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Radiological, Physical, and Chemical Characterization of Low-Level Alpha Contaminated Wastes Stored at the Idaho National Engineering Laboratory

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ABSTRACT

This document provides radiological, physical, and chemical characterization data for low-level alpha-contaminated radioactive and low-level alpha-contaminated radioactive and hazardous (i.e., mixed) wastes stored at the Idaho National Engineering Laboratory and considered for treatment under the Private Sector Participation Initiative Program. Waste characterization data are provided in the form of INEL Waste Profile Sheets. These documents provide, for each content code, information on waste identification, waste description, waste storage configuration, physical/chemical waste composition, radionuclide and associated alpha activity waste characterization data, and hazardous constituents present in the waste. Information is provided for 97 waste streams which represent an estimated total volume of 25,450 m³ corresponding to a total mass of approximately 12,000,000 kg. In addition, considerable information concerning alpha, beta, gamma, and neutron source term data specific to Rocky Flats-generated waste forms stored at the INEL are provided to assist in facility design specification.

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ACRONYMS

ACL	Analytical Chemical Laboratories
ALLMW	Alpha low-level mixed waste
ALLW	Alpha low-level waste; also referred to as a-LLW
ANL	Argonne National Laboratory
ANL-W	Argonne National Laboratory West
CH	Contact-handled
CWS	Chemical Warfare Service
D&D	Decontamination and Decommissioning
DDW	Decontamination and Decommissioning Waste
DOE	United States Department of Energy
EDF	Engineering Design File
EDTA	Ethylenediaminetetraacetic acid
ENSDF	Evaluated Nuclear Structure Data File
EPA	United States Environmental Protection Agency
EWR	Early waste retrieval
FFCA	Federal Facility Compliance Act
FRP	Fiberglass-reinforced polyester
HEDL	Hanford Engineering and Development Laboratory
HEPA	High-efficiency particulate air
HLW	High-level waste
HS Pu	Heat-Source Plutonium
ICPP	Idaho Chemical Processing Plant
ILTSF	Intermediate-Level Transuranic Storage Facility

IMWI	Idaho Mixed Waste Information (database)
IMWIR	Interim Mixed Waste Inventory Report (FFCA)
INEL	Idaho National Engineering Laboratory
LLMW	Low-level mixed waste
LLW	Low-level waste
LSA	Low specific activity <100 nCi/g
MIBK	Methyl-isobutyl ketone
NDA	Nondestructive assay
NWCF	New Waste Calcining Facility
PAN	Passive-active neutron (assay system)
PCBs	Polychlorinated biphenyls
PE	Polyethylene
PTFE	Teflon
PVC	Polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RFP	Request for Proposal
RFP	Rocky Flats Plant
RGW	Research-generated waste
RH	Remote-handled
Rn	Radon
RPCs	Residue process containers
SWBs	Standard waste boxes
SWEPP	Stored Waste Examination Pilot Plant
TRAMPAC	Transuranic package transporter-II authorized methods for payload control

TRU	Transuranium radionuclide
TRUMW	Transuranic mixed waste
TRUW	Transuranic waste
TSA	Transuranic Storage Area
TWDB	Transuranic Waste Database
U.S. EPA	United States Environmental Protection Agency
WAC	Waste acceptance criteria
WG Pu	Weapons-Grade Plutonium
WIPP	Waste Isolation Pilot Plant
WIPP-WAC	Waste Isolation Pilot Plant Waste Acceptance Criteria

Radiological, Physical, and Chemical Characterization of Low-Level Alpha Contaminated Wastes Stored at the Idaho National Engineering Laboratory

1. INTRODUCTION

This document provides physical, chemical and radiological descriptive information for the alpha low-level mixed waste (ALLMW) and alpha low-level waste (ALLW) stored at the Idaho National Engineering Laboratory (INEL) and considered for treatment under the Private Sector Participation Initiative (PSPI) program by the U.S. Department of Energy (DOE). A companion document, "Radiological, Physical, and Chemical Characterization of Transuranic Wastes Stored at the Idaho National Engineering Laboratory,"¹⁻¹ provides similar information for the transuranic mixed waste (TRUMW) and transuranic (TRUW) stored at the INEL and considered for treatment by PSPI. The format and contents of each of these documents have been designed to provide treatment vendors with preliminary information concerning the characteristics and properties of the INEL stored wastes. For further information concerning treatment of wastes under the PSPI program, the reader is referred to the document *Statement of Work for a Feasibility Study on Treatment Services for Alpha-Contaminated Mixed Low-Level Waste*, dated December 15, 1993.¹⁻²

For the purposes of this report, the term *alpha low-level waste* refers to low-level waste containing, at the time of assay, less than 100 nCi/g of alpha-emitting transuranium radionuclides with half-lives greater than 20 years per gram of waste. The term *hazardous waste* refers to waste defined as hazardous according to the Resource Conservation and Recovery Act (RCRA).¹⁻³ Definitions for other terms used throughout this document are provided later in this section.

This report is divided into eight sections. In addition to this Introduction, Section 1 also contains definitions of the waste terms frequently used throughout this document. A general background of the types of waste data and reporting format for these data is also included. Section 2 focuses on the radiological characterization of the waste, and presents alpha, electron, photon, and neutron data pertinent to the INEL stored wastes. Summarized in Section 3 are the format and contents of the INEL Waste Profile Sheets for the ALLMW and ALLW. Each INEL Waste Profile Sheet consists of text, charts and tables of waste descriptive information for a particular Content Code of INEL stored waste. (A description of how waste is categorized is provided in Section 1.3). Section 4 contains the INEL Waste Profile Sheets for the ALLMW, while Section 5 contains the INEL Waste Profile Sheets for the ALLW. Section 6 contains INEL waste profile sheets presently categorized as TRUMW or TRUW but which may be ALLMW or ALLW. A cross-reference of the Content Code Number and report page number for that particular INEL Waste Profile Sheet is provided in Section 7. References are listed at the end of each section, and are numbered to conform to the format in the profile sheet databases. References for information provided throughout this report are contained in Section 8.

1.1 Definitions

For the purposes of this document, the following definitions apply and are consistent with DOE Order 5820.2A.¹⁻⁴

Alpha Low-Level Waste (ALLW). Low-level waste containing, at the time of assay, less than 100 nCi/g of alpha-emitting transuranium radionuclides with half-lives greater than 20 years per gram of waste. The acronym a-LLW is also used to designate alpha low-level waste.

Alpha Low-Level Mixed Waste (ALLMW). Alpha low-level waste also containing hazardous constituents as defined by the Resource Conservation and Recovery Act.

Contact-Handled Transuranic Waste (CH). Packaged transuranic waste whose external surface dose rate does not exceed 200 mrem per hour.

Remote-Handled Transuranic Waste (RH). Packaged transuranic waste whose external surface dose rate exceeds 200 mrem per hour. Test specimens of fissionable material irradiated for research and development purposes only and not for the production of power or plutonium may be classified as remote-handled transuranic waste.

Hazardous Waste. Those wastes that are designated hazardous by EPA regulations in accordance with 40 CFR 261.¹⁻⁵

High-Level Waste (HLW). The highly-radioactive waste material that results from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing any solid waste derived from the liquid that contains a combination of transuranic waste and fission products in concentrations requiring permanent isolation. This definition is derived from 10 CFR 60.2¹⁻⁶ which states, "High-level radioactive waste or HLW means: (1) irradiated reactor fuel, (2) liquid wastes resulting from the operation of the first cycle solvent extraction system, or equivalent, and the concentrated wastes from subsequent extraction cycles, or equivalent, in a facility for reprocessing irradiated reactor fuel, and (3) solids into which such liquid wastes have been converted."

Low-Level Waste (LLW). Waste that contains radioactivity and is not classified as high-level waste, transuranic waste, or spent fuel or 11e(2) byproduct material as defined by DOE Order 5820.2A. Test specimens of fissionable material irradiated only for research and development, and not for the production of power or plutonium, may be classified as low-level waste provided the concentration of transuranic is less than 100 nCi/g of waste.

Low-Level Mixed Waste (LLMW). Low-level waste also containing hazardous constituents as defined by the Resource Conservation and Recovery Act.

Mixed Waste. Waste containing both radioactive and hazardous components as defined by the Atomic Energy Act and the Resource Conservation and Recovery Act, respectively.

Package. The packaging, together with its radioactive contents, as presented for transport. (10 CFR 71.4¹⁻⁶/49 CFR 173.403¹⁻⁷).

Packaging. The assembly of components necessary to ensure compliance with packaging requirements of 49 CFR Subpart 1.¹⁻⁷ It may consist of one or more receptacles, absorbent materials, spacing structures, thermal insulation, radiation shielding, and devices for cooling or absorbing mechanical shock. The conveyance, tie-down system, and auxiliary equipment may sometimes be designated as part of the packaging. (10 CFR 71.4¹⁻⁶/49 CFR 173.403¹⁻⁷).

Radioactive Waste. Solid, liquid, or gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954, as amended, and of negligible economic value considering costs of recovery.

Transuranic Waste (TRUW). Without regard to source or form, waste that is contaminated with alpha-emitting transuranium radionuclides with half-lives greater than twenty years and concentrations greater than 100 nCi/g of waste at the time of assay.

Transuranic Mixed Waste (TRUMW). Transuranic waste also containing hazardous constituents as defined by the Resource Conservation and Recovery Act.

Transuranium Radionuclide (TRU). Any radionuclide having an atomic number greater than ninety-two.

Waste Container. Any receptacle (i.e., drums, boxes, bins) used to contain radioactive waste.

1.2 Background

Data describing wastes stored at the INEL and other DOE facilities have been reported in several documents and databases. These have often been developed in response to regulatory reporting requirements such as those under the Federal Facility Compliance Act¹⁻⁸ and the Land Disposal Restriction Case-by-Case Extension requirements.¹⁻⁹ While informative in providing general physical and chemical descriptive data, these systems often lack substantive information on the radiological properties of the wastes. An objective of the PSPI program is to provide descriptive data necessary for safe, efficient and economical treatment of the INEL stored wastes. For this reason, data contained in this report address radiological properties of these wastes, in addition to physical and chemical waste characteristics, and are arranged to provide as much information as possible to potential treatment vendors.

Included in radiological data for these wastes is the penetrating radiation source term for those radionuclide parents and progeny at 15 years post purification which is typical of the INEL stored waste. These parent radionuclides are ²⁵²Cf, ²⁴³Am, ²⁴¹Am, ²⁴²Pu, ²⁴¹Pu, ²⁴⁰Pu, ²³⁹Pu, ²³⁸Pu, ²³⁶Pu, ²³⁷Np, Weapons-Grade Plutonium (WG Pu), Heat-Source Plutonium (HS Pu), ²³⁸U, ²³⁵U, ²³³U, ²³²Th, ²³⁰Th, and ²²⁶Ra. (It should be noted that WG Pu is often referred to as Pu-52, and HS Pu as Pu-83, in several DOE documents and databases.) The penetrating radiation of concern in facility design is due to the gamma and neutron component of the radionuclides present in the waste. The intensity of the penetrating radiation will dictate facility

shielding design considerations. Facility shielding design criteria are primarily based on personnel exposure control regulations. Therefore, the TRU source term data provided in this document allow design decisions to be made to ensure compliance with regulations and personnel protection requirements.

Alpha radiation is nonpenetrating and constitutes an internal exposure hazard as well as an environmental hazard, and therefore alpha radiation must be considered in treatment facility design. Alpha radiation data are also provided in this document.

In general, beta radiation is not penetrating; however, care must be exercised in the type of shielding used around beta to avoid the production of secondary radiation. Although there are beta emitters in the INEL TRU waste (i.e., ^{241}Pu), the mass of these radionuclides relative to the mass of the source material (i.e., WG Pu) is very small. For example, the mass percent of the beta emitter ^{241}Pu in weapons-grade plutonium is 0.3 at purification date. Furthermore, the half-life of ^{241}Pu is 14.5 years, which means a significant fraction (i.e., over 50%) has already decayed for the "typical 15-year drum." All other beta emitters, whether TRU parent or daughter, are orders of magnitude less in mass than ^{241}Pu , and few have half-lives comparable to ^{241}Pu , with the majority having half-lives less than one day. Therefore, the beta activity associated with these radionuclides does not appear to be a major consideration for personnel or environmental exposure control. The parent/progeny beta source term data, however, are provided in this document for vendor evaluation.

Reference documents for most of the radiological data contained in this report are a series of Engineering Design Files (EDFs) prepared by the authors of this report for the PSPI program. Identification of these EDFs and a brief description of their contents are provided below. References for data not included in these EDFs are noted throughout this document.

Radioactivity decay/growth computations used to determine the alpha activity due to one gram of parent source material at 15 years post purification date are provided in *Alpha Activity Distribution Due to Selected TRU and non-TRU Source Materials at 15 Years Post Purification Date* by Becker.¹⁻¹⁰ Included in this EDF are (1) mass composition of weapons-grade plutonium and heat-source plutonium; (2) the alpha activity (TRU and non-TRU) due to one gram of TRU parent source material (^{252}Cf , ^{243}Am , ^{241}Am , ^{242}Pu , ^{241}Pu , ^{240}Pu , ^{239}Pu , ^{238}Pu , ^{236}Pu , ^{237}Np , WG Pu and HS Pu) at 15 years post purification (see Table 2-1); and (3) the alpha activity (TRU and non-TRU) due to one gram of non-TRU parent source material (^{238}U , ^{235}U , ^{233}U , ^{232}Th , ^{230}Th , and ^{226}Ra) at 15 years post purification.

The computer programs, computations and resulting information used to determine the transuranic alpha activity concentration data provided in this report are documented in *Radionuclide and Alpha Activity Concentration Data for the INEL Stored Wastes Reported in the Transuranic Waste Database (TWDB)*, by Frasure and Apel.¹⁻¹¹ The TWDB¹⁻¹² is one of several INEL databases containing descriptive information about the INEL stored wastes. This database was used primarily in this effort since, at the time of this research, the TWDB contained the most complete and detailed information concerning the radionuclide inventory of the INEL waste.

The development and configuration of a database containing data from approximately 13,000 measurements made with the Stored Waste Examination Pilot Plant (SWEPP)

Passive-Active Neutron (PAN) Assay System is documented by East in *SWEPP Passive-Active Neutron Assay Database Description*.¹⁻¹³ The PAN system is used to obtain nondestructive assay (NDA) measurements to determine the fissile content of 55-gallon waste drums. To date this system has been used at the INEL to exclusively measure plutonium-contaminated waste from the DOE Rocky Flats facility. This database was developed to obtain the neutron source term data for the wastes under consideration by PSPI. This database was established using the Microsoft Access software package.¹⁻¹⁴

The EDF, *Neutron Source Terms for Rocky Flats Generated Waste at the INEL*, by East¹⁻¹⁵ provides a discussion of the origin of neutrons emitted from TRU waste. Estimates of neutron yields are provided for various isotopes and chemical forms. Included in this EDF are (1) neutron yields for plutonium isotopes and ²⁴¹Am; (2) neutron yields per gram of plutonium for some representative isotopic compositions and chemical forms; (3) neutron yields for uranium isotopes and for other nuclides; and (4) average waste neutron emission rates for select content codes.

Source term data for photons and electrons due to select TRU and non-TRU radionuclides associated with alpha low-level waste and transuranic wastes are provided by Becker in *Low-Level Alpha-Contaminated and Transuranic Waste Photon/Electron Source Term Data*.¹⁻¹⁶ Included in this EDF are (1) total electron yield per gram parent material for select radionuclides and plutonium mixtures (²⁵²Cf, ²⁴³Am, ²⁴¹Am, ²⁴²Pu, ²⁴¹Pu, ²⁴⁰Pu, ²³⁹Pu, ²³⁸Pu, ²³⁶Pu, ²³⁷Np, WG Pu, HS Pu, ²³⁸U, ²³⁵U, ²³³U, ²³²Th, ²³⁰Th, and ²²⁶Ra) at 15 years post purification; and (2) gamma spectrum data in both tabular and graph form for each of the above referenced materials.

Hazardous constituents present in the waste are identified in *Preliminary EPA Hazardous Constituents Design Basis Concentrations for a-LLW Treatment Services* by Raivo and Pace.¹⁻¹⁷ This document also provides design basis concentration information for the identified hazardous constituents. The EDF, *Estimated Waste Matrix Compositions of ALLW for Treatment Design Basis*, by Gale¹⁻¹⁸ provides information concerning bulk waste properties. Waste composition information describing nonhazardous materials present in the waste (i.e., concrete, structural steel, etc.) and their associated chemistry are provided.

1.3 Waste Categorization

Each container (drum, box, bin, etc.) of waste stored at the INEL is categorized under a specific content code which provides a general description of the containerized material. For each content code there is an assigned content code number and name. Similar content codes are further categorized under a common waste stream name and associated number. For example, the following content codes

Content Code 300: Graphite
Content Code 301: Graphite Cores

are categorized under the waste stream

ID-EGG-137: Nonmetal Molds and Crucibles (ALLW).

Waste descriptive information and physical, chemical and radiological data contained in this report are provided in accordance with this content code and waste stream classification system currently in place at the INEL. Table 1-1 contains a listing of the content code numbers and names for ALLWs and ALLMWs for which information is provided in this document.

It should be noted that much of the categorization system presently used at the INEL and other DOE facilities originated several years before treatment of these wastes was strongly considered. Current methods of waste identification, characterization, documentation, and auditing were not in place at the time the majority of these wastes were generated and placed in storage. One only has to recall that the identification of *hazardous wastes* came about with the authorization of RCRA and its subsequent implementation over the past twenty years to understand why it is not readily apparent from historical records which of these wastes are mixed wastes, or solely radioactive wastes. National security provisions and practices over the past several decades have further prevented more accurate waste characterization data and knowledge about these materials.

