless noted otherwise)
D008	Wastes that are toxic for lead based on TCLP	Lead	0.75 mg/L TCLP and meet UTS
D008	Radioactive lead solids (e.g., lead shielding and elemental lead)	Lead	Macroencapsulation
D009	Wastes that are toxic for mercury based on TCLP and that contain less than 260 mg/kg total mercury	Mercury	0.20 mg/L TCLP and meet UTS
D009	Elemental mercury contaminated with radioactive materials	Mercury	Amalgamation
D010	Wastes that are toxic for selenium based on TCLP	Selenium	5.7 mg/L TCLP and meet UTS
D011	Wastes that are toxic for silver based on TCLP	Silver	0.14mg/L TCLP and meet UTS
D012	Wastes that are toxic for endrin based on TCLP	Endrin Endrin aldehyde	0.13 and meet UTS
D013	Wastes that are toxic for lindane based on TCLP	Alpha-BHC Beta-BHC Delta-BHC Gamma-BHC (lindane)	0.066 and meet UTS
D014	Wastes that are toxic for methoxychlor based on TCLP	Methoxychlor	0.18 and meet UTS
D015	Wastes that are toxic for toxaphene based on TCLP	Toxaphene	2.6 and meet UTS
D016	Wastes that are toxic for 2,4-D based on TCLP	2,4-D	10 and meet UTS
D017	Wastes that are toxic for 2,4,5-TP (silvex) based on TCLP	2,4,5-TP (silvex)	7.9 and meet UTS
D018	Wastes that are toxic for benzene based on TCLP	Benzene	10 and meet UTS
D019	Wastes that are toxic for carbon tetrachloride based on TCLP	Carbon tetrachloride	6.0 and meet UTS
D020	Wastes that are toxic for chlordane based on TCLP	Chlordane	0.26 and meet UTS
D021	Wastes that are toxic for chlorobenzene based on TCLP	Chlorobenzene	6.0 and meet UTS
D022	Wastes that are toxic for chloroform based on TCLP	Chloroform	6.0 and meet UTS

Table 5-4. (continued).

Waste Code	Waste Description	Regulated Hazardous Constituent	Regulatory Standard (mg/kg total, unless noted otherwise)
D023	Wastes that are toxic for o-cresol based on TCLP	o-Cresol	5.6 and meet UTS
D024	Wastes that are toxic for m-cresol based on TCLP	m-Cresol	5.6 and meet UTS
D025	Wastes that are toxic for p-cresol based on TCLP	p-Cresol	5.6 and meet UTS
D026	Wastes that are toxic for cresols (total) based on TCLP	Cresols	11.2 and meet UTS
D027	Wastes that are toxic for 1,4-dichlorobenzene based on TCLP	1,4-Dichlorobenzene	6.0 and meet UTS
D028	Wastes that are toxic for 1,2-dichloroehtane based on TCLP	1,2-Dichloroethane	6.0 and meet UTS
D029	Wastes that are toxic for 1,1-dichloroethylene based on TCLP	1,1-Dichloroethylene	6.0 and meet UTS
D030	Wastes that are toxic for 2,4-dinitrotoluene based on TCLP	2,4-Dinitrotoluene	140 and meet UTS
D031	Wastes that are toxic for heptachlor based on TCLP	Heptachlor Heptachlor epoxide	0.066 and meet UTS
D032	Wastes that are toxic for hexachlorobenzene based on TCLP	Hexachlorobenzene	10 and meet UTS
D033	Wastes that are toxic for hexachlorobutadiene based on TCLP	Hexachlorobutadiene	5.6 and meet UTS
D034	Wastes that are toxic for hexachloroethane based on TCLP	Hexachloroethane	30 and meet UTS
D035	Wastes that are toxic for methyl ethyl ketone based on TCLP	Methyl ethyl ketone	36 and meet UTS
D036	Wastes that are toxic for nitrobenzene based on TCLP	Nitrobenzene	14 and meet UTS
D037	Wastes that are toxic for pentachlorophenol based on TCLP	Pentachlorophenol	7.4 and meet UTS
D038	Wastes that are toxic for pyradine based on TCLP	Pyradine	16 and meet UTS
D039	Wastes that are toxic for tetrachloroethylene based on TCLP	Tetrachloroethylene	6.0 and meet UTS
D040	Wastes that are toxic for trichloroethylene based on TCLP	Trichloroethylene	6.0 and meet UTS
D041	Wastes that are toxic for 2,4,5-trichlorophenol based on TCLP	2,4,5-Trichlorophenol	7.4 and meet UTS
D042	Wastes that are toxic for 2,4,6-trichloropheneol based on TCLP	2,4,6-Trichlorophenol	7.4 and meet UTS
D043	Wastes that are toxic for vinyl chloride	Vinyl chloride	6.0 and meet UTS

Table 5-4. (continued).