Provided in this report are data presently available at the INEL concerning these wastes. Until further characterization of these materials is undertaken, it is likely that the extent of error in these data, or their overall accuracy and completeness, will not be fully known. Therefore, caution should be exercised in the use and interpretation of data contained in this report, as well as other documents concerning these wastes.

Alpha low-level wastes stored at the INEL are tracked in a minimum of three INEL databases. The Radioactive Waste Management Information System (RWMIS) is thought to accurately represent the total quantity of waste in storage. However, it is missing content codes for many shipments, making it difficult to assign containers to a waste stream or content code. The Transuranic Waste Database (TWDB) provides radiological, container, storage, and other waste descriptive data on a container level. The TWDB, however, is thought to be missing approximately 20% of the total wastes. The Idaho Mixed Waste Information (IMWI) database was recently developed at the INEL to address the Interim Mixed Waste Inventory Report for the FFCA.¹⁻¹⁹ The IMWI is thought to contain more complete storage data, but does not provide radiological characterization data.

The data contained in the INEL Waste Profile Sheets in this report utilize pertinent information from each of these databases. Inventory and container storage data were primarily obtained from IMWI. Radionuclide and associated waste mass data were obtained from TWDB and RWMIS. Inconsistencies in INEL waste information were resolved to the extent possible by INEL personnel knowledgeable in waste properties and characteristics. As noted earlier, caution should be exercised in interpretation of these data.

Table 1-1. Content code numbers and names for ALLMW and ALLW.

Content code number	Content code name
0	Not recorded-unknown
1	First-stage sludge
2	Second-stage sludge
3	Organic setups, oil solids
4	Special setups (cement)
5	Evaporator salts
7	Building 374 dry sludge
10	Combustibles
12	Miscellaneous sources
20	Noncompressible, noncombustible
30	Solidified grinding sludge, etc.
40	Solid binary scrap powder, etc.
81	Met samples fissile
90	Dirt
95	Sludge ^a
100	General plant waste
101	Cut-up gloveboxes
102	Absorbed liquids
104	Alpha hot cell waste
111	WIPP precertified, RGW noncompactible solids or certified solids wet sludge
112	Solid organics
113	Certified solid lab waste
114	Certified solid inorganic process solution
115	Certified TRU graphite waste
116	Certified TRU combustible waste
117	Certified TRU metal waste
118	Certified TRU glass waste
119	Certified TRU HEPA filter waste
121	WIPP precertified DDW noncombustible solids
122	Certified TRU inorganic solid waste
123	Certified TRU leaded rubber
150	Laboratory waste
153	Combustible lab waste
154	Sample fuel
155	TRU scrap

Table 1-1. (continued).

Content code number	Content code name
156	Chem cell rip-out
161	ANL-W ACL glassware, paper, poly, and miscellaneous hardware
201	Noncombustible solids
202	Combustible solids
203	Paper, metals, glass
204	Solidified solutions
241	Americium process residue
292	Cemented sludge
300	Graphite
301	Graphite cores
302	Benelex and Plexiglas ^b
310	Graphite scarfings
320	Tantalum
328	Fulflo incinerator filters
330	Dry paper and rags
335	Absolute 8 × 8 filters
336	Moist paper and rags
337	Plastics, Teflon, wash, PVC
338	Insulation and CWS filter media
339	Leaded rubber gloves and aprons ^c
360	Insulation
370	Crucible, LECO
371	Firebrick
372	Grit
374	Blacktop, concrete, dirt and sand
375	Oil-Dri residue from incinerator
376	Cemented insulation/filter media
425	Fluid bed ash
430	Unleached iron column resin
431	Leached resin
432	Leached and cemented resin
440	Glass
441	Unleached Raschig rings
442	Leached Raschig rings
463	Leaded rubber gloves and aprons ^c

Table 1-1. (continued).

Content code number	Content code name
464	Benelex and Plexiglas ^b
480	Nonspecial source metal
481	Leached nonspecial source metal
490	CWS filters
803	Metal, equipment, pipes, valves, etc.
824	Noncombustible equipment boxes
825	Noncombustible equipment drums
826	Combustible equipment boxes or floor sweepings and rust
834	High-level acid
835	High-level caustic
836	High-level sludge/cement
838	<10 nCi/g noncombustible
842	Contaminated soil
847	LSA <100 nCi/g combustible
848	LSA <100 nCi/g noncombustible
900	LSA plastics, paper, etc.
950	LSA metal, glass, etc.
960	Concrete, asphalt, etc.
970	Wood
976	Building 776 process sludge
978	Laundry sludge
990	Dirt
995	Sludge ^a
9999	Pre-73 drums

a. Although content codes 95 and 995 have the same name, content code 995 also contains a limited number of drums of sludge generated by plutonium recovery operations.

b. Content code 302 was replaced by content code 464 in 1973.

c. Content code 339 was replaced by content code 463 in 1973.

1.4 References

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- 1-2. *Statement of Work for a Feasibility Study on Treatment Services for Alpha-Contaminated Mixed Low-Level Waste*, Idaho National Engineering Laboratory, DOE-ID RFP No. DE-RP07-94ID13278, December 15, 1993.
- 1-3. Resource Conservation and Recovery Act of 1976, as amended, (Public Law 94-580).
- 1-4. U.S. Department of Energy Order 5820.2A, "Radioactive Waste Management," Office of Defense Waste and Transportation Management, U.S. Department of Energy, Washington, D.C., September 26, 1988.
- 1-5. Code of Federal Regulations, Title 40, "Protection of the Environment," Office of the Federal Register National Archives and Records Administration, July 1, 1991.
- 1-6. Code of Federal Regulations, Title 10, "Energy," Office of the Federal Register National Archives and Records Administration, January 1, 1993.
- 1-7. Code of Federal Regulations, Title 49, "Transportation," Office of the Federal Register National Archives and Records Administration, October 1, 1992.
- 1-8. Federal Facility Compliance Act of 1992, as amended, (Public Law 102-386).
- 1-9. U.S. Department of Energy, *Land Disposal Restriction Case-by-Case Extension Application for Radioactive Mixed Wastes*, as submitted to the U.S. Environmental Protection Agency, October 1991.
- 1-10. Becker, G. K., (*RWMC EDF 629—Rev. 1*), *Alpha Activity Distribution Due to Selected TRU and non-TRU Source Materials at 15 Years Post Purification Date*, RWMC EDF-690, December 2, 1993.
- 1-11. Frasure, J. and M. L. Apel, *Radionuclide and Alpha Activity Concentration Data for the INEL Stored Waste Reported in the Transuranic Waste Database (TWDB)*, RWMC EDF-716, March 4, 1994.
- 1-12. Transuranic Waste Database (TWDB), Idaho National Engineering Laboratory, Idaho Falls, Idaho, February 1994.
- 1-13. East, L. V., *SWEPP Passive-Active Neutron Assay Database Description*, RWMC EDF-688, December 13, 1993.

- 1-14. *Microsoft Access User's Guide*, Microsoft Corporation, Document No. DB26141-1092, 1992.
- 1-15. East, L. V., *Neutron Source Terms for Rocky Flats Generated Waste at the INEL*, RWMC EDF-694, January 7, 1994.
- 1-16. Becker, G. K., *Low-Level Alpha Contaminated and Transuranic Waste Photon/Electron Source Term Data*, RWMC EDF-669, January 10, 1994.
- 1-17. Raivo, B. D. and D. P. Pace, *Preliminary EPA Hazardous Constituents Design Basis Concentrations for a-LLW Treatment Services*, EDF PSPI-015546-04, January 18, 1994.
- 1-18. Gale, L. J., *Estimated Waste Matrix Compositions of ALLW for Treatment Design Basis*, EDF IWPF-0047, February 1994.
- 1-19. U.S. Department of Energy, *Idaho National Engineering Laboratory Conceptual Site Treatment Plan*, DOE/ID-10453, October 1993.

2. RADIOLOGICAL CHARACTERIZATION OF THE WASTE

The design of a treatment facility for processing alpha low-level waste must include provisions to ensure personnel and environmental protection against radiological hazards. Such design considerations are dependent upon the proper characterization of the photon, electron, alpha, and neutron source terms associated with the alpha low-level waste. Alpha low-level radioactive constituents are comprised of radionuclides typical of transuranic materials. The difference between ALLW and TRUW is the alpha activity concentration of the TRU source material entrained within the waste matrix, nCi-TRU/g-waste. The waste alpha activity concentration segregation point is 100 nCi-alpha activity/g-waste. Waste forms with an alpha activity concentration less than the specified 100 nCi/g are categorized as ALLW.

The ALLW source term data are developed and illustrated for INEL retrievably-stored waste containers generated as a byproduct of operations at the Rocky Flats Plant (RFP). Such data are applicable to the majority of the retrievably-stored waste container population as the RFP fraction constitutes approximately 95% by volume. The balance of the retrievably-stored waste container population is from generators such as Mound Laboratory, Battelle Columbus Laboratories, and the Bettis Atomic Power Laboratory. Source term data associated with these generator wastes are addressed in this document. Due to the present unavailability of process source composition data and neutron yield data for the non-RFP wastes, data for these wastes are not as complete as that for the RFP wastes. Nevertheless, the data provided in this report can be used to support initial waste treatment feasibility studies. It should be recognized, however, that the source characteristics of non-RFP wastes need to be satisfactorily established and evaluated prior to processing.

The RFP alpha, electron, and photon source term data are prepared from established nuclear constants and related databases. To provide for consistency in the derivation of alpha, electron, and photon source terms, the same fundamental assumptions are applied. These assumptions are as follows:

- Rocky Flats Plant source term is due to the radionuclides and radionuclidic compounds as specified in Table 2-1
- Nominal isotopic composition of the two radionuclidic compounds (WG Pu and HS Pu) specified in Table 2-1 is as per Table 2-2²⁻¹
- Source characterization data accounts for and includes the parent and all progeny excluding radon isotopes at a 15-year post purification date
- 15 year decay/ingrowth time is a representative average waste age for the retrievably-stored waste at the RWMC
- Source self-absorption effects associated with the photon, electron, and alpha data are not accounted for; the specified source term data is simply the theoretical yield.

The RFP neutron source characterization data cannot be directly calculated from the use of nuclear data and a specified set of parent radionuclides and parent radionuclidic compounds. This

Table 2-1. Radionuclides and plutonium compounds for which data are reported.

^{252}Cf	^{239}Pu	^{238}U
^{243}Am	^{238}Pu	^{235}U
^{241}Am	^{236}Pu	^{233}U
^{242}Pu	^{237}Np	^{232}Th
^{241}Pu	WG Pu	^{230}Th
^{240}Pu	HS Pu	^{226}Ra

Table 2-2. Nominal isotopic composition of plutonium compounds.

Isotopic composition of weapons grade plutonium: WG Pu		Isotopic composition of heat source: HS Pu	
Radionuclide	Mass fraction	Radionuclide	Mass fraction
^{238}Pu	1.2E-04	^{236}Pu	1.0E-06
^{239}Pu	9.38E-01	^{238}Pu	8.35E-01
^{240}Pu	5.82E-02	^{239}Pu	1.4E-01
^{241}Pu	3.4E-03	^{240}Pu	2.0E-02
^{242}Pu	2.4E-04	^{241}Pu	4.0E-03
^{241}Am impurity	200 $\mu\text{g/g}$ WG Pu	^{242}Pu	1.0E-03

is primarily due to the variation in neutron emission rate as a function of the chemical compound and configuration of the alpha-emitting radionuclides. In spite of this complication, it is possible to bound the neutron emission rate source term based on measurements acquired at the Stored Waste Examination Pilot Plant (SWEPP) waste characterization INEL facility as a function of waste form, i.e., content code.

The source term data for alpha, electron, photon, and neutron radiations associated with the radionuclides and radionuclidic compounds of Table 2-1 are presented in the following four sections. Each section delineates the method of computation, assumptions employed, and illustrates results as appropriate.

2.1 Alpha Data

The alpha source term is specifically defined as the alpha activity due to one gram of parent source material at 15 years post purification date. The computed 15-year decay date alpha activity includes the contribution from the parent radionuclide or compound and the activity associated with all alpha-emitting progeny, i.e., daughter, granddaughter, great granddaughter, etc. in the decay chain. For each parent radionuclide or compound, the alpha activity is categorized into transuranic TRU and non-TRU components where the TRU component consists of alpha-emitting radionuclides with an atomic number greater than 92 and a half-life greater than 20 years. The non-TRU components are those alpha-emitting radionuclide species with atomic numbers of 92 or less and/or half-lives of less than 20 years. The method and results illustrated in this section are based on previous work by Becker (1993).²⁻¹

The process of determining the TRU and non-TRU alpha activity distribution starts by establishing all of the members of the radioactive series decay chain for a given parent source material. Once the various radioactive species constituting a given decay chain have been established, the parent material is assigned an initial (time equals 0) mass of 1.0 gram. The decay computation is then performed which results in a mass value for the various members of the decay chain at 15 years from time zero. Decay half-lives and appropriate branching ratios utilized in the computation for each member of the series decay chain are obtained from Browne and Firestone.²⁻² The decay/ingrowth computational method employed in the analysis is based on a parameterized form of the Bateman equations.

Since the 15 year decay/ingrowth time is relatively short compared to the half-lives of most of the parents and decay chain members addressed in this evaluation, some species will have a minimal ingrowth mass at 15 years. No criteria is set for a minimum calculated mass under which a given chain member is neglected. This is because a radionuclide may have a large specific activity such that its contribution to the 15-year alpha activity is significant despite its seemingly small mass. Thus for the sake of completeness and data integrity, the decay chain is followed all the way to the stable element chain endpoints, typically 8 to 10 generations, to ensure that all alpha activity is considered.

Having established the individual masses of the various members of the decay chain at 15 years, it is a simple matter to obtain the alpha activity for the TRU and non-TRU chain members. The alpha activity for each chain member is determined by multiplying the calculated mass in grams by the specific alpha activity (Ci/g) for that particular member to obtain alpha

activity (Ci). The alpha-emitting progeny for the decay chain are then grouped into either TRU or non-TRU categories. The total alpha activity per gram of parent source material at 15 years post purification is then determined by summing all computed decay chain member alpha activities within the TRU or non-TRU category.

For the case of the radionuclidic compounds, weapons-grade plutonium (WG Pu) and heat-source plutonium (HS Pu), the computation of the TRU and non-TRU alpha activities requires some additional accounting. For such compounds, the total alpha activity in the TRU and non-TRU categories is due to the contribution of each radionuclidic component of the parent compound and all of its alpha-emitting progeny weighted by the appropriate parent mass fraction. The nominal mass fractions utilized in the computation for the WG Pu and HS Pu alpha activity determinations are shown in Table 2-2. The WG Pu computation also includes the ^{241}Am impurity present at time zero purification date which is nominally 200 micrograms ^{241}Am per gram of WG Pu. There are no impurities included in the HS Pu alpha activity calculations.

As indicated in the assumptions set, the alpha activity due to the nuclide radon (Rn) is not included in any of the non-TRU alpha activity tabulations. The reasoning behind this exception is that while the waste is containerized it is considered sealed such that radon migration from the waste is nonexistent or minimal. Therefore, all radon progeny will become a component of the source term as they are considered to have grown in and become fixed in the waste matrix over time. When the container is opened for treatment at some date, it is then expected that the radon isotopes will migrate from the waste matrix, thus leaving behind the radon progeny radionuclides. To the extent that radon does migrate from containerized waste forms during storage, the source term will be biased toward the conservative.

Table 2-3 contains the distribution between TRU and non-TRU alpha activity for parent source material comprised of the Table 2-1 TRU radionuclides. Also included in Table 2-3 are the TRU and non-TRU alpha activity components for the two radionuclide compounds WG Pu and HS Pu. The values tabulated in Table 2-4 result from the determination of alpha activity for Table 2-1 parent source material consisting of non-TRU radionuclides only. The distinction between TRU and non-TRU in the context of Tables 2-3 and 2-4 is not to be confused with the concentration-based definition as per DOE Order 5820.2A.²⁻³

2.2 Electron Data

The electron source term data are comprised of emitted atomic electrons, internal conversion and Auger-electrons, and beta (β) radiations termed continuous radiation due to the continuous nature of the energy spectra. As with the alpha data, the mass of each member of the parent/progeny series decay chain is determined at a 15-year post purification date. The method and results described in this section are based on previous work by Becker (1994).²⁻⁴

The total atomic electron source term in units of keV/sec is computed using the total average electron energy per disintegration, $\langle e \rangle$, (keV/dis) as tabulated in the Table of Radioactive Isotopes. The value $\langle e \rangle$ is multiplied by the respective parent/progeny radionuclide decay rate, disintegrations/second, as computed at 15 years from time zero due to an initial parent/parent compound mass of one gram. This same process is followed for the continuous β radiation source by multiplying the total average β energy per disintegration $\langle \beta \rangle$, (keV/dis), by

Table 2-3. Alpha activity due to one gram of TRU parent source material at 15 years post purification.

TRU source material	TRU α activity (Ci)	Non-TRU α activity (Ci)
^{252}Cf	3.694E-03	1.0274E+01
^{243}Am	1.991E-01	5.828E-13
^{241}Am	3.3466	6.00E-10
^{242}Pu	3.926E-03	9.286E-12
^{241}Pu	1.7392	1.2058E-03
^{240}Pu	2.266E-01	1.030E-07
^{239}Pu	6.201E-02	8.288E-10
^{238}Pu	1.5205E+01	7.339E-04
^{236}Pu	1.3853E+01	8.3254E+01
^{237}Np	7.05E-04	3.0206E-08
WG Pu	7.977E-02	4.1946E-06
HS Pu	1.27171E+01	6.948E-04

Table 2-4. Alpha activity due to one gram of non-TRU parent source material at 15 years post purification.

Non-TRU source material	TRU α activity (Ci)	Non-TRU α activity (Ci)
^{238}U	—	3.36E-07
^{235}U	—	1.923E-06
^{233}U	—	9.68E-03
^{232}Th	—	2.779E-07
^{230}Th	—	2.009E-02
^{226}Ra	—	2.2426

the respective parent/progeny radionuclide activity (dis/sec) at the 15-year decay time. For those individual chain members yielding atomic electrons, internal conversion/Auger-electrons, and continuous β radiations, the total average energy per disintegration is the sum of the components. The total average electron energy emission rate for a given parent/progeny chain is obtained by summing the computed energy emission rate contributed by each member of the chain at 15 years. The radon exception noted for the alpha source term computations also applies to the electron source term.

The results of the electron source term evaluation for the list of radionuclides identified in Table 2-1 is shown in Table 2-5. The californium isotope, although listed in Table 2-1, is omitted as there are no tabulated Evaluated Nuclear Structure Data File (ENSDF) data regarding electron decay modes and the intensities of the ^{252}Cf fission products. This is of no great significance as there are only one or two drums listed in the Transuranic Waste Database (TWDB) which indicate the presence of californium. Additionally, the contribution to the electron source term from the progeny of these californium spontaneous fission decays can safely be dismissed due to the very low branching ratios.

No adjustment has been made for subsequent electron radiation interactions with either the source material itself or the waste matrix. The tabulated data is strictly the total energy emission rate per second computed as described.

2.3 Photon Data

The photon source term includes all γ -rays and x-rays associated with the parent/progeny decay chain members. The method and results presented in this report section are based on previous work by Becker (1994).²⁻⁴

The data source utilized to determine the photon source term is the Table of Radioactive Isotopes published in 1986. The data for this publication came from the ENSDF, from which the Nuclear Data Sheets are published, as they existed circa 1984. Some of the ENSDF data has been edited by the authors prior to its inclusion in the Table of Radioactive Isotopes in addition to local INEL-based edits resulting from specialized evaluations. Therefore the data file utilized in the source term calculations is an updated version of the original ENSDF data.

In order to interpret the photon source term data, it is necessary to delineate the manner in which it was derived, thereby establishing a baseline for its subsequent use. As with the alpha and electron source terms, all photon source term data is based on an initial mass of a given parent radionuclide or parent radionuclidic compound such as weapons-grade plutonium (WG Pu). The parent radionuclides and radionuclidic compounds considered in this evaluation are again as specified in Table 2-1, and the nominal radionuclidic composition of the two compounds, WG Pu and HS Pu, are shown in Table 2-2.

The photon source term is computed for each indicated parent radionuclide and/or compound at 15 years post purification. As with the alpha and electron source terms, this requires that the decay and ingrowth of all members of the parent/progeny decay chain be accounted for at 15 years from time zero, where time = 0 is the time when the parent radionuclide or radionuclide compound mass is one gram. Thus all computations yield the photon

Table 2-5. Total electron yield per gram parent material at 15 years post purification.

Radionuclide source material	Total electron energy (keV/sec)
²⁴¹ Am	3.7643E+12
²⁴³ Am	1.3057E+12
²⁵² Cf	—
²³⁷ Np	1.6687E+09
²³⁶ Pu	7.1147E+14
²³⁸ Pu	5.5795E+12
²³⁹ Pu	7.5145E+03
²⁴⁰ Pu	4.0903E+04
²⁴¹ Pu	1.1589E+13
²⁴² Pu	1.1762E+09
²²⁶ Ra	3.6877E+13
²³⁰ Th	5.1243E+09
²³² Th	3.7349E+05
²³³ U	2.0408E+09
²³⁵ U	1.7434E+07
²³⁸ U	6.3847E+06
HS Pu	4.7059E+12
WG Pu	4.0825E+10

emission rate (photons/second-energy group) due to an initial one-gram time zero mass of parent material at a 15-year decay/ingrowth date. The photons are grouped into 50 keV-wide energy bins to simplify downstream computations.

To illustrate, the radionuclide chain members which are components of the photon source specified at 15 years post purification for ^{236}Pu are: $^{236}\text{Pu} \rightarrow ^{232}\text{U} \rightarrow ^{228}\text{Th} \rightarrow ^{224}\text{Ra} \rightarrow ^{220}\text{Rn} \rightarrow ^{216}\text{Po} \rightarrow ^{212}\text{Pb} \rightarrow :: ^{212}\text{Bi} \rightarrow (\alpha = 0.3594) ^{208}\text{Tl} \rightarrow ^{208}\text{Pb} :: ^{212}\text{Bi} \rightarrow (\beta = 0.6406) ^{212}\text{Po} \rightarrow ^{208}\text{Pb}$. The mass of each radionuclide in the chain is determined at 15 years and the photon yield associated with that mass is summed together to obtain the total photon source term for the parent/progeny source again at 15 years.

As indicated in the alpha and electron source term sections, an exception to this method involves the isotopes of the radon nuclide. Photons associated with the radon isotopes as they occur in any decay chain are eliminated from the total summed photon yield for a given parent, and therefore such contribution is not included in the tabular and spectral data. Additionally, it is to be noted that there are several radionuclides that have spontaneous fission branches. Since a spontaneous fission event leads to many different daughter nuclides, the associated γ -ray yield will be very weak and therefore has not been included in the source term. The branch intensities of the Table 2-1 nuclides having spontaneous fission branches identified in the Table of Radioactive Isotopes are: ^{233}U ($1.3 \times 10^{-10}\%$), ^{238}Pu ($1.84 \times 10^{-7}\%$), ^{239}Pu ($4.4 \times 10^{-10}\%$), ^{241}Am ($4.1 \times 10^{-10}\%$), ^{242}Pu ($5.5 \times 10^{-4}\%$), and ^{243}Am ($2.2 \times 10^{-8}\%$). The contribution to the source term from the progeny of these spontaneous fission decays can safely be neglected due to the very low branching ratios. This is also effectively the case for the ^{252}Cf nuclide. There are no tabulated ^{252}Cf ENSDF data regarding the specific γ -rays and intensities of the daughters, and it therefore has not been evaluated relative to a photon source term. This is of no great significance as there are only one or two drums listed in the TWDB database which indicate the presence of californium.

The photon source term specified for each parent/progeny chain includes all γ -rays in addition to x-rays arising from vacancies created in the K and L_1 atomic shells by internal conversion and electron-capture processes. The data have been processed into 50 keV energy bins to reduce the complexity of subsequent shielding calculations while maintaining the integrity of the final computations. In regard to the interpretation of the shielding calculation results, the source term does not include any consideration of source self-absorption or, for that matter, waste matrix attenuation effects. This is primarily due to the fact that no valid uniformly-applicable information is available as to the source configuration and distribution within the waste matrix. Thus the source term data as presented is purely the theoretical photon yield from the parent/progeny source of interest at 15 years post purification. The subsequent data evaluator can apply corrections based on assumptions deemed reasonable or applicable for the case under study.

The results of the photon source term computations are shown in tabular form in Tables 2-6 through 2-22. The data are in units of photons per second per 50 KeV energy bin per gram parent/parent compound at 15 years from time zero or post purification. Each energy bin is represented in the tabular data by the bin energy midpoint in units of keV. For example, the energy bin spanning the 0-to-50 keV range is represented as the 25 keV bin, etc. The respective data is plotted in histogram form in Figures 2-1 through 2-17 with an ordinate scale of log base 10. The plotted data represent the number of photons per second per 50 keV interval at a

**Table 2-6. Tabular Data for Gamma Spectrum of
Am-241 Parent at 15 Years Post Purification
(AM-241 Mass - 1.0 Gram at $t = 0$)**

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g
25	5.21E+10	675	5.46E+05
75	4.45E+10	725	2.55E+05
125	3.49E+07	775	2.83E+04
175	5.15E+05	825	3.37E+03
225	1.13E+06	875	2.70E+03
275	1.45E+05	925	1.01E+03
325	1.10E+06	975	7.20E+02
375	5.65E+05	1,025	1.68E-06
425	8.62E+04	1,075	0.00E+00
475	2.43E+04	1,125	1.68E-06
525	1.04E+05		
575	1.60E+04		
625	8.40E+04		

**Figure 2-1. Gamma Spectrum of Am-241 Parent at
15 Years Post Purification
(AM-241 Mass - 1.0 Gram at $t = 0$)**

**Table 2-7. Tabular Data for Gamma Spectrum of
Am-243 Parent at 15 Years Post Purification
(Am-243 Mass - 1.0 Gram at t = 0)**

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g
25	4.63E+09	575	7.48E-02
75	6.30E+09	625	2.42E+04
125	4.75E+09	675	6.99E+04
175	7.48E+06	725	2.73E-01
225	1.12E+09	775	5.02E-01
275	1.15E+09	825	2.15E-02
325	2.76E+08	875	4.09E-03
375	1.16E+05	925	1.36E-03
425	1.28E+06	975	3.69E-03
475	1.28E+06	1,025	3.87E-04
525	1.09E+05	1,075	1.45E-03

**Figure 2-2. Gamma Spectrum of Am-243 Parent at
15 Years Post Purification
(Am-243 Mass - 1.0 Gram at t = 0)**

**Table 2-8. Tabular Data for Gamma Spectrum of
Np-237 Parent at 15 Years Post Purification
(Np-237 Mass - 1.0 Gram at t = 0)**

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g
25	1.76E+07	675	5.16E-05
75	6.23E+00	725	4.73E-05
125	5.63E+05	775	0.00E+00
175	2.23E+05	825	0.00E+00
225	8.77E+04	875	3.57E-05
275	3.92E+03	925	0.00E+00
325	2.12E-01	975	0.00E+00
375	1.81E-02	1,025	1.42E-04
425	6.61E-04	1,075	0.00E+00
475	2.43E-03	1,125	1.42E-04
525	3.73E-04	1,175	0.00E+00
575	1.51E-04		
625	3.96E-05		

**Figure 2-3. Gamma Spectrum of Np-237 Parent at
15 Years Post Purification
(Np-237 Mass - 1.0 Gram at t = 0)**

**Table 2-9. Tabular Data for Gamma Spectrum of
Pu-236 Parent at 15 Years Post Purification
(Pu-236 Mass - 1.0 Gram at t = 0)**

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g
25	2.49E+11	925	3.66E+08	1.625	9.22E+08
75	3.16E+11	975	1.32E+08	1.675	0.00E+00
125	6.08E+09	1.025	0.00E+00	1.925	0.00E+00
175	1.17E+09	1.075	8.68E+08	1.975	0.00E+00
225	3.68E+11	1.125	0.00E+00	2.025	0.00E+00
275	2.04E+10	1.175	7.89E+07	2.075	0.00E+00
325	2.80E+10	1.225	0.00E+00	2.125	0.00E+00
375	0.00E+00	1.275	1.47E+08	2.175	0.00E+00
425	8.31E+07	1.325	0.00E+00	2.225	0.00E+00
475	1.41E+08	1.375	1.97E+07	2.275	0.00E+00
525	6.43E+10	1.425	0.00E+00	2.325	0.00E+00
575	1.24E+10	1.475	0.00E+00	2.375	0.00E+00
625	2.23E+07	1.525	2.54E+08	2.425	0.00E+00
675	1.01E+08	1.575	0.00E+00	2.475	0.00E+00
725	8.20E+10	1.625	1.14E+10	2.525	0.00E+00
775	1.38E+10	1.675	6.18E+08	2.575	0.00E+00
825	1.13E+08	1.725	5.63E+08	2.625	2.93E+11
875	3.81E+10	1.775	0.00E+00	2.650	0.00E+00

**Figure 2-4. Gamma Spectrum of Pu-236 Parent at
15 Years Post Purification
(Pu-236 Mass - 1.0 Gram at t = 0)**

**Table 2-10. Tabular Data for Gamma Spectrum of
Pu-238 Parent at 15 Years Post Purification
(PU-238 Mass - 1.0 Gram at t = 0)**

Bln Midpoint keV	Gamma Emission photons/sec-g	Bln Midpoint keV	Gamma Emission photons/sec-g
25	6.13E+10	625	2.17E-01
75	4.26E+07	675	2.71E-01
125	3.62E+05	725	4.67E+04
175	5.28E+06	775	2.12E+05
225	2.32E+04	825	6.95E+03
275	1.40E+03	875	1.89E+04
325	0.00E+00	925	9.59E+03
375	0.00E+00	975	4.50E+02
425	2.74E-05	1,025	9.33E+03
475	6.78E+00	1,075	5.93E+02
525	4.40E+00	1,125	0.00E+00
575	3.25E+00		

**Figure 2-5. Gamma Spectrum of Pu-238 Parent at
15 Years Post Purification
(Pu-238 Mass - 1.0 Gram at t = 0)**

**Table 2-11. Tabular Data for Gamma Spectrum of
Pu-239 Parent at 15 Years Post Purification
(Pu-239 Mass - 1.0 Gram at $t = 0$)**

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g
25	2.70E+05	575	5.32E+01
75	9.30E+05	625	7.93E+02
125	2.57E+05	675	5.03E+02
175	1.21E+04	725	1.94E+02
225	1.48E+04	775	3.57E+02
275	3.72E+03	825	1.53E+01
325	3.33E+04	875	2.91E+00
375	6.58E+04	925	9.64E-01
425	3.75E+04	975	2.62E+00
475	4.57E+03	1,025	2.75E-01
525	6.89E+00	1,075	1.03E+00

**Figure 2-6. Gamma Spectrum of Pu-239 Parent at
15 Years Post Purification
(Pu-239 Mass - 1.0 Gram at $t = 0$)**

**Table 2-12. Tabular Data for Gamma Spectrum of
Pu-240 Parent at 15 Years Post Purification
(Pu-240 Mass - 1.0 Gram at t = 0)**

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g
25	3.74E+06	525	1.18E+01
75	5.95E+03	575	0.00E+00
125	6.03E+05	625	1.03E+03
175	3.37E+04	675	2.85E+02
225	2.27E+03	725	0.00E+00
275	0.00E+00	775	0.00E+00
325	0.00E+00	825	0.00E+00
375	0.00E+00	875	4.69E+01
425	0.00E+00	925	0.00E+00
475	0.00E+00		

**Figure 2-7. Gamma Spectrum of Pu-240 Parent at
15 Years Post Purification
(Pu-240 Mass - 1.0 Gram at t = 0)**

**Table 2-13. Tabular Data for Gamma Spectrum of
Pu-241 Parent at 15 Years Post Purification
(Pu-241 Mass - 1.0 Gram at t = 0)**

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g
25	2.71E+10	675	2.84E+05
75	2.32E+10	725	1.32E+05
125	4.52E+07	775	1.47E+04
175	1.24E+06	825	1.75E+03
225	1.04E+07	875	1.41E+03
275	4.07E+05	925	5.23E+02
325	1.15E+06	975	0.00E+00
375	3.59E+05	1,025	3.39E-07
425	4.18E+04	1,075	0.00E+00
475	1.26E+04	1,125	3.39E-07
525	5.43E+04		
575	8.32E+03		
625	4.36E+04		

**Figure 2-8. Gamma Spectrum of Pu-241 Parent at
15 Years Post Purification
(Pu-241 Mass - 1.0 Gram at t = 0)**

**Table 2-14. Tabular Data for Gamma Spectrum of
Pu-242 Parent at 15 Years Post Purification
(Pu-242 Mass - 1.0 Gram at $t = 0$)**

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g
25	1.26E+07	375	0.00E+00
75	3.27E-02	425	1.82E-12
125	3.73E+03	475	1.18E-12
175	4.39E+02	525	8.75E-13
225	0.00E+00	575	5.83E-14
275	0.00E+00	625	7.29E-14
325	0.00E+00	675	1.09E-13

**Figure 2-9. Gamma Spectrum of Pu-242 Parent at
15 Years Post Purification
(Pu-242 Mass - 1.0 Gram at $t = 0$)**

**Table 2-15. Tabular Data for Gamma Spectrum of
Ra-226 Parent at 15 Years Post Purification
(Ra-226 Mass - 1.0 Gram at t = 0)**

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g
25	9.18E+09	1.125	8.88E+09	2.225	1.89E+09
75	9.84E+09	1.175	8.85E+09	2.275	1.38E+09
125	0.00E+00	1.225	2.43E+09	2.325	1.34E+07
175	0.00E+00	1.275	8.88E+09	2.375	7.04E+08
225	2.84E+09	1.325	9.07E+07	2.425	8.90E+08
275	7.87E+09	1.375	1.82E+09	2.475	7.80E+08
325	1.51E+09	1.425	1.46E+09	2.525	2.23E+08
375	1.40E+10	1.475	3.06E+07	2.575	1.49E+08
425	1.18E+09	1.525	1.12E+09	2.625	5.07E+08
475	6.44E+09	1.575	8.00E+08	2.675	1.34E+07
525	1.89E+09	1.625	7.06E+08	2.725	6.89E+08
575	1.81E+09	1.675	8.51E+08	2.775	1.19E+07
625	1.76E+10	1.725	1.18E+09	2.825	9.28E+08
675	8.88E+09	1.775	8.04E+09	2.875	6.04E+08
725	4.14E+09	1.825	8.54E+09	2.925	7.27E+08
775	2.47E+09	1.875	2.10E+09	2.975	9.33E+08
825	8.16E+09	1.925	1.93E+07	3.025	0.00E+00
875	0.00E+00	1.975	2.04E+09	3.075	1.04E+07
925	1.25E+09	2.025	2.89E+07	3.125	7.27E+08
975	0.00E+00	2.075	5.14E+07	3.175	7.52E+08
1.025	0.00E+00	2.125	4.98E+09	3.225	7.43E+04
1.075	0.00E+00	2.175	2.48E+07	3.275	3.73E+04
				3.325	0.00E+00