Waste Code	Waste Description	Regulated Hazardous Constituent	Regulatory Standard (mg/kg total, unless noted otherwise)
	based on TCLP		
F001, F002, F003, F004, F005	Listed spent solvent wastes	Acetone	160
		Benzene	10
		n-Butyl alcohol	2.6
		Carbon disulfide	(See 40 CFR 268)
		Carbon tetrachloride	6.0
		O-Cresol	5.6
		m-Cresol	5.6
		p-Cresol	5.6
		Cresol mixtures	11.2
		Cyclohexanone	(See 40 CFR 268)
		o-Dichlorobenzene	6.0
		Ethyl acetate	33
		Ethyl benzene	10
		Ethyl ether	160
		Isobutyl alcohol	170
		Methanol	(See 40 CFR 268)
		Methylene chloride	30
		Methyl ethyl ketone	36
		Methyl isobutyl ketone	33
		Nitrobenzene	14
		Pyridine	16
		Tetrachloro-ethylene	6.0
		Toluene	10
		1,1,1-Trichloroethane	6.0
		1,1,2-Trichloroethane	6.0
		1,1,2-Trichloro-1,2,2-trifluoroethane	30
		Trichloroethylene	6.0
		Trichloromonofluoro methane	30
		Xylenes	30
		Chlorobenzene	6.0

Table 5-4. (continued).

Waste Code	Waste Description	Regulated Hazardous Constituent	Regulatory Standard (mg/kg total, unless noted otherwise)

a. HOC (halogenated organic compounds)

b. TOC (total organic compounds)

c. Universal Treatment Standards

Note: Table represents a partial list of waste codes most likely to be encountered during remediation activities at the INEEL site. 40 CFR 268 should be consulted to confirm the most current standard.

5.2.5 Solidification or Stabilization of Organic Liquids and Chelating Compounds

Organic liquids and chelating compounds exceeding 1% of the waste by weight must be solidified or stabilized to a form that immobilizes the organic and chelating compounds. Selection and use of solidification and stabilization agents shall be in accordance with the WTP for the CERCLA action generating the waste.

5.2.6 Asbestos-Containing Waste

Asbestos-containing waste should be sent to the CFA Bulk landfill unless the radionuclide content of the waste prevents this disposal. If the waste is radioactive, then asbestos-containing waste material shall be packaged in accordance with 40 CFR 61.150. Wetting with water is allowed as long as it does not exceed applicable free liquid requirements. Disposal of asbestos waste will be in accordance with applicable state and federal regulations.

5.2.7 Heat Generation

If heat generation from radiological decay in the waste package exceeds 3.5 watts per cubic meter (0.1 watt per cubic ft), the package must be evaluated using the conversion factors in Appendix B to ensure that the heat does not affect the integrity of the container or surrounding containers in the ICDF. This evaluation must be provided to and approved by the ICDF Complex management. As noted in Section 2.4.2, incompatible wastes will not be accepted.

5.2.8 Gas Generation

Gas generation from radiolytic or biological decomposition of containerized waste must be controlled to prevent pressurization exceeding 1.5 atmospheres (152 kilopascals absolute pressure), and combustible gas (e.g., hydrogen, methane) concentrations exceeding the lower explosive limit during handling before disposal.

5.3 Radiological Criteria

5.3.1 Radiological Concentration Limits

Restrictions on the activity of radionuclides that can be placed in the ICDF landfill were determined in an iterative process that involved the RD/RA documents discussed in Section 2.1.1. In anticipation that wastes not currently in the inventory will be discovered, the WAC is based on a combination of the total allowable inventory of radionuclides that may impact groundwater, and the

protection to worker health and safety. Waste containing greater than 10 nCi/g of TRU isotopes based on waste stream sampling will not be accepted.