**Figure 2-10. Gamma Spectrum of Ra-226 Parent at
15 Years Post Purification
(Ra-226 Mass = 1.0 Gram at t = 0)**

**Table 2-16. Tabular Data for Gamma Spectrum of
Th-230 Parent at 15 Years Post Purification
(Th-230 Mass - 1.0 Gram at $t = 0$)**

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g
26	1.06E+06	1.126	6.26E+06	2.226	2.66E+06
76	4.26E+06	1.176	9.61E+04	2.276	1.94E+04
126	3.72E+06	1.226	3.41E+06	2.326	1.87E+03
176	2.32E+06	1.276	7.82E+04	2.376	9.87E+02
226	3.93E+06	1.326	1.27E+04	2.426	8.26E+04
276	1.16E+06	1.376	2.86E+06	2.476	1.09E+02
326	2.11E+04	1.426	2.06E+06	2.526	3.13E+02
376	1.94E+06	1.476	4.26E+03	2.576	2.06E+01
426	1.62E+04	1.526	1.67E+06	2.626	7.11E+01
476	7.67E+04	1.576	7.01E+04	2.676	1.86E+03
526	2.36E+04	1.626	9.90E+02	2.726	9.38E+01
576	2.62E+04	1.676	7.73E+04	2.776	1.67E+03
626	2.46E+06	1.726	1.62E+06	2.826	1.30E+02
676	8.19E+04	1.776	8.47E+06	2.876	8.47E+02
726	8.61E+04	1.826	1.34E+06	2.926	1.02E+03
776	3.46E+03	1.876	2.94E+04	2.976	1.31E+03
826	1.14E+06	1.926	2.71E+03	3.026	0.00E+00
876	0.00E+00	1.976	2.87E+02	3.076	1.46E+03
926	1.76E+06	2.026	3.77E+03	3.126	1.02E+02
976	0.00E+00	2.076	7.21E+03	3.176	1.06E+02
1.026	0.00E+00	2.126	6.96E+04	3.226	1.04E+01
1.076	0.00E+00	2.176	3.44E+03	3.276	6.23E+00
				3.326	0.00E+00

**Figure 2-11. Gamma Spectrum of Th-230 Parent at
15 Years Post Purification
(Th-230 Mass - 1.0 Gram at $t = 0$)**

**Table 2-17. Tabular Data for Gamma Spectrum of
Th-232 Parent at 15 Years Post Purification
(Th-232 Mass - 1.0 Gram at $t = 0$)**

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g
25	1.74E+03	725	4.37E+01	1,425	2.00E+00
75	4.28E+02	775	2.66E+02	1,475	7.49E+01
125	2.10E+02	825	1.17E+02	1,525	2.65E+01
175	5.20E+01	875	1.06E+01	1,575	1.59E+02
225	3.25E+02	925	1.04E+03	1,625	9.74E+01
275	1.45E+02	975	8.36E+02	1,675	1.28E+01
325	6.95E+02	1,025	1.01E+01	1,725	5.24E+00
375	4.95E+00	1,075	1.15E+01	1,775	2.08E+00
425	8.47E+01	1,125	1.69E+01	1,825	4.83E+00
475	1.72E+02	1,175	9.11E+00	1,875	4.99E+00
525	4.14E+01	1,225	2.54E+01	1,925	2.64E+00
575	1.07E+02	1,275	4.79E+00	1,975	3.31E+00
625	1.44E+01	1,325	1.91E+00	2,025	0.00E+00
675	4.13E+01	1,375	1.69E+00		

**Figure 2-12. Gamma Spectrum of Th-232 Parent at
15 Years Post Purification
(Th-232 Mass - 1.0 Gram at $t = 0$)**

**Table 2-18. Tabular Data for Gamma Spectrum of
U-233 Parent at 15 Years Post Purification
(U-233 Mass - 1.0 Gram at $t = 0$)**

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g
25	2.50E+07	625	8.20E+00
75	3.82E+05	675	1.07E+01
125	1.53E+05	725	9.80E+00
175	8.26E+04	775	0.00E+00
225	1.40E+05	825	0.00E+00
275	3.47E+04	875	7.40E+00
325	4.41E+04	925	0.00E+00
375	4.12E+03	975	0.00E+00
425	8.27E+02	1,025	2.94E+01
475	8.80E+02	1,075	0.00E+00
525	1.31E+02	1,125	2.94E+01
575	3.12E+01	1,175	0.00E+00

**Figure 2-13. Gamma Spectrum of U-233 Parent at
15 Years Post Purification
(U-233 Mass - 1.0 Gram at $t = 0$)**

**Table 2-19. Tabular Data for Gamma Spectrum of
U-235 Parent at 15 Years Post Purification
(U-235 Mass - 1.0 Gram at $t = 0$)**

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g
25	1.24E+05	575	5.03E-03
75	1.62E+04	625	1.62E-04
125	1.32E+04	675	5.27E-06
175	5.12E+04	725	3.20E-01
225	5.16E+03	775	4.80E-01
275	6.61E+01	825	4.15E-04
325	4.60E+01	875	4.60E-05
375	6.66E+01	925	1.18E-04
425	3.30E+00	975	9.16E-06
475	6.40E+00	1,025	2.63E-22
525	3.25E-01	1,075	0.00E+00

**Figure 2-14. Gamma Spectrum of U-235 Parent at
15 Years Post Purification
(U-235 Mass - 1.0 Gram at $t = 0$)**

**Table 2-20. Tabular Data for Gamma Spectrum of
U-238 Parent at 15 Years Post Purification
(U-238 Mass - 1.0 Gram at $t = 0$)**

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g
25	1.63E+04	725	1.95E+03	1,425	7.59E+01
75	7.48E+03	775	1.39E+03	1,475	1.90E+02
125	4.49E+03	825	2.26E+03	1,525	6.32E+01
175	1.44E+03	875	4.22E+03	1,575	1.29E+02
225	2.22E+03	925	8.04E+03	1,625	6.96E+01
275	7.52E+02	975	1.14E+03	1,675	2.53E+02
325	1.96E+02	1,025	2.39E+02	1,725	2.79E+01
375	6.07E+02	1,075	1.26E+02	1,775	9.61E+01
425	1.56E+02	1,125	2.02E+02	1,825	1.14E+01
475	4.53E+02	1,175	6.82E+01	1,875	5.81E+01
525	6.77E+02	1,225	1.86E+02	1,925	1.05E+02
575	2.31E+03	1,275	1.39E+02	1,975	5.06E-01
625	6.19E+02	1,325	0.00E+00	2,025	0.00E+00
675	1.73E+03	1,375	6.38E+02		

**Figure 2-15. Gamma Spectrum of U-238 Parent at
15 Years Post Purification
(U-238 Mass - 1.0 Gram at $t = 0$)**

**Table 2-21. Tabular Data for Gamma Spectrum of
Heat Source Plutonium at 15 Years Post
Purification (HSPu Mass - 1.0 Gram at t = 0)**

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g
25	8.13E+10	925	8.38E+03	1.825	9.22E+02
75	1.29E+08	975	1.70E+03	1.875	0.00E+00
125	8.37E+06	1.025	7.78E+03	1.925	0.00E+00
175	4.41E+06	1.075	6.17E+03	1.975	0.00E+00
225	4.31E+06	1.125	1.38E+00	2.025	0.00E+00
275	2.37E+04	1.175	7.89E+01	2.075	0.00E+00
325	3.42E+04	1.225	0.00E+00	2.125	0.00E+00
375	1.06E+04	1.275	1.47E+02	2.175	0.00E+00
425	8.47E+03	1.325	0.00E+00	2.225	0.00E+00
475	8.37E+02	1.375	1.97E+01	2.275	0.00E+00
525	8.48E+04	1.425	0.00E+00	2.325	0.00E+00
575	1.34E+04	1.475	0.00E+00	2.375	0.00E+00
625	3.29E+02	1.525	2.84E+03	2.425	0.00E+00
675	1.31E+03	1.575	0.00E+00	2.475	0.00E+00
725	9.18E+04	1.625	1.14E+04	2.525	0.00E+00
775	1.91E+06	1.675	6.16E+02	2.575	0.00E+00
825	8.92E+03	1.725	5.63E+00	2.625	2.93E+05
875	8.39E+04	1.775	0.00E+00	2.650	0.00E+00

**Figure 2-16. Gamma Spectrum of Heat Source
Plutonium at 15 Years Post Purification
(HSPu Mass - 1.0 Gram at t = 0)**

Table 2-22. Tabular Data for Gamma Spectrum of Weapons Grade Plutonium at 15 Years Post Purification (WGPu Mass - 1.0 Gram at $t = 0$)

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin Midpoint keV	Gamma Emission photons/sec-g
25	1.10E+08	675	1.56E+03
75	8.86E+07	725	6.89E+02
125	4.37E+05	775	4.16E+02
175	1.83E+04	825	2.18E+01
225	4.96E+04	875	1.30E+01
275	4.90E+03	925	4.03E+00
325	3.54E+04	975	2.66E+00
375	6.30E+04	1,025	1.38E+00
425	3.53E+04	1,075	1.04E+00
475	4.33E+03	1,125	1.49E-09
525	2.13E+02	1,175	0.00E+00
575	8.14E+01	1,225	0.00E+00
625	9.69E+02		

Figure 2-17. Gamma Spectrum of Weapons Grade Plutonium at 15 Years Post Purification (WGPu Mass - 1.0 Gram at $t = 0$)

15-year decay time due to an initial time zero parent or parent compound mass of one gram. It is to be noted that using an ordinate scale of this nature is not precisely correct as photon/sec/gram/50 keV bin values less than 1.0 are not plotted. Nevertheless, such a representation is adequate for purposes of displaying the photon yield energy dependence.

2.4 Neutron Data

Neutrons are generated in plutonium-bearing wastes from the spontaneous fission of the even-numbered plutonium isotopes and from interactions of alpha decay emissions with light elements in the waste matrix, i.e., (α ,n) reactions. The number of neutrons generated per gram of waste-entrained plutonium therefore depends on both the isotopic composition of the plutonium and its chemical form. This condition complicates any effort to characterize the neutron source term as it is in most cases impossible to reliably know the plutonium chemical compounds existing in a given waste container to the extent necessary to calculate a neutron source term. For this reason, an alternate method has been devised to provide some bounds on the expected neutron source term. Methods and results presented in this section are based on work by East (1994).²⁻⁵

The method is based on the evaluation of a database²⁻⁶ containing neutron measurement data on approximately 13,000 drums of Rocky Flats Plant (RFP)-generated waste acquired at the SWEPP waste characterization facility. The resulting average neutron source term estimates are tabulated as a function of waste category, i.e., content code. The data is necessarily presented in this manner as the waste process generating a given content code is expected to contain similar plutonium chemical compounds which in turn should have a similar neutron source term in units of neutrons/sec/gram-plutonium. In addition to the database analysis, calculations are performed to independently estimate the neutron source term based on tabulated neutron yields for the various plutonium and nonplutonium isotopes as a function of chemical form. This data is used to substantiate and to some extent validate the results obtained from the database analysis.

The result of the above neutron source term estimation method is that it is dependent upon a waste form type. Therefore, subsequent use of such data must be qualified relative to the waste form for which it has been specified. The calculational method is presented first, followed by the results of the neutron measurement database analysis. To support the calculational method, discussion is required on the origin of neutrons emitted from the radioactive constituents of ALLW waste. Additionally, estimates are made of the various isotopic and waste chemical forms such that neutron yields can be calculated.

2.4.1 Calculational Method

Fast neutrons are emitted by plutonium as the result of the following processes:

- Spontaneous fissioning of the even-numbered isotopes (i.e., ²³⁸Pu, ²⁴⁰Pu, and ²⁴²Pu)
- Nuclear reactions induced by alpha particles from radioactive decay with light elements (Al, O, F, etc.) in intimate contact with the plutonium [(α ,n) reactions]
- Fissions produced by the exposure of the odd-numbered isotopes (principally ²³⁹Pu) to thermal neutrons.

For ALLW waste forms containing plutonium, a negligible number of neutrons are produced from fissions induced by the neutrons resulting from radioactive decay (e.g., very little neutron multiplication will occur). Therefore, the primary sources of neutrons from waste are spontaneous fission and (α ,n) reactions. Table 2-23 lists the spontaneous fission neutron yields for nonmultiplying samples, and neutron yields from (α ,n) reactions for common plutonium compounds. Yields from ^{241}Am are included in this table since this nuclide results from the radioactive decay of ^{241}Pu and is always present in plutonium-bearing waste.

As can be seen from Table 2-23, not only does the neutron emission rate per gram of source material depend upon the isotopic composition, but it is also highly dependent upon the chemical form due to the vastly different (α ,n) yields of different elements. It also depends upon the age of the material due to the build-up of ^{241}Am from the decay of ^{241}Pu (14.4 year half-life). Table 2-24 lists the expected neutron yields for some isotopic compositions and chemical forms representative of the waste. Note that elevated concentrations of ^{241}Am will significantly increase the neutron output from oxides, fluorides, etc. but not from pure metals.

Tables 2-23 and 2-24 are provided to illustrate nominal neutron emission rates expected per gram of isotope. The Table 2-24 WG Pu values for 90% PuO_2 /10% PuF_4 and PuO_2 on glass were calculated based on waste form source configuration estimates.²⁻⁸ As it will be shown, these values should be and are reasonably close to applicable neutron source term values as derived from the neutron measurement database analysis addressed in the next section.

Tabulated uranium neutron yields are provided because several uranium isotopes are identified in Table 2-1. As the RFP-generated waste is comprised primarily of WG Pu, there is no database of uranium mass measurements for comparison. Uranium will produce neutrons by the same mechanisms as plutonium: spontaneous fission, (α ,n) reactions on light elements, and thermal neutron-induced fission (the latter can, in most cases, be ignored unless there is a strong external source of neutrons present). With the exception of light element compounds containing significant quantities of the lighter uranium isotopes (232-234), neutron emission from uranium-bearing waste is generally insignificant. However, kilogram quantities of uranium will produce measurable neutron emissions for all enrichments (15 to 40 n/sec/kg for oxides and nitrates, 700 to 3000 n/sec/kg for fluorides).²⁻⁷ Neutron yields²⁻⁷ from uranium isotopes and their most common chemical compounds (UO_2 and UF_6) are shown in Table 2-25.

Other nuclides that may be present in retrievably-stored wastes (Table 2-1) may also produce neutron emissions, either by spontaneous fission or (α ,n) reactions. The emission rates for the most important nonuranium and nonplutonium nuclides are listed in Table 2-26.

2.4.2 Neutron Measurement Database Analysis

A database containing information from the SWEPP passive/active neutron (PAN) drum assay system²⁻⁶ was used to calculate actual average neutron emission rates for many of the retrievably-stored RFP waste categories.

Table 2-23. Neutron yields for plutonium isotopes and ²⁴¹Am.

Isotope	Neutron yields (n/sec/gm of isotope)				
	Spontaneous fission	(α,n) reactions ^a			
		Oxygen	Fluorine	Beryllium	Boron
²³⁸ Pu	2.5×10^3	1.5×10^4	2.8×10^6	2.5×10^7	5.4×10^6
²³⁹ Pu	2.3×10^2	4.5×10^1	6.9×10^3	7.4×10^4	3.1×10^4
²⁴⁰ Pu	9.9×10^2	1.5×10^2	2.5×10^4	2.7×10^5	6.0×10^4
²⁴¹ Pu	$\sim 5 \times 10^2$	1.4	2.1×10^2	2.5×10^3	6.1×10^2
²⁴² Pu	1.7×10^3	2.1	3.3×10^2	3.9×10^3	9.5×10^2
²⁴¹ Am	~1.3	2.7×10^3	5.5×10^5	3.5×10^6	7.6×10^5

a. Thin targets are assumed for oxygen and fluorine with atom ratios of two (PuO₂) and four (PuF₄), respectively. The beryllium and boron values are based on thick target yields from Reference 2-7.

Table 2-24. Representative neutron yields per gram Pu.

Material	Neutron yields (n/sec/gm-Pu)			
	Pure metal ^a	Oxide (PuO ₂)	90% PuO ₂ , 10% PuF ₄	PuO ₂ on glass ^b
WG Pu ^c	6.2×10^1	1.2×10^2	1.1×10^3	1.6×10^3
WG Pu with 50 wt% ²⁴¹ Am	6.4×10^1	3.0×10^3	6.2×10^4	3.8×10^4
Med Burnup Pu ^d	1.4×10^2	2.4×10^2	2.0×10^3	2.4×10^3
Heat Source Pu ^e	1.5×10^4	1.1×10^5	1.8×10^6	2.8×10^6

a. No significant neutron multiplication present.

b. Boro-silicate glass composed of 12% B₂O₃ (natural boron) and 88% SiO₂. Fifty percent of the thick target yields²⁻⁸ were used for the B, O and Si contained in the glass.

c. "Weapons grade" (low burnup) plutonium; ~94% ²³⁹Pu, 6% ²⁴⁰Pu fifteen years after chemical purification.

d. Moderate burnup (~12 MWD/t) plutonium; ~87% ²³⁹Pu, 12% ²⁴⁰Pu fifteen years after chemical purification.

e. Approximately 85% ²³⁸Pu, 15% ²³⁹Pu fifteen years after chemical purification.