Limits established for radionuclides are identified in Table 5-5. Where there are two or more radionuclides present in a waste, the "sum of the fractions" method, as outlined in Appendix B, shall be used to determine acceptability. Certain waste sources may require special handling to accommodate disposal at the ICDF landfill even though the radionuclide concentrations are less than the limits shown in Table 5-5. Handling requirements for these waste sources shall be evaluated on a case-by-case basis. If the inventory concentration of the waste source is below the Class C limits, the waste is then acceptable for transportation and disposal at the ICDF landfill.

Table 5-5. Radiological concentration (activity) limits.

Radionuclide	Allowable Activity (pCi/g)	Allowable Total inventory (Ci)
	(to be completed in 90% submittal)	

5.3.1.1 Waste Containing Greater Than 10 nCi/g of TRU Constituents. The ICDF landfill will not accept waste containing >10 nCi/g of TRU constituents.

5.3.2 Criticality Safety Limits

At the present time, there are no wastes identified for disposal that might approach criticality limits. However, should such waste be identified, the generator would be required to provide all documentation to demonstrate that disposal in the ICDF landfill would not approach criticality. In this case, the auditable safety analysis will demonstrate, through analysis, that the facility is a Radiological Low Hazard facility where criticality is not credible due to the quantity and form of the material. These documents are still in the development stage.

5.3.3 Package External Concentration Limits

Removable contamination on accessible surfaces of waste packages shall not exceed the limits of the INEEL Site Radiological Control Manual (LMITCO Manual #15A).

5.3.4 Package Dose Rate Limits

Contact-handled waste shall not exceed 1 milliSievert per hour (100 mrem/hr) at 30 centimeters (cm) (1 ft) from the waste package and 2 milliSieverts per hour (200 mrem/hr) on the surface of the package, except that a package larger than 208 liters may have a marked point on the bottom or side with a surface dose rate of up to 10 milliSieverts per hour (1,000 mrem/hr) as long as the 30 cm dose rate limit is not exceeded.

Remote-handled waste shall meet the applicable dose rate restrictions of DOT or an approved packaging safety analysis. Remote-handled waste shall be configured for unloading such that personnel exposures are maintained ALARA.

5.4 Packaging Criteria

Packaging of CERCLA-generated waste shall be in compliance with the OU 3-13 ROD ARARs. Container specifications are listed in Table 5-6. Generators are required to reduce void spaces in containers as much as possible. There should not be void spaces greater than 5.1 cm (2 in.) in diameter.

Table 5-6. Container specification.

Waste Type	35-Gallon Barrel or 55-Gallon Drum[a]	Roll-Off Containers[a]	Dump Trucks	Vulcan Boxes 68.5 in. x 45 in. x 36.5 in.	INEEL Wood Boxes[a] 2 x 4 x 8 ft; 4 x 4 x 4 ft; 4 x 4 x 8 ft
Hazardous	X[d]	X	X	X	X
RAD[b]	X	X	X	X	X
RAD and Mixed RAD[b]	X	X	X	X	X
Asbestos-TSCA	X	NA[e]	NA	NA	NA
Asbestos-TSCA/RAD Waste[b]	X	NA	NA	NA	NA
Case-by-Case[c]	X	X	NA	X	X

a. Drums, roll-offs, and INEEL wood boxes may be lined with polyethylene liners (or supersacks). Roll-off containers will have covers.

b. Low-level radioactive waste shall be packaged for disposal in accordance with 10 CFR 61.56(a). The container must also be surveyed to ensure occupational exposures to radiation are < 500 mR/h at 1 meter for the exterior of the container. If the containers radiation is > 500 mR/h, the container must be shielded by other containers while within the SSA.

c. Wastes accepted on a case-by-case basis could require special container requirements. Therefore, the generator must verify proper containers with 49 CFR, 101, Subpart C.

d. X = Applicable

e. NA = Not applicable

NOTE: Other types of containers may be used if they have received approval prior to shipment.

CERCLA-generated waste materials must be stored and transported in containers that are in good condition, are compatible with the waste, and meet the DOT specifications. The DOT regulations, which provide standards for properly packaging hazardous material and hazardous waste (49 CFR 172), must be followed to determine the proper containers for the management of each waste stream.

Packaging of all waste materials designated for ICDF disposal will be in compliance with DOT regulations and RCRA regulations found in 40 CFR 264 Subparts I and J. The ICDF Complex designee should be consulted prior to the generation of any new waste, to identify the specific types of containers required for the anticipated wastes.

5.4.1 Outer Packages

Information regarding this section is still pending and will be supplied in the 90% Design Document.

5.4.2 Condition of Containers

Outer containers shall be in good condition, with no visible cracks, holes, bulges, substantial corrosion, or other damage that could compromise integrity.

5.4.3 Package Construction

Table 5-6 above indicates the construction of acceptable packaging.

5.4.4 Securing Waste and Shielding

Large heavy items must be secured in containers by bracing, blocking, or other means to prevent damage to the container during handling and transportation. When shielding is used to reduce the surface dose rate of a waste container, the shielding and waste must be secured to prevent shifting during handling and transportation.

5.4.5 Handling Packages

All packages must be configured for safe unloading by forklift or crane. Alternate means of unloading may be allowed with approval from the ICDF Complex management or designee. Packages that must be unloaded by crane shall be equipped with a lifting system designed to safely lift the fully loaded package. All slings and lifting devices shall meet the requirements of the DOE hoisting and rigging standards (DOE 1996). For packages that have special unloading requirements, the generator must provide the unloading requirement information to the ICDF Complex management c when the waste is profiled.. Sacrificial rigging shall be provided for remote-handled waste packages. Rigging shall not contain regulated materials, such as lead.

5.4.6 Minimizing Subsidence

All waste shall be packaged in a form that minimizes settling and subsidence of the ICDF landfill to the maximum extent feasible. The following forms will be considered to meet these criteria.

- Inherently stable waste that will not subside in the disposal environment
- Waste stabilized by grouting or packaging
- Containerized soil and soil-like solids, sorbed liquids, and waste compacted to a minimum of 20 pounds per square in. that fills at least 95% of the volume of the container
- Other containerized waste that fills at least 95% of the internal volume of the container.

Any void fillers must be selected and used in accordance with the requirements of this WAC.

5.4.7 Labeling

Waste containers shall be labeled as described in the following sections. Bulk waste are exempt from labeling requirements at the ICDF landfill. For unusual waste forms, special labeling provisions can be arranged with the ICDF Complex organization. Table 5-7 indicates the label specified for each type of waste.

Table 5-7. Label identification table.

Waste Type	Radioactive	CERCLA Waste	PCB Waste	Pending Sampling and Analysis	CERCLA Database Barcode Label
Hazardous Waste	NA	X	NA	NA	X
RAD	X	X	NA	NA	X
RAD and Mixed RAD	X	X	NA	NA	X
TSCA (Asbestos waste only)	X	X	X	NA	X
Other Asbestos/RAD Waste	X	X	X	X	X
Case-by-Case (waste dependent)	X	X	X	X	X

a. NA = Not applicable
b. X = Applicable

All containers used for waste storage must be properly labeled in accordance with both EPA and DOT requirements before delivery to the ICDF Complex. Each manager generating waste will ensure that each drum/container is properly marked and labeled, first while the waste is accumulated, and again before the waste is moved from the WAG site.

The marking on the containers must always be clearly visible for inspection of each container, and all container labels must be placed where they are clearly visible during storage and shipment. Drums will be labeled the on top and on one side. Boxes will be labeled on the top and on two opposing sides of the container. During shipment to the ICDF Complex, a container must also display DOT labels, manifest number, gross weight, and the shipper's complete name and address. Containers of waste shall not be opened, handled, or stored in a manner that will cause leakage (40 CFR 265.173(b), IDAPA 58.01.05.009).

5.4.7.1 Radioactive Waste. As required by the INEEL Radiological Control Manual (DOE 1996), radiation labels will be completed by a Radiation Control Technician (RCT) and placed on the top and on two opposing sides of the container.

5.4.7.2 CERCLA Waste. Standardized labels are available that provide the required information and blanks for site-specific information. All CERCLA remediation waste will be labeled with a "CERCLA Waste" label that includes an accumulation start date, waste description, applicable codes, and the generator's name. Figure 5-2 provides an example of a standard label.