Table 2-25. Neutron yields for uranium isotopes.

Isotope	Yields (n/sec/gm-isotope)		
	Spontaneous fission	(α,n) reactions	
		UO ₂	UF ₆
²³² U	1.7	1.7×10^4	3.6×10^6
²³³ U	$<4.0 \times 10^{-4}$	4.7	7.9×10^2
²³⁴ U	7.6×10^{-3}	3.0	5.1×10^2
²³⁵ U	1.1×10^{-5}	7.2×10^{-4}	1.0×10^{-1}
²³⁶ U	4.4×10^{-3}	2.4×10^{-2}	3.3
²³⁸ U	1.4×10^{-2}	8.5×10^{-5}	1.1×10^{-2}

Note: ²³⁷U is not included in Table 2-25 since its beta decay does not give rise to neutron emission.

Table 2-26. Neutron yields for other nuclides.

Isotope	Yields (n/sec/gm-isotope)		
	Spontaneous fission	(α,n) reactions	
		Oxygen	Fluorine
²²⁶ Ra	0	$\sim 4.5 \times 10^2$	$\sim 7.5 \times 10^4$
²³⁰ Th	0	~8	$\sim 1.5 \times 10^3$
²³² Th	0	$<5 \times 10^{-5}$	$<8 \times 10^{-2}$
²³⁷ Np	0	~0.4	~50
²⁴³ Am	~4	$\sim 1.4 \times 10^2$	$\sim 2.5 \times 10^2$
²⁴² Cm	2.3×10^7	4.2×10^6	9.2×10^8
²⁴⁴ Cm	1.1×10^7	8.5×10^4	1.8×10^7
²⁵² Cf	2.3×10^{12}	6.9×10^5	1.5×10^8

The number of neutrons emitted per second by an individual drum is calculated from:

$$N_r = (T_r - B_{avg}) / \epsilon_n$$

where

T_r = Summed (total) count-rate from all neutron detectors in the drum assay system

B_{avg} = Average background rate (28.13 counts/sec)

ϵ_n = Measured total neutron detection efficiency of the drum assay neutron system (0.1263).²⁻⁹

Note that no matrix corrections (for neutron absorption, etc.) are applied. This typically will result in an underestimation on the order of 15%.

The neutron emission rate value is next divided by the Pu mass to obtain the neutron source term in units of neutrons/second-gram Pu. Three mass values are available in the database:

1. As declared by the waste generator (RFP)
2. As determined by the SWEPP NDA system in active mode
3. As determined by the SWEPP NDA system in passive mode.

Neutron emission rates were then obtained for each waste drum by dividing N_r by each of the three available masses. These values were then sorted and averaged for each waste category and content code available in the sample set.

The results are shown in Table 2-27 for each content code category in which at least five reliable mass measurements were obtained. The column labeled "Sample Size" gives the number of drums in each content code used in the average. Two average emission rates are shown for each waste category, one using generator RFP declared WG Pu mass values (labeled "RFP Mass") and the other (labeled "PAN Mass") based on SWEPP measurements; active neutron measurement mode results for sludges and passive neutron mode results are given for all other waste categories.

The values shown in Table 2-27 are consistent with the calculated values shown in the first two rows of Table 2-24 which are generally representative of source configurations of actual waste categories. There is also reasonable agreement (within a factor of two) between most emission rates based on RFP-supplied mass values and the SWEPP-derived mass values; the most notable exception is the sludge content code 4 for which an order-of-magnitude difference exists. It should be noted that many of the RFP masses in the database have been rounded to the nearest gram (masses in the range 0.0 to 0.5 entered as 0.0, values in the range 0.5 to 1.5 entered as 1.0, etc.). This may tend to bias neutron emission rates high for low plutonium content wastes (such as content code 2).

Table 2-27. Average retrievably-stored waste neutron emission rates.

Content code	Sample size	Average (n/sec/gm-Pu)		Waste description
		RFP mass	PAN mass	
1	1393	9.4×10^3	7.4×10^3	First-stage sludge
2	28	3.8×10^3	1.3×10^3	Second-stage sludge
3	71	9.7×10^2	8.2×10^2	Organic setups, oil solids
4	123	3.2×10^3	4.4×10^2	Special setups (cemented)
7	361	2.4×10^3	8.4×10^2	Dry (cemented) sludge
111	22	1.1×10^3	5.3×10^2	Inorganic solids and wet sludges
115	10	2.2×10^2	2.1×10^2	Graphite waste
123	8	2.5×10^2	3.6×10^2	Leaded rubber
292	110	2.7×10^2	4.6×10^2	Cemented sludge
300	503	3.2×10^2	3.1×10^2	Graphite molds
303	18	1.7×10^2	2.2×10^2	Graphite molds and cores
320	51	6.0×10^2	1.1×10^3	Heavy non-SS metals (tantalum)
330	33	8.6×10^2	3.3×10^3	Dry paper and rags
335	7	1.1×10^3	2.0×10^3	Absolute 8 x 8 filters
336	46	7.9×10^2	1.1×10^3	Moist paper and rags
337	75	1.8×10^3	1.5×10^3	Plastics, Teflon, PVC
338	14	1.3×10^3	2.9×10^3	Insulation and CWS filter media
339	28	2.4×10^2	4.7×10^2	Leaded rubber gloves and aprons
371	30	4.2×10^2	6.8×10^2	Firebrick
374	5	1.3×10^3	5.1×10^2	Blacktop, concrete, dirt and sand
376	556	1.1×10^3	1.7×10^3	Cemented insulation/filter media
414	5	4.4×10^2	4.9×10^2	Direct oxide reduction salts
432	53	1.5×10^2	4.8×10^2	Leached and cemented resin
440	153	7.2×10^2	1.1×10^3	Glass
442	119	8.0×10^2	1.7×10^3	Leached Raschig rings
480	204	7.8×10^2	1.0×10^3	Unleached light non-SS metal
481	28	7.4×10^2	7.7×10^2	Leached light non-SS metal

The high average neutron rates for content code 1 waste can be attributed to the high ^{241}Am content of many of these waste drums. Many process wastes (sludges) also contain significant amounts of light elements other than oxygen (B, Cl, F, etc.) in intimate contact with alpha emitters, resulting in elevated (α, n) production levels.

For Rocky Flats waste categories not covered in this sampling, a nominal upper limit of $\sim 10^4$ neutrons per second per gram of Pu is considered to be a safe assumption. The neutron emission rates for most wastes containing combustibles, metal scrap, etc. can be reasonably expected to lie in the range 2×10^2 to 2×10^3 .

2.5 References

- 2-1. Becker, G. K. (*RWMC EDF 629-Rev. 1*), *Alpha Activity Distribution Due to Selected TRU and Non-TRU Source Materials at 15 Years Post Purification Date*, RWMC EDF-690, December 2, 1993.
- 2-2. Browne E. and R. B. Firestone, *Table of Radioactive Isotopes*, John Wiley & Sons, 1986.
- 2-3. U.S. Department of Energy Order 5820.2A, "Radioactive Waste Management," Office of Defense Waste and Transportation Management, U.S. Department of Energy, Washington, D.C., September 26, 1988.
- 2-4. Becker, G. K., *Low-Level Alpha Contaminated and Transuranic Waste Photon/Electron Source Term Data*, RWMC EDF-669, January 10, 1994.
- 2-5. East, L. V., *Neutron Source Terms for Rocky Flats-Generated Waste at the INEL*, RWMC EDF-694, January 7, 1994.
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- 2-7. Anderson M. E. and J. F. Lemming, *Selected Measurement Data for Plutonium and Uranium*, Mound Laboratory report MLM-3009/ISPO-157, November 1982.
- 2-8. Terry, I. R., "A Practical Algorithm to Derive the (α , n) Source Term in a Composite Mixture Containing Actinides," *Nuclear Science Engineering* 113, p. 282, 1993.
- 2-9. East, L. V., *Pink Drum Calibration and Verification Calculations for FTC-CF-Z284 Californium Source*, RWMC-EDF-54, May 1992.

3. INEL WASTE PROFILE SHEET FORMAT

The description of the contents and format of the INEL Waste Profile Sheets for ALLMWs and ALLWs is provided below. Each ALLMW profile sheet contains six sections (*Identification, Description, Storage, Design Basis EPA Contaminant Concentration Data, Design Basis Radionuclide and Alpha Activity Concentration Data, and Design Basis Bulk Waste Materials*). Each ALLW profile sheet contains five sections (*Identification, Description, Storage, Design Basis Radionuclide and Alpha Activity Concentration Data, and Design Basis Bulk Waste Materials*). The Idaho Mixed Waste Information (IMWI)³⁻¹ database currently being used at the INEL to aid in FFCA compliance reporting was used as the basis for identification, description, and storage data provided in the following waste profile sheets. The remaining data in these profile sheets were generated for the purposes of this report.

3.1 Section A: Identification

Section A provides general identification information about waste categorized under a specific content code. The following fields appear in the identification section:

<i>INEL ID/Name</i>	An INEL-assigned waste stream number and name. This designation has been used in the Federal Facility Compliance Act (FFCA) ³⁻² reports and Waste Management Information System (WMIS) ³⁻³ reports provided by INEL.
<i>C. Code/Name</i>	Content Code Number followed by the name of the Content Code.

3.2 Section B: Description

Section B contains descriptive information including the category of radioactive waste, physical form, estimated combustibility, and whether waste is reported to contain polychlorinated biphenyls (PCBs). Also included is a summary description of the content code.

The Description section contains the following fields:

<i>INEL ID (WMIS) Description</i>	INEL waste stream description. This is usually the waste stream description provided in WMIS.
<i>Total Volume (m³)</i>	Total volume, in cubic meters.
<i>Gross Mass (kg)</i>	Sum of the net container mass and mass of the waste matrix, in kilograms.
<i>Drum Equivalents</i>	The <i>total volume</i> expressed in 55-gallon (0.212 m ³) drum equivalents.
<i>Physical Form</i>	Physical form of the waste (i.e., solid, liquid).

<i>Physical Type</i>	Type of solid or liquid waste [types of solids include: sludge, soil, metal, plastic, rubber, glass, rags, filters, paper, absorbent materials, labpack, contaminated equipment, construction/decontamination and decommissioning (D&D) debris, and other; types of liquids include: wastewater, nonwastewater, labpack].
<i>PCBs</i>	If PCBs are present in the waste, the box is marked with an "X."
<i>Combustibility</i>	Combustibility of the waste material. (<i>Combustible</i> , >90%; <i>Partially Combustible</i> , 10–90%; and <i>Noncombustible</i> , <10%).
<i>Waste Type</i>	Radioactive waste category: Alpha low-level waste (ALLW); Transuranic waste (TRU); Alpha low-level mixed waste (ALLMW); Transuranic mixed waste (TRUMW). Definitions of these waste types are provided in Section 1 of this document.
<i>Rad. Level</i>	Radiation level of the waste for handling purposes in accordance with DOE Order 5820.2A. ³⁻⁴ <i>Contact-handled</i> is defined as packaged transuranic waste whose external surface dose rate does not exceed 200 mrem per hour. <i>Remote-handled</i> transuranic waste is defined as packaged transuranic waste whose external surface dose rate exceeds 200 mrem per hour. Some of the waste was shielded so that the containers could be contact-handled. If any portion of a content code was known to be remote-handled, the entire content code was listed as remote-handled.
<i>Content Code Description</i>	Description of waste generation and any specific media or packaging information that has been reported. The content code descriptions have been extracted from existing references. The <i>content code name</i> and <i>content code description</i> fields for some waste streams may incorrectly state or infer that the waste is transuranic. The discrepancy exists because the transuranic waste definition was revised, with the lower limit for transuranic activity increased from 10 to 100 nCi/g. As a result, the content code name and content code description may incorrectly state that the waste is transuranic, or infer that it is transuranic with statements that include the words "WIPP," "WIPP-WAC," "certifiable," "uncertifiable," "TRAMPAC," and "TRUPACT." The historical text is left intact since these statements often convey additional information concerning the nature of the waste media and its contaminants via the WIPP-WAC in effect when the waste was certified or considered for

certification. The WIPP-WAC addresses the presence of free liquids, fines, pyrophorics, etc. Waste profile sheets that contain erroneous content code names or descriptions are flagged at the end of the content code description with the following editorial comment: "{Content code name and/or description incorrectly states or infers that waste is transuranic.}"

3.3 Section C: Storage

The storage section of the INEL Waste Profile Sheet contains information concerning the inventory of waste containers in storage. Values in this section of the Profile Sheet represent actual quantities in storage. The volume of waste was calculated based on the type of container: drum, box, bin, or insert. The gross mass was determined from storage records. Gross mass refers to net container mass plus mass of the waste. The fields listed in the storage section include:

<i># of Cont.</i>	Number of each container type.
<i>Container Type</i>	Type of container used for waste storage, i.e., drum, box, bin, insert.
<i>Total Vol. (m³)</i>	Volume of the containers in cubic meters based on typical waste volumes for each container.
<i>Gross Mass (kg)</i>	Sum of the net container mass and mass of the waste, in kilograms.
<i>Waste Description</i>	In most cases this is a repeat of the content code name. In cases where waste description information is available, it is provided.

At the INEL, stored TRU and ALLW wastes are tracked by two database systems: the Radioactive Waste Management Information System (RWMIS) and the Transuranic Waste Database (TWDB). RWMIS is thought to accurately represent the total quantity of waste in storage. However, it is missing content codes for many shipments, making it impossible to assign containers to a waste stream represented at the content code level. TWDB provides content code information for all containers identified in the database, but is missing a large percentage (~20%) of the total waste. Various studies have attempted to resolve the discrepancies between these two databases. For this report, the IMWI database, which reflects FFCA 180-day reporting information and resolves discrepancies between the RWMIS and TWDB, was used as the basis for inventory information. This database reports inventory values by typical container type. The following typical container volumes (external) were used in estimates of gross waste volume:

Drum	0.212 m ³
Box	3.17 m ³
Bin	3.50 m ³
Insert	0.212 m ³

The IMWI cites a previous study which used TWDB and RWMIS reports to resolve known discrepancies, and found that the two databases are in good agreement except for the missing volume of waste (~20%) in TWDB.

The difference in waste quantity between RWMIS and the known content code quantities was calculated and assigned to a pseudo content code, 9999. A waste mass was calculated for this code by using the average density of all other content codes and the above calculated volume. This calculation assumes that content code 9999 composition is similar to the other waste with known content codes.

3.4 Section D: Design Basis EPA Contaminant Concentration Data

Section D of the INEL Waste Profile Sheet identifies hazardous constituents as defined under the Resource Conservation and Recovery Act (RCRA) reported to be present in the waste. Hazardous waste codes number(s), associated hazardous waste descriptions, and design basis contaminant concentrations are reported to assist in treatment facility design. This section appears only in INEL Waste Profile Sheets that describe mixed wastes (i.e., ALLMW). EPA contaminants data are not provided for those wastes that are only radioactive and contain no RCRA hazardous materials.

The following fields appear in this section of the profile sheet.

<i>EPA Haz. Waste Code</i>	The hazardous waste number [as defined in Title 40 of the Code of Federal Regulations Part 268 (40 CFR 268)] ³⁻⁵ for the constituent reported.
<i>Category</i>	Hazardous waste description as defined in 40 CFR 268. ³⁻⁵
<i>Chemical Constituent</i>	Treatment subcategory as defined in 40 CFR 268.
<i>Design Basis Information</i>	
<i>CAS #</i>	Chemical abstract system number for chemical constituent.
<i>Estimated Conc. (mg/kg)</i>	Estimated concentration of constituent present in the waste.
<i>Assumed Max. Conc. (mg/kg)</i>	Assumed maximum concentration of hazardous constituent present in the waste.

Source information used to identify presence of contaminants was in accordance with the current IMWI database and supporting documentation used for compliance of the Federal Facilities Compliance Act (180 day) reporting requirements. Information provided to comply with these reporting requirements contained estimated listings of contaminants present in the waste; however, definitive information on contaminant concentrations present in the waste was not available at that time. Further document review for presence of contaminants resulted in the additional listing of some constituents in a few of the waste streams.

The concentration information presented in Section D of the INEL Waste Profile Sheets was derived from previous work by Raivo and Pace (1994).³⁻⁶ This documentation is consistent with that used for presentation of hazardous information data presented in Table B-6 of the *Statement of Work for a Feasibility Study on Treatment Services for Alpha-Contaminated Mixed Low-Level Waste*, dated December 15, 1993.³⁻⁷ Additional compilations and assumptions were made in order to expand and quantify concentration values and present bounding estimates. Confidence in the accuracy of the estimated concentration values given at a content code level based on past documentation is low, however this information is considered the best available at this time.

Assumed maximum concentrations are shown at a content code level and are considered to represent bounding values for listed constituents with a margin of conservatism. The intent of this presentation is to provide a consistent basis for use in preparation and evaluation of feasibility studies or proposals for treatment services. Waste stream or content code entries showing no concentration values indicate that no information was available at the time of the printing of this document. Future updates will present an assumed maximum concentration.

Results of the latest FFCA reporting efforts performed during the fall and winter of 1993 were not available at the time of preparation of this document. This latest information will be incorporated in future document updates.

Ongoing characterization efforts being performed at the INEL will increase the confidence in some concentration values presented in future waste descriptions, and any additional information acquired during retrieval efforts prior to any transport of the waste will be made available. Efforts necessary to obtain high confidence data in all the varied waste streams may not be economically feasible, therefore generation of any facility Waste Acceptance Criteria for input waste streams should allow for a sufficient margin of conservatism.

Preliminary Transuranic Storage Area (TSA)-stored waste hazardous information presented in the December 15, 1993 *Statement of Work for a Feasibility Study on Treatment Services for Alpha-Contaminated Mixed Low-Level Waste*, is shown in Table 3-1.³⁻⁷ To provide more complete waste constituent information, some materials not classified as hazardous have been included in this table. Priority from any discrepancies between review of the average mass fraction of total waste values contained in Table 3-1 and any rollup values from the profile sheet content code level should be given to Table 3-1 values. However, individual review by content code level should utilize the assumed maximum concentrations given. In addition, for any reviews at an individual container level, values for constituent maximum fractions should be as shown in Table 3-1.

Table 3-1. Preliminary TSA-stored waste hazardous information for use in conducting feasibility studies.^a

Hazardous constituent	Average mass fraction of total waste	Maximum fraction of any waste container
1,1,1-trichloroethane	0.00581	0.1500
Carbon tetrachloride	0.00627	0.0500
1,1,2-trichloro-1,2,2-trifluoroethane	0.00371	0.0500
Trichloroethene	0.00392	0.1500
Perchloroethylene	0.00062	0.0500
Methylene chloride	0.00040	0.0010
Methyl alcohol	0.000008	0.000025
Butyl alcohol	0.000003	0.00001
Xylene	0.00002	0.00005
Cadmium	0.000003	0.00001
Lead	0.00826	0.6000
Mercury	0.00354	0.2000
Lithium	0.00177	0.2000
Beryllium	0.00021	0.9500
Nitric acid	0.00190	0.5050
Nitrates	0.00037	0.9000
Polychlorinated biphenyls ^{b,c}	0.00854	0.5560
Asbestos ^c	0.00274	0.4500

a. These chemical contaminants are representative of waste currently at the TSA.

b. To provide more complete waste information, concentration data for some toxic (TSCA) waste constituents not considered hazardous under RCRA are provided.

b. As many as 7,600 drums stored in the TSA are suspect for containing PCBs. The actual number of drums is unknown. These drums are estimated to be within the code 000 (Unknown) or code 003 (Organic setups) waste streams. For purposes of treatment services feasibility studies, PCB concentration within these 7,600 drums is considered to be >500 ppm.

3.5 Section E: Design Basis Radionuclide and Alpha Activity Concentration Data

This section of the INEL Waste Profile Sheet provides a description of the radionuclide and associated alpha activity waste characterization data. Reference should be made to Section 2 of this report for a complete description of the types of data presented and the methods used to obtain this information. In addition, Section 2 contains related information on beta, photon, and neutron source term data that can be used with the waste characterization data provided in these Profile Sheets.

The TRU alpha activity reported in Section E consists of alpha-emitting transuranium radionuclides (an alpha-emitting radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15-year post purification date, or decay date. Fifteen years is a representative waste age average.

Values of gross mass presented in the tables in Section E are based on stored quantities for which radiological data are available. For this reason, these values may not agree with those reported in Section C: Storage data in the Profile Sheets. Gross mass refers to container mass plus waste mass. Waste mass refers to the mass of the waste only, and does not include the mass of the container. Both are provided in the event some of the waste may be treatable after container removal.

In addition, it should be noted that Pu-52 and Pu-83 are database nomenclature for weapons-grade plutonium (WG Pu) and heat-source plutonium (HS Pu), respectively. The reader is referred to Section 2, Table 2-2 for the nominal isotopic compositions of these mixtures.

Section E of the Profile Sheet is divided into two major parts. The first part, Alpha Activity Concentration Profile, uses the transuranic alpha activity concentration intervals identified in Table 3-2. Since transuranic alpha activity concentration is currently the fundamental unit for classifying and managing defense-generated waste forms, these intervals were chosen to provide a more complete representation of the waste within a designated content code. It should be noted that due to limitations of the nondestructive assay equipment, alpha activity concentrations below 100 nCi/g are not measured with a high degree of confidence. Therefore, the lowest interval used in the Profile Sheets is

$0 \leq \text{TRU alpha activity concentration} < 100 \text{ nCi/g}$

Because alpha low-level waste is by definition less than 100 nCi/g, all waste described in this report is categorized within Interval 0.

In the second part of Section E, Isotopic Composition Profile, radionuclides present in the designated waste content code are identified. The mass (in grams) of each radionuclide is tabulated. In addition, the associated TRU alpha activity, non-TRU alpha activity, and total alpha activity are provided per gram of gross mass and per gram of waste mass, respectively, for each radionuclide. For explanation of the determination of TRU and non-TRU alpha activity, see Section 2 of this report.

Table 3-2. TRU alpha activity concentration intervals.

Interval number		Interval description			
0			TRU alpha activity conc	<	100 nCi/g ^a
1	100 nCi/g	⊆	TRU alpha activity conc	<	500 nCi/g
2	500 nCi/g	⊆	TRU alpha activity conc	<	1,000 nCi/g
3	1,000 nCi/g	⊆	TRU alpha activity conc	<	2,000 nCi/g
4	2,000 nCi/g	⊆	TRU alpha activity conc	<	3,000 nCi/g
5	3,000 nCi/g	⊆	TRU alpha activity conc	<	4,000 nCi/g
6	4,000 nCi/g	⊆	TRU alpha activity conc	<	5,000 nCi/g
7	5,000 nCi/g	⊆	TRU alpha activity conc	<	6,000 nCi/g
8	6,000 nCi/g	⊆	TRU alpha activity conc	<	7,000 nCi/g
9	7,000 nCi/g	⊆	TRU alpha activity conc	<	8,000 nCi/g
10	8,000 nCi/g	⊆	TRU alpha activity conc	<	9,000 nCi/g
11	9,000 nCi/g	⊆	TRU alpha activity conc	<	10,000 nCi/g
12	10,000 nCi/g	⊆	TRU alpha activity conc	<	20,000 nCi/g
13	20,000 nCi/g	⊆	TRU alpha activity conc	<	30,000 nCi/g
14	30,000 nCi/g	⊆	TRU alpha activity conc	<	40,000 nCi/g
15	40,000 nCi/g	⊆	TRU alpha activity conc	<	50,000 nCi/g
16	50,000 nCi/g	⊆	TRU alpha activity conc	<	60,000 nCi/g
17	60,000 nCi/g	⊆	TRU alpha activity conc	<	70,000 nCi/g
18	70,000 nCi/g	⊆	TRU alpha activity conc	<	80,000 nCi/g
19	80,000 nCi/g	⊆	TRU alpha activity conc	<	90,000 nCi/g
20	90,000 nCi/g	⊆	TRU alpha activity conc	<	100,000 nCi/g
21	100,000 nCi/g	⊆	TRU alpha activity conc	<	200,000 nCi/g
22	200,000 nCi/g	⊆	TRU alpha activity conc	<	300,000 nCi/g
23	300,000 nCi/g	⊆	TRU alpha activity conc	<	400,000 nCi/g
24	400,000 nCi/g	⊆	TRU alpha activity conc	<	500,000 nCi/g
25	500,000 nCi/g	⊆	TRU alpha activity conc	<	600,000 nCi/g
26	600,000 nCi/g	⊆	TRU alpha activity conc	<	700,000 nCi/g
27	700,000 nCi/g	⊆	TRU alpha activity conc	<	800,000 nCi/g
28	800,000 nCi/g	⊆	TRU alpha activity conc	<	900,000 nCi/g
29	900,000 nCi/g	⊆	TRU alpha activity conc	<	1,000,000 nCi/g
30	1,000,000 nCi/g	⊆	TRU alpha activity conc	<	2,500,000 nCi/g
31	2,500,000 nCi/g	⊆	TRU alpha activity conc	<	5,000,000 nCi/g
32	5,000,000 nCi/g	⊆	TRU alpha activity conc	<	7,500,000 nCi/g
33	7,500,000 nCi/g	⊆	TRU alpha activity conc	<	10,000,000 nCi/g
34	10,000,000 nCi/g	⊆	TRU alpha activity conc		

a. TRU alpha activity concentration per gross mass (nCi/g).

The term "gross mass" is defined as the net container mass plus mass of the waste within the container. In contrast, "waste mass" is defined as the mass of the waste in the container. Waste mass does not include the mass of the container. In cases where liners or other packaging materials have been used, the weight of these materials is considered part of the waste mass. For conversion from gross mass to waste mass, the following empty container weights are commonly used:

Drum (55 gal)	50 lbs (22.7 kg)
Box (4 × 4 × 7 ft)	620 lbs (281.2 kg)
Bin (4.2 × 4.9 × 6 ft)	676 lbs (306.6 kg)

A brief description of each column heading used in Section E is provided below.

Alpha Activity Concentration Profile

<i>Interval Number</i>	Transuranic alpha activity concentration interval from Table 3-2.
<i>TRU Alpha Activity Concentration</i>	TRU alpha activity concentration interval description.
<i>Interval Gross Mass (kg)</i>	The total gross mass within the specified interval.
<i>Interval Waste Mass (kg)</i>	The total waste mass within the specified interval.

Isotopic Composition Profile

<i>Major Nuclide/Pu Mix</i>	The major radionuclide(s) or plutonium mixture(s) reported present in the waste are identified. Radionuclides for which data are reported are shown in Table 2-1. Pu-52 and Pu-83 are database nomenclature for weapons-grade plutonium (WG Pu) and heat-source plutonium (HS Pu), respectively. The reader is referred to Section 2, Table 2-2 for the nominal isotopic compositions of these mixtures.
<i>Nuclide/Pu Mix Mass (g)</i>	The mass, in grams, of the radionuclide or plutonium mixture present.
<i>Nuclide/Pu Mix Mass per Gross Mass (g/g)</i>	The concentration of the radionuclide or plutonium mixture in the waste (in grams) per gram of gross mass. The term "gross mass" is defined as the net container mass plus mass of the waste within the container. In contrast, "waste mass" is defined as the mass of the waste in the container. Waste mass does not include the mass of the container.

<i>TRU Alpha Activity per Gross Mass (nCi/g)</i>	The transuranic alpha activity concentration in the waste in nanocuries per gram of gross mass.
<i>Non-TRU Alpha Activity per Gross Mass (nCi/g)</i>	The nontransuranic alpha activity concentration in the waste in nanocuries per gram of gross mass.
<i>Total Alpha Activity per Gross Mass (nCi/g)</i>	The sum of TRU alpha activity mass plus non-TRU alpha activity per gross mass.
<i>Nuclide/Pu Mix Mass per Waste Mass (g/g)</i>	The concentration of the radionuclide of plutonium mixture in the waste in grams per gram of waste mass.
<i>TRU Alpha Activity per Waste Mass (nCi/g)</i>	The transuranic alpha activity concentration in the waste in nanocuries per gram of waste mass.
<i>Non-TRU Alpha Activity per Waste Mass (nCi/g)</i>	The nontransuranic alpha activity concentration in the waste in nanocuries per gram of waste mass.
<i>Total Alpha Activity per Waste Mass (nCi/g)</i>	Sum of the TRU alpha activity per waste mass and non-TRU alpha activity per waste mass.

Sources from which the respective values were obtained are identified in the profile sheets. Complete citations for all references noted are in Section 8 of this report. Reference notation of 4-1,2,3 in the INEL Waste Profile Sheets refers to references 4-1, 4-2 and 4-3 in the References section of this report.

3.6 Section F: Design Basis Bulk Waste Materials

Section F contains physical and chemical composition information about the waste as derived from the IMWI database in the subreport entitled "Physical/Chemical Composition" and from additional compilation of data from Gale (1994)³⁻⁸ in the "Waste Matrix Constituents" subreports. For this subsection of Section F, the quantity and data type fields are blank if the amount of a component present is unknown. Fields listed in this section of the INEL Profile Sheet are:

Waste Matrix Constituents

<i>Major Category</i>	General category of combustibility.
<i>Minor Category</i>	Subgrouping of major category.
<i>Constituent</i>	Chemical constituent.
<i>Composition (wt%)</i>	The mass fraction of the chemical constituents thought to be present in the waste.
<i>Component</i>	Waste media or contaminant name.

<i>Quantity</i>	Quantity of <i>component</i> present.
<i>Units of Quantity</i>	Unit of measure for quantity.
<i>References</i>	References used to obtain reported data.

The constituent and quantity information represent best estimates of the waste matrix to date based on previous characterization and documentation and review of available process information.

Design basis estimates for more detailed chemical analysis for each constituent are presented in Tables 3-3, 3-4, and 3-5.³⁻⁸ Table 3-3 presents an estimate of chemical composition of the constituents defined in the profile sheets. Table 3-4 presents an additional detailed estimate of chemical composition based upon the inert fraction of constituents listed in Table 3-2. Table 3-5 presents an additional detailed estimate of chemical composition based upon each constituent defined in the profile sheets.

In addition, variable amounts of INEL RWMC soil may be included in any future retrieval efforts. The composition (in wt.%) of RWMC soil is SiO₂ (65.4%), Al₂O₃ (12.5%), FeO+Fe₂O₃ (4.8%), CaO (9.6%), MgO (2.5%), Na₂O (1.5%), K₂O (2.9%), and TiO₂ (0.7%)³⁻⁹.

3.7 INEL Profile Sheet Design Basis Information When No Other Waste Data or Information are Available

For some content codes, data are unavailable to complete all sections of the INEL Waste Profile Sheets. Lack of these data may be for several reasons, including incomplete historical records, or data needs (i.e., presence of RCRA constituents) identified after waste collection and storage records were completed many years ago. Until these wastes are further characterized, some of these data will remain unknown.

This section of the report has been prepared to provide the reader with base case waste characterization data for use when no known data for a profile sheet section are available. These base case data are designed for use in waste treatment feasibility studies or other instances where a complete set of waste characterization data for the ALLMW and ALLW are required. Use of these base case data will reduce assumptions or other conclusions drawn from an incomplete data set for these waste types.

An INEL Waste Profile Sheet with the INEL ID of "Design Basis" and Content Code designation of "ALLW" is provided in this report section. This design basis profile sheet provides a set of data and information considered "typical" of the INEL stored alpha low-level mixed waste and alpha low-level waste. The waste matrix/source characteristics of this design basis case are specified in a manner that reasonably approximates a significant fraction of the overall inventory population. For such design base case data to be reasonable, consideration must be given to nominal matrix compositions, source mass, and source compositions. This has been accounted for in the preparation of this design basis profile sheet data. The resultant source mass and waste

Table 3-3. Chemical composition of waste constituents of the waste stored in the TSA.³⁻⁸

Constituent	Wt% of waste constituent								
	Carbon	Hydrogen	Oxygen	Nitrogen	Sulfur	Chlorine	Fluorine	Water	Inert
Noncombustible									
Glass									
Glass Raschig rings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Other glass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Metals									
Carbon steel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Stainless steel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Aluminum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Tantalum 10W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Miscellaneous metal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
HVPM (Zn, Cd)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Miscellaneous Noncombustible									
Ceramic molds	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Firebrick	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	97.00
Concrete	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.72	91.28
Portland cement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	95.00
Dirt/soil (RFP)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	90.00
Ash	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Oil-Dri	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	95.00
Vermiculite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	95.00
Evap. salts—CC #5	0.85	0.13	0.00	0.00	0.00	0.00	0.00	0.13	98.88
Filters/Insulation									
Glass filter media	3.96	0.54	0.00	0.00	0.00	0.00	0.00	5.00	90.50
Asbestos filter media	3.96	0.54	0.00	0.00	0.00	0.00	0.00	5.00	90.50
Filter dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	90.00
Magnesia (insulation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	98.00
Inorganic Sludge									
Sludge—high Na ₂ O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.00	40.00
Sludge—high CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.00	40.00
Aqueous solutions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00

Table 3-3. (continued).