5.4.7.3 TSCA Waste Labels. Asbestos-containing material with excessive radioactivity levels may be a candidate for the ICDF Complex. Generators will obtain labels from CFA for asbestos labeling and all asbestos-containing material will be labeled per the Site Asbestos Program.

5.4.8 Bulk (Non-Containerized) Waste

The majority of waste is expected to be disposed in the ICDF in bulk. This waste may arrive in roll-off containers, dump trucks, or other containers. This includes soil, building rubble, and other homogeneous waste having relatively low concentrations of radionuclides and hazardous chemical constituents.

Waste streams that comply with the ICDF WAC including the bulk criteria in the following sections can be accepted for disposal at ICDF as bulk shipments. Waste streams that comply with the ICDF WAC but do not meet these bulk criteria will be evaluated on a case-by-case basis by ICDF Complex management for ICDF disposal.

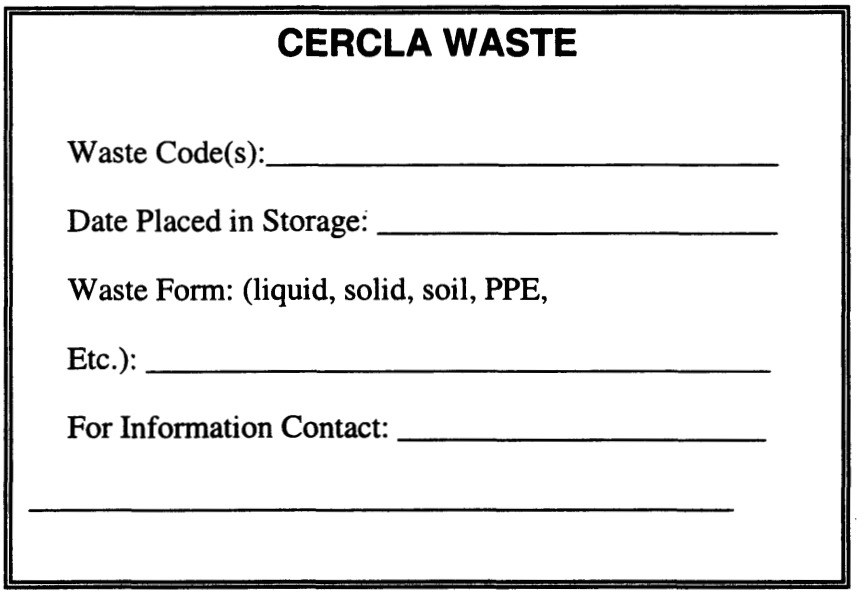

Figure 5-2. Standard CERCLA waste label.

5.4.8.1 Radiological Contamination Limits. Information regarding this section is still pending and will be supplied in the 90% design document.

5.4.8.2 Physical Limits. Physical requirements may influence the disposal of certain waste types to the ICDF landfill, even when the waste satisfies other ICDF landfill WAC. Physical waste characteristics such as weight, volume, dimensions, or length may require adjustment before the waste is accepted for disposal.

Table 5-8 identifies the physical limits and restrictions that must be met before the waste types will be considered for disposal at the ICDF landfill.

Table 5-8. Physical limits for waste proposed for disposal at the ICDF landfill.

Waste Type	Limits and Restrictions
Steel Boxes	Steel boxes are assumed to be completely filled and, therefore, uncompressible. Steel boxes with greater than 5% void space will not be accepted.
Concrete Debris	Concrete may be sent to the ICDF in one of two different forms: 1. Reduced to rubble with a maximum dimension of approximately 1 ft. It is preferred that this rubble be mixed with other waste soil so that it can be handled as soil at the ICDF. 2. Large blocks or slabs may be shipped under the following criteria: • It must not exceed the gross weight limit for the container • It must not extend above the side walls of the container • It shall not exceed 20 ft in length, and must be loaded toward the rear of the box • All rebar must be cut flush with the surface.
Steel Plate	Steel plate shall not exceed 4 ft in width or 20 ft in length. Steel plate shall not be bent over or folded, so that the waste can be placed and compacted with the same construction equipment used to compact the soil wastes.
Rebar	Rebar should be cut to lengths of approximately 4 ft and mixed with soil to the extent practical. Rebar pieces from D&D projects where soil is not common can be placed in bulk roll-off containers with other hard debris.

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