Constituent	Wt% of waste constituent								
	Carbon	Hydrogen	Oxygen	Nitrogen	Sulfur	Chlorine	Fluorine	Water	Inert
Partially Combustible									
Leaded rubber	33.16	4.47	1.01	0.28	0.51	0.00	0.00	0.00	60.56
Organic sludge	26.69	3.65	0.00	0.00	0.00	39.69	0.00	0.00	29.97
Uncemented resin	83.03	6.97	0.00	0.00	0.00	0.00	0.00	10.00	0.00
Cemented resins	27.68	2.32	0.00	0.00	0.00	0.00	0.00	20.00	50.00
Asphalt	4.294	0.49	0.05	0.05	0.12	0.00	0.00	0.00	95.01
Benelex/lead	33.20	3.53	25.19	0.00	0.03	0.00	0.00	3.35	34.70
Sheetrock	0.41	0.06	0.42	0.00	0.00	0.00	0.00	20.77	78.34
Combustibles									
Plastics									
Poly	84.93	13.40	0.35	0.11	0.02	0.00	0.00	0.00	1.19
PVC	47.38	5.73	9.09	0.00	0.01	35.72	0.00	0.00	2.07
Teflon	24.00	0.00	0.00	0.00	0.00	0.00	76.00	0.00	0.00
Plexiglas	59.99	8.05	31.96	0.00	0.00	0.00	0.00	0.00	0.00
Rubber									
Rubber	76.23	10.28	2.32	0.65	1.18	0.00	0.00	0.00	9.34
Surgeon's glove	76.23	10.28	2.32	0.65	1.18	0.00	0.00	0.00	9.34
Miscellaneous Combustibles									
Graphite	99.19	0.70	0.00	0.00	0.01	0.00	0.00	0.00	0.10
Paper	49.54	5.27	37.59	0.00	0.05	0.00	0.00	5.00	2.55
Wood	46.94	5.00	35.61	0.00	0.05	0.00	0.00	10.00	2.42
Cardboard	49.54	5.27	37.59	0.00	0.05	0.00	0.00	5.00	2.55
Cloth	49.54	5.27	37.59	0.00	0.05	0.00	0.00	5.00	2.55

Table 3-4. Chemical composition of the inert fraction of each waste constituent stored in the TSA (expressed as a fraction)

Constituent	Aluminum	Boron	Barium	Calcium	CaSO4	Cadmium	Carbon	Chromium	Copper	Gallium	Iron	Lead	Magnesium
Non-Combustible													
Glass													
Glass Raschig rings	0.00	12.80	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other glass	0.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metals													
Carbon steel	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	99.10	0.00	0.00
Stainless steel	0.00	0.00	0.00	0.00	0.00	0.00	0.03	19.00	0.00	0.00	71.97	0.00	0.00
Aluminum	98.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70
Tantalum 10W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Miscellaneous metal	30.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	10.00	0.00	50.00	1.00	2.00
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	99.90	0.00
HVPM (Zn, Cd)	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Miscellaneous Non-Combustible													
Ceramic molds	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	61.64
Firebrick	43.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Concrete	1.08	0.00	0.00	9.79	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.40
Portland cement	6.91	0.00	0.00	62.92	0.00	0.00	0.00	0.00	0.00	0.00	2.91	0.00	2.54
Dir/soil (RFP)	12.70	0.00	0.00	3.70	0.00	0.00	0.00	0.00	0.00	0.00	5.10	0.00	2.90
Ash	15.22	0.00	0.12	7.74	0.00	0.51	0.00	1.84	1.70	0.00	28.30	7.81	5.37
Oil-Dri	26.86	0.00	0.00	2.35	0.00	0.00	0.00	0.00	0.00	0.00	4.34	0.00	5.02
Vermiculite	19.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.30	0.00	17.98
Evap. salts—CC #5	1.93	0.00	0.00	2.47	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.45
Filters/Insulation													
Glass filter media	6.28	10.47	4.19	3.14	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	1.05
Asbestos filter media	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.16
Filter dust	12.70	0.00	0.00	3.70	0.00	0.00	0.00	0.00	0.00	0.00	5.10	0.00	2.90
Magnesia (insulation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Inorganic Sludge													
Sludge—high Na2O	8.34	0.00	0.00	4.80	0.00	0.00	0.00	0.10	0.17	5.51	6.52	0.64	5.20
Sludge—high CaO	4.31	0.00	0.00	22.61	0.00	0.00	0.00	0.04	0.18	0.08	5.84	0.31	10.55
Aqueous solutions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Partially Combustible													
Leaded rubber	0.07	0.00	0.00	1.39	0.00	0.00	0.00	0.00	0.09	0.00	0.07	93.20	0.42
Organic sludge	0.00	0.00	0.00	37.89	0.00	0.00	0.00	0.00	0.00	0.00	7.40	0.00	0.14
Uncemented resin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cemented resins	6.91	0.00	0.00	64.00	0.00	0.00	0.00	0.00	0.00	0.00	2.91	0.00	2.54
Asphalt	0.13	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.00	0.17
Benelex/lead	0.31	0.00	0.00	1.56	0.00	0.00	0.00	0.00	0.00	0.00	0.23	95.08	0.24
Sheetrock	0.06	0.00	0.00	0.31	99.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.05
Combustibles													
Plastics													
Poly	0.10	0.00	0.00	99.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
PVC	0.20	0.00	22.16	0.90	0.00	61.94	0.00	0.00	0.00	0.00	0.20	0.00	0.40
Teflon	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Plexiglas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber													
Rubber	1.00	0.00	0.00	20.70	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.10	6.20
Surgeons' glove	1.00	0.00	0.00	20.70	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.10	6.20
Miscellaneous Combustibles													
Graphite	15.00	0.00	0.00	7.10	0.00	0.00	0.00	0.00	0.00	0.00	17.30	0.00	2.30
Paper	6.31	0.00	0.00	31.79	0.00	0.00	0.00	0.00	0.00	0.00	4.58	0.00	4.97
Wood	6.31	0.00	0.00	31.79	0.00	0.00	0.00	0.00	0.00	0.00	4.58	0.00	4.97
Cardboard	6.31	0.00	0.00	31.79	0.00	0.00	0.00	0.00	0.00	0.00	4.58	0.00	4.97
Cloth	6.31	0.00	0.00	31.79	0.00	0.00	0.00	0.00	0.00	0.00	4.58	0.00	4.97

on of the inert chemicals).³⁻⁸

Wt% of inert fraction																
Manganese	Nickel	Phosphorus	Potassium	KNO3	Silicon	Sodium	NaNO3	Tantalum	Tin	Titanium	Tungsten	Vanadium	Zinc	SO3	Cl	CO2
0.00	0.00	0.00	0.00	0.00	62.20	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	70.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	38.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	52.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	87.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.17
0.00	0.00	0.00	0.00	0.00	21.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.72	0.00	1.08
0.00	0.00	0.00	3.10	0.00	70.70	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	1.13	0.10	0.38	0.04	23.13	1.33	0.08	0.00	0.17	0.18	0.00	0.00	3.58	0.33	0.01	0.79
0.00	0.00	0.00	0.50	0.00	60.68	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	20.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.30	28.49	8.54	0.17	56.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	2.09	0.00	59.32	10.99	0.00	0.00	0.00	0.00	0.00	0.00	2.36	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	78.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	3.10	0.00	70.70	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	4.46	0.00	36.09	28.14	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00
0.00	0.00	0.00	3.74	0.00	46.32	5.59	0.00	0.00	0.00	0.42	0.00	0.00	0.01	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.09	0.00	0.00	0.28	0.09	0.00	0.00	0.00	0.14	0.00	0.00	4.17	0.00	0.00	0.00
0.00	0.00	0.00	0.56	0.00	53.95	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	21.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.72	0.00	0.00
0.00	0.13	0.00	0.00	0.00	95.37	0.85	0.00	0.00	0.00	0.00	0.00	0.94	0.00	1.51	0.00	0.00
0.09	0.00	0.00	0.00	0.00	0.83	0.83	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.23	0.01	0.58
0.02	0.00	0.00	0.00	0.00	0.15	0.15	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.06	0.11
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.80	0.00	6.20	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.80	0.00	0.00	6.20	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	1.30	0.00	0.00	4.20	1.30	0.00	0.00	0.00	2.10	0.00	0.00	62.10	0.00	0.00	0.00
0.00	0.00	1.30	0.00	0.00	4.20	1.30	0.00	0.00	0.00	2.10	0.00	0.00	62.10	0.00	0.00	0.00
0.00	0.00	0.00	2.30	0.00	45.50	0.80	0.00	0.00	0.00	1.60	0.00	0.00	0.00	8.10	0.00	0.00
1.84	0.00	0.00	0.00	0.00	16.88	16.80	0.00	0.00	0.00	0.39	0.00	0.00	0.00	4.62	0.13	11.69
1.84	0.00	0.00	0.00	0.00	16.88	16.80	0.00	0.00	0.00	0.39	0.00	0.00	0.00	4.62	0.13	11.69
1.84	0.00	0.00	0.00	0.00	16.88	16.80	0.00	0.00	0.00	0.39	0.00	0.00	0.00	4.62	0.13	11.69
1.84	0.00	0.00	0.00	0.00	16.88	16.80	0.00	0.00	0.00	0.39	0.00	0.00	0.00	4.62	0.13	11.69

Table 3-5. Chemical composition of the inert fraction of each waste constituent stored in the TSA (expressed as a fraction)

Constituent	Aluminum	Boron	Barium	Calcium	CaSO ₄	Cadmium	Carbon	Chromium	Copper	Gallium	Iron	Lead	Magnesium
Non-Combustible													
Glass													
Glass Raschig rings	0.00	12.80	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other glass	0.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metals													
Carbon steel	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	99.10	0.00	0.00
Stainless steel	0.00	0.00	0.00	0.00	0.00	0.00	0.03	19.00	0.00	0.00	71.97	0.00	0.00
Aluminum	98.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70
Tantalum 10W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Miscellaneous metal	30.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	10.00	0.00	50.00	1.00	2.00
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	99.90	0.00
HVPM (Zn, Cd)	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Miscellaneous Non-Combustible													
Ceramic molds	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	61.64
Firebrick	41.71	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.97
Concrete	0.98	0.00	0.00	8.94	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.36
Portland cement	6.56	0.00	0.00	59.77	0.00	0.00	0.00	0.00	0.00	0.00	2.76	0.00	2.41
Dir/soil (RFP)	11.43	0.00	0.00	3.33	0.00	0.00	0.00	0.00	0.00	0.00	4.59	0.00	2.61
Ash	15.22	0.00	0.12	7.74	0.00	0.51	0.00	1.84	1.70	0.00	28.30	7.81	5.37
Oil-Dri	25.52	0.00	0.00	2.23	0.00	0.00	0.00	0.00	0.00	0.00	4.12	0.00	4.77
Vermiculite	18.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.24	0.00	17.08
Evap. salts—CC #5	1.90	0.00	0.00	2.44	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.44
Filters/Insulation													
Glass filter media	5.69	9.48	3.79	2.84	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.95
Asbestos filter media	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.15
Filter dust	11.43	0.00	0.00	3.33	0.00	0.00	0.00	0.00	0.00	0.00	4.59	0.00	2.61
Magnesia (insulation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	98.00
Inorganic Sludge													
Sludge—high Na ₂ O	3.34	0.00	0.00	1.92	0.00	0.00	0.00	0.04	0.07	2.20	2.61	0.26	2.08
Sludge—high CaO	1.72	0.00	0.00	9.04	0.00	0.00	0.00	0.02	0.07	0.03	2.34	0.12	4.22
Aqueous solutions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Partially Combustible													
Leaded rubber	0.04	0.00	0.00	0.84	0.00	0.00	0.00	0.00	0.06	0.00	0.04	56.45	0.25
Organic sludge	0.00	0.00	0.00	11.35	0.00	0.00	0.00	0.00	0.00	0.00	2.22	0.00	0.04
Uncemented resin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cemented resins	3.46	0.00	0.00	32.00	0.00	0.00	0.00	0.00	0.00	0.00	1.46	0.00	1.27
Asphalt	0.12	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.16
Benclex/lead	0.11	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.08	32.99	0.08
Sheetrock	0.05	0.00	0.00	0.24	77.56	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.04
Combustibles													
Plastics													
Poly	0.00	0.00	0.00	1.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PVC	0.00	0.00	0.46	0.02	0.00	1.28	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Teflon	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Plexiglas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber													
Rubber	0.09	0.00	0.00	1.93	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.01	0.58
Surgeons' glove	0.09	0.00	0.00	1.93	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.01	0.58
Miscellaneous Combustibles													
Graphite	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
Paper	0.16	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.13
Wood	0.15	0.00	0.00	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.12
Cardboard	0.16	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.13
Cloth	0.16	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.13

n of the total constituent chemicals).³⁻⁸

Wt% of inert fraction

Manganese	Nickel	Phosphorus	Potassium	KNO3	Silicon	Sodium	NaNO3	Tantalum	Tin	Titanium	Tungsten	Vanadium	Zinc	SO3	Cl	CO2
0.00	0.00	0.00	0.00	0.00	62.20	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	70.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	38.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	50.44	0.00	0.00	0.00	0.00	1.94	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	80.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.15
0.00	0.00	0.00	0.00	0.00	20.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63	0.00	1.03
0.00	0.00	0.00	2.79	0.00	63.63	1.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	1.13	0.10	0.38	0.04	23.13	1.33	0.08	0.00	0.17	0.18	0.00	0.00	3.58	0.33	0.01	0.79
0.00	0.00	0.00	0.48	0.00	57.65	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	19.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.30	28.17	8.44	0.17	56.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	1.90	0.00	53.68	9.95	0.00	0.00	0.00	0.00	0.00	0.00	2.13	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	71.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	2.79	0.00	63.63	1.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	1.78	0.00	14.44	11.26	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	1.50	0.00	18.53	2.24	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.05	0.00	0.00	0.17	0.05	0.00	0.00	0.00	0.09	0.00	0.00	2.52	0.00	0.00	0.00
0.00	0.00	0.00	0.17	0.00	16.17	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	10.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.86	0.00	0.00
0.00	0.12	0.00	0.00	0.00	90.61	0.81	0.00	0.00	0.00	0.00	0.00	0.89	0.00	1.43	0.00	0.00
0.03	0.00	0.00	0.00	0.00	0.29	0.29	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.08	0.00	0.20
0.01	0.00	0.00	0.00	0.00	0.12	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.05	0.08
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.02	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.13	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.12	0.00	0.00	0.39	0.12	0.00	0.00	0.00	0.20	0.00	0.00	5.80	0.00	0.00	0.00
0.00	0.00	0.12	0.00	0.00	0.39	0.12	0.00	0.00	0.00	0.20	0.00	0.00	5.80	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.43	0.43	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.12	0.00	0.30
0.04	0.00	0.00	0.00	0.00	0.41	0.41	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.11	0.00	0.28
0.05	0.00	0.00	0.00	0.00	0.43	0.43	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.12	0.00	0.30
0.05	0.00	0.00	0.00	0.00	0.43	0.43	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.12	0.00	0.30

concentration data to be applied to empty record cases is reasonable in terms of the actual characteristics of the INEL alpha low-level stored wastes.

The design case data presented in this report are based on a typical solidified waste form. Values are based on one 55-gallon sludge drum weighing 475 lbs (216 kg) gross mass, 400 lbs (182 kg) waste mass. The source composition of the sludge is comprised of a nominal WG Pu composition at 15 years post purification at a mass per container of 0.2 grams. In addition, the sludge contains a mixture of RCRA hazardous constituents, primarily organic chemicals. Design base case data are presented in the following profile sheet.

Profile sheets contained in Sections 4 and 5 and for which data are not available will direct the reader back to this design base case profile sheet. It is suggested that the values in this base case profile sheet be used only with those profile sheets where no data are available. Some examples of how to use the Design Basis Profile Sheet data are shown below.

Example 1: The INEL Waste Profile Sheet ID-EGG-288-155 does not report hazardous constituent data under Section D.

In this instance, the reader is referred to Section D of the Design Basis Profile Sheet (DES-BASIS-ALLW) on page 3-4. In this profile sheet, a listing of eight EPA Hazardous Waste Codes and associated data are provided. These data include an estimated concentration (mg/kg) and assumed maximum concentration (mg/kg) for each of these constituents.

To complete the waste characterization data in INEL Waste Profile Sheet ID-EGG-288-155, the reader should use the chemical constituents, estimated constituent concentrations, and assumed maximum constituent concentrations provided in DES-BASIS-ALLW.

The methanol mass in ID-EGG-288-155 must be normalized to the respective Design Basis Case methanol concentration, DES-BASIS-ALLW, in order to determine the total mass of methanol in ID-EGG-288-155. This normalization and calculation of the methanol mass in ID-EGG-288-155 is determined as follows:

$$\text{DES-BASIS-ALLW Methanol Conc} \times \text{Gross Mass ID-EGG-288-155} = \text{Mass Methanol in ID-EGG-288-155} \quad (3-1)$$

$$30 \frac{\text{mg}}{\text{kg}} \times 828 \text{ kg} = 24,840 \text{ mg methanol} \quad (3-2)$$

This process is to be implemented for the remaining chemical constituents of interest.

Example 2: The INEL Waste Profile Sheet ID-EGG-118-328 does not report alpha activity concentration or isotopic composition data under Section E.

In this instance, the reader is referred to Section E of the Design Basis Profile Sheet (DES-BASIS-ALLW) on page 3-7. In this profile sheet, one radionuclide mixture (Pu-52, weapons-grade plutonium) is identified. The TRU and non-TRU alpha activity

concentration data for this contaminant are also provided using both a gross mass (216 kg) and waste mass (182 kg).

To complete the waste characterization data in INEL Waste Profile Sheet ID-EGG-188-328, the reader should use the design basis radionuclide mixture, Pu-52. To determine the mass of Pu-52 in ID-EGG-188-328, the Pu Mix Mass/Gross Mass concentration in ID-EGG-188-328 must be normalized to the respective Design Basis Case concentration, DES-BASIS-ALLW. This normalization and determination of the associated mass of Pu-52 in ID-EGG-188-328 is done as follows:

$$\text{Design Basis Pu-52 concentration} = \frac{\text{Mass of Pu-52 in DES-BASIS-ALLW}}{\text{Gross Mass in DES-BASIS-ALLW}} \quad (3-3)$$

$$\text{Design Basis Pu-52 concentration} \times \text{Gross Mass ID-EGG-188-328} = \text{Pu-52 mass in ID-EGG-188-328} \quad (3-4)$$

In this example,

$$\text{Design Basis Pu-52 concentration} = \frac{0.2 \text{ g Pu-52}}{216,000 \text{ g Gross Mass}} \quad (3-5)$$

$$\text{Design Basis Pu-52 concentration} = 9.27\text{E}-07 \frac{\text{g Pu-52}}{\text{g Gross Mass}} \quad (3-6)$$

$$9.27\text{E}-07 \frac{\text{g Pu-52}}{\text{g Gross Mass}} \times 78,000 \text{ g Gross Mass} = 0.0702 \text{ g Pu-52 in ID-EGG-188-328} \quad (3-7)$$

Therefore the total alpha activity for ID-EGG-188-328 would be estimated as 5.74E+06 nanoCuries by the following equation.

$$0.072 \text{ g Pu-52} \times 7.977\text{E}-02 \frac{\text{Ci}}{\text{g Pu-52}} \times 1.0\text{E}+09 \frac{\text{nCi}}{\text{Ci}} = 5.74\text{E}+06 \text{ nCi TRU } \alpha \text{ activity} \quad (3-8)$$

To obtain the TRU alpha activity concentration, the TRU alpha activity computed above is divided by the gross mass in ID-EGG-188-328 as shown below. The conversion factor used to convert Pu-52 mass to TRU alpha activity (in Ci) is found in Table 2-2.

$$\frac{5.74\text{E}+06}{78,000} \frac{\text{nCi TRU } \alpha \text{ activity}}{\text{g Gross Mass ID-EGG-188-328}} = 73.6 \frac{\text{nCi}}{\text{g Gross Mass}} \quad (3-9)$$

The non-TRU alpha activity per gross mass, TRU alpha activity per waste mass, and non-TRU alpha activity per waste mass are determined in a similar manner. Since the gross mass is the same, the total alpha activity per gross mass is determined by summing the TRU alpha activity per gross mass and the non-TRU alpha activity per gross mass. A parallel calculation is performed for the total alpha activity per waste mass.

Example 3: The INEL Waste Profile Sheet ID-EGG-287-0 does not report Waste Matrix Constituents data under Section F.

In this instance, the reader is referred to Section F of the Design Basis Profile Sheet (ID-DES-BASIS-ALLW) on page 3-10. In this profile sheet, an estimated typical matrix composition for a sludge drum is presented.

To complete the waste matrix constituent characterization data in INEL Waste Profile Sheet ID-EGG-287-0, the reader should use the mass fraction data presented in ID-DES-BASIS-ALLW, Section F. For example, to compute the total mass of a given constituent in ID-EGG-287-0, the reader should multiply the respective DES-BASIS-ALLW Composition (wt%) value by the gross mass in ID-EGG-287-0. To illustrate:

$$\text{Mass Oil-dri in ID-EGG-287-0} = \text{Wt\% Oil-dri in DES-BASIS-ALLW} \times \text{Gross Mass in ID-EGG-287-0} \quad (3-10)$$

$$600 \text{ kg Oil-dri} = 1.0 \text{ Wt\%} \times 60,000 \text{ kg} \quad (3-11)$$

Note: This method will yield a rough estimate acceptable for use when no data are available. For the profile sheets that contain composition data, the mass of the container and any liner is *not* included in the wt% breakdown.

21-Mar-94

INEL Waste Profile Sheet

ALLMW

DES-BASIS-ALLW

A. IDENTIFICATION

INEL ID/Name: DES-BASIS

N/A

C. Code/Name: ALLW

Default Design Basis Information For Alpha Low Level Waste
(Mixed or Non-mixed)**B. DESCRIPTION**

INEL ID (WMIS) Description:

N/A

Total Volume (m3): .21

Gross Mass (kg): 215.46

Drum Equivalents: 1.00

Physical Form: SOLID

Physical Type: SLUDGE

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☒ Partially Combustible (10%-90%)☐ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This Waste ID and Content Code represent a design basis set of information for the alpha low level (mixed or non-mixed) waste considered typical and for use when no other information is available.

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21-Mar-94

INEL Waste Profile Sheet

ALLMW

DES-BASIS-ALLW

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	DM	0.21	215.46	
Subtotal	1	0.21	215.46	

Total	1	.21 m3	215.46 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volume.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID		5.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	2.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	5.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	50.000	100.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	1.000	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1	30	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3	10	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	50	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	2.16E+02	1.82E+02
Totals		2.16E+02	1.82E+02

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	2.00E-01	9.27E-07	7.40E+01	3.89E-03	7.40E+01	1.10E-06	8.78E+01	4.62E-03	8.79E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTSPHYSICAL/CHEMICAL COMPOSITION

When no data are available, please refer to Section 3.7 of this report.

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	1.0
		Vermiculite	0.3
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	97.6
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	0.9
		Polyvinyl Chloride (PVC)	0.2
		Teflon	
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

3.8 References

- 3-1. Idaho Mixed Waste Information (IMWI) Database, EG&G Idaho, Inc. January 1994.
- 3-2. Federal Facility Compliance Act of 1992 as amended, (Public Law 102-386).
- 3-3. Waste Management Information System, Oak Ridge National Laboratory, U.S. Department of Energy.
- 3-4. U.S. Department of Energy Order 5820.2A, "Radioactive Waste Management," Office of Defense Waste and Transportation Management, U.S. Department of Energy, Washington, D.C., September 26, 1988.
- 3-5. Code of Federal Regulations, Title 40, "Protection of the Environment," Office of the Federal Register National Archives and Records Administration, July 1, 1991.
- 3-6. Raivo, B. D. and D. P. Pace, *Preliminary EPA Hazardous Constituents Design Basis Concentration for a-LLW Treatment Services*, EDF PSPI-015546-04, January 18, 1994.
- 3-7. *Statement of Work for a Feasibility Study on Treatment Services for Alpha-Contaminated Mixed Low-Level Waste*, Idaho National Engineering Laboratory, DOE-ID, RFP No. DE-RP07-94ID13278, December 1993.
- 3-8. Gale, L. G., *Estimated Waste Matrix Composition of ALLW for Treatment Design Basis*, EDF IWPF-0047, February 1994.
- 3-9. Reimann, G. A, J. D. Grandy, T. L. Eddy, and G. L. Anderson, *Summary of INEL Research on the Iron-Enriched Basalt Waste Form*, EGG-WTD-10056, January 1992.

4. ALPHA LOW-LEVEL MIXED WASTE PROFILE SHEETS

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102

UNCEMENTED INORGANIC SLUDGE (a-LLW)

C. Code/Name: 1

FIRST STAGE SLUDGE

B. DESCRIPTION

INEL ID (WMIS) Description:

Miscellaneous inorganic setups.

Total Volume (m3): 58.93

Gross Mass (kg): 57,810.00

Drum Equivalents: 277.95

Physical Form: SOLID

Physical Type: SLUDGE, ABSORBENT MATERIALS

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant (RFP), consists of combined first and second stage sludge. Sludges were combined starting in 1979 to reduce the radiation levels of first stage sludge. Portland cement was added to absorb free liquids.

The drums may be uncertifiable because the containers contain free liquids. Although the organic content should be less than 14 lb/ft³, there is still potential for gas generation. The waste is amorphous, semisolid sludge containing 50-70 weight percent water. Added cement dust does not contribute to the excess fines evaluation. No explosive, pyrophoric, or corrosive materials should be in the waste. Beryllium (P015) has been found in concentrations ranging to 1000 ppm.

The sludge is double-contained in an O-ring bag and a plastic bag, and placed inside 55 gallon drums. The drums are lined with 90 mil drum liners. Portland cement is placed in the bottom of each bag and the drum liner, and on top of the plastic bag. After 1982, cement was also placed on top of the sludge, and vermiculite instead of Oil-dri was placed on top of the outer sealed PE (polyethylene) drum bag. Up to 50 lb of added cement are in each drum. Assays for each drum were determined by averaging the weekly quantity of TRU material in the liquid waste by the number of sludge drums generated in that week.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-102-1

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	INSERT	0.21	210.00	FIRST STAGE SLUDGE
262	DRUM	55.54	56,000.00	FIRST STAGE SLUDGE
1	BOX	3.17	1,600.00	FIRST STAGE SLUDGE
Subtotal	264	58.93	57,810.00	

Total	264	58.93 m3	57,810.00 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID			10.000
D005	BARIUM	.	7440-39-3		10.000
D006	CADMIUM	.	7440-43-9	10	10.000
D007	CHROMIUM	.	7440-47-32		10.000
D008	LEAD	.	7439-92-1	10	10.000
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		260
D011	SILVER	.	7440-22-4		10.000
D022	CHLOROFORM	.	67-66-3		10.000
D028	1,2-DICHLOROETHANE	.	107-06-2		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	75	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	25	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	700	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1	25	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3	10	10.000
F033	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	50	10.000
P015	BERYLLIUM DUST	.	7440-41-7	1.000	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	8.30E+03	7.30E+03
Totals		8.30E+03	7.30E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	5.51E+00	6.66E-07	5.32E+01	2.80E-03	5.32E+01	7.54E-07	6.02E+01	3.16E-03	6.02E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	0.6
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	4.7
		Dirt/Soil	
		Ash	
		Oil-dn	0.5
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
	Inorganic Sludge -	Magnesia (insulations)	
		Sludge High Na2O (1st Stage)	46.5
		Sludge High CaO (2nd Stage)	46.5
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	0.9
		Polyvinyl Chloride (PVC)	0.2
		Teflon	0.0
<u>Combustibles</u> (>90% Combustible)	Rubber -	Plexiglass	
		Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)			4-1
ABSORBENT (PORTLAND CEMENT)	50	LBS/DRUM	4-1
ABSORBENT (VERMICULITE)			4-1
BERYLLIUM	1000	PPM	4-1
ORGANICS	14	LB/FT3	4-1, 2
SLUDGE			4-1, 2
WATER	50-70	% WT	4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102

UNCEMENTED INORGANIC SLUDGE (a-LLW)

C. Code/Name: 2

SECOND STAGE SLUDGE

B. DESCRIPTION

INEL ID (WMIS) Description:

Miscellaneous inorganic setups.

Total Volume (m3): 342.38

Gross Mass (kg): 410,000.03

Drum Equivalents: 1,615.00

Physical Form: SOLID

Physical Type: SLUDGE, CONTAMINATED EQUIPMENT, GLASS

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant, consists of wet sludge from treatment of all other plant radioactive and/or chemical contaminated wastes, and further treatment of the first stage effluent. Some pre-1973 waste may include non-sludge wastes such as electric motors, mercury and lithium batteries, bottles of liquid chemicals, and small amounts of mercury in pint bottles. Portland cement was added to absorb free liquids.

The drums may be uncertifiable (for WIPP) because the containers contain free liquids. Although the organic content should be less than 14 lb/ft³, there is still potential for gas generation. The waste is an amorphous, semisolid sludge containing 50-70 weight percent water. Added cement dust does not contribute to the excess fines evaluation. No free liquids should be present, but drums packaged before 1973 may contain bottles of liquid chemical wastes. No explosive, pyrophoric, or corrosive materials should be in the waste.

Drums are prepared according to pre and post-1972 procedures. The sludge is double-contained in an O-ring bag and plastic bag, and placed inside prepared 55 gallon drums. Portland cement is placed in the bottom of each bag (and the drum liner after 1972), on top of the plastic bag. Cement is also layered with the sludge as the container was filled. After 1982, cement was also placed on top of the sludge, and vermiculite instead of Oil-Dri was placed on top of the outer sealed PE drum bag. Up to 50 lb of added cement are in each drum. Assays for each drum were determined by analyzing a composite sample from all drums generated during each day.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

AIM

Association for Information and Image Management

1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910
301/587-8202

Centimeter

Inches

MANUFACTURED TO AIM STANDARDS
BY APPLIED IMAGE, INC.

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INEL Waste Profile Sheet

ALLMW

ID-EGG-102-2

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	1615	DRUM	342.38	410,000.03	SECOND STAGE SLUDGE
Subtotal	1615		342.38	410,000.03	

Total	1,615	342.38 m3	410,000.03 kg
--------------	--------------	------------------	----------------------

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID			10.000
D003	REACTIVE	OTHER REACTIVES			10.000
D005	BARIUM	.	7440-39-3		10.000
D006	CADMIUM	.	7440-43-9	10	10.000
D007	CHROMIUM	.	7440-47-32		10.000
D008	LEAD	.	7439-92-1	10	10.000
D009	MERCURY	ELEMENTAL MERCURY CONTAMINATED WITH RADIOACTIVE MATERIALS	7439-97-6	25.000	200.000
D009	MERCUF.	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		260
D011	SILVER	.	7440-22-4		10.000
D022	CHLOROFORM	.	67-66-3		10.000
D028	1,2-DICHLOROETHANE	.	107-06-2		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	75	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	25	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	700	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1	25	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3	10	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	50	10.000
P015	BERYLLIUM DUST	.	7440-41-7	1.000	10.000
	LITHIUM		7439-93-2	25.000	200.000

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INEL Waste Profile Sheet

ALLMW

ID-EGG-102-2

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	6.80E+05	6.20E+05
Totals		6.80E+05	6.20E+05

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	6.98E+02	1.02E-06	8.14E+01	4.28E-03	8.14E+01	1.13E-06	9.02E+01	4.75E-03	9.02E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	3.9
		Dirt/Soil	
		Ash	
		Oil-dri	
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	91.9
		Aqueous Solutions	3.8
		Leaded Rubber	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	0.3
		Polyvinyl Chloride (PVC)	0.1
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	0.0
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (PORTLAND CEMENT)	50	LBS/DRUM	4-1, 2
METAL (ELECTRIC MOTORS)			4-1, 2
ORGANICS	14	LB/FT ³	4-1
OTHER (MERCURY & LITHIUM BATTERY)			4-1, 2
SLUDGE			4-1, 2
WATER	50-70	% WT	4-1

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INEL Waste Profile Sheet

ALLMW

ID-EGG-102-2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102

UNCEMENTED INORGANIC SLUDGE (a-LLW)

C. Code/Name: 7

BLDG 374 DRY SLUDGE

B. DESCRIPTION**INEL ID (WMIS) Description:**

Miscellaneous inorganic setups.

Total Volume (m3): 464.28

Gross Mass (kg): 480,000.03

Drum Equivalents: 2,190.00

Physical Form: SOLID

Physical Type: SLUDGE

F.Bs: ☐**Combustibility:**☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)**Waste Type**☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW**Rad. Level**☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

There is no content information for this code, except that the waste stream was generated at the Rocky Flats Plant in Building 374 and it is a dry sludge.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-102-7

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	2190	DRUM	464.28	480,000.03	BLDG 374 DRY SLUDGE
Subtotal	2190		464.28	480,000.03	

Total 2,190**464.28 m3****480,000.03 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID			10.000
D006	CADMIUM		7440-43-9	10	10.000
D007	CHROMIUM		7440-47-32		10.000
D008	LEAD		7439-92-1	10	10.000
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		260
D022	CHLOROFORM		67-66-3		10.000
D028	1,2-DICHLOROETHANE		107-06-2		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	75	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	25	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	700	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1	25	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3	10	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	50	10.000
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		10.000
P015	BERYLLIUM DUST		7440-41-7	1.000	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.10E+05	9.50E+04
Totals		1.10E+05	9.50E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
AM-241	1.28E-02	1.24E-10	4.16E-01	7.45E-11	4.16E-01	1.38E-10	4.63E-01	8.30E-11	4.63E-01
PU-52	7.72E+01	7.31E-07	5.83E+01	3.07E-03	5.83E+01	8.15E-07	6.50E+01	3.42E-03	6.50E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)	
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings		
		Other Glass		
	Metals -	Carbon Steel		
		Stainless Steel		
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal		
		Lead (Bulk Pb)		
		Other HVPM(Zn,Cd)		
	Misc. Non-Combustible -	Ceramic (molds)		
		Firebrick		
		Concrete		
		Portland Cement	0.1	
		Dirt/Soil		
		Ash		
		Oil-dri	3.0	
		Vermiculite	10.9	
		Salts		
		Filters/Insulation -	Glass Filter Media	
	Asbestos (filter, insulation)			
	Filter Dust			
	Inorganic Sludge -	Magnesia (insulations)		
		Sludge High Na2O (1st Stage)	42.3	
		Sludge High CaO (2nd Stage)	42.3	
	<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Aqueous Solutions	
			Leaded Rubber	
Organic Sludge				
Uncemented Resin				
Cemented Resin				
Asphalt				
Benelex/lead				
Sheetrock				
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	1.1	
		Polyvinyl Chloride (PVC)	0.3	
		Teflon	0.0	
	Rubber -	Plexiglass		
		Rubber		
	Misc. Combustibles -	Surgeons' Glove		
		Graphite (molds)		
		Paper		
		Wood		
Cardboard				
	Cloth			

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
SLUDGE			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-

UNCEMENTED INORGANIC SLUDGE (a-LLW)

C. Code/Name: 30

SOLIDIFIED GRINDING SLUDGE, ETC.

B. DESCRIPTION

INEL ID (WMIS) Description:

Miscellaneous inorganic setups.

Total Volume (m3): .42

Gross Mass (kg): 560.00

Drum Equivalents: 2.00

Physical Form: SOLID

Physical Type: OTHER

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☐ Contact-Handled ☒ Remote-Handled**Content Code Description:**

This waste stream, generated at Bettis Atomic Power Laboratory, consists of solidified grinding sludge and associated filters, rags, etc. The sludge can contain abraded grinding wheel material, which includes diamond dust, aluminum oxide, carborundum, and rubber. The waste is in either powder or cakes, and contains not more than 10% of other waste items.

The waste is uncertifiable (for WIPP) due to the high levels of fines. In addition the drums may be uncertifiable because the containers contain free liquids. The potential for gas generation is low since the estimated organic content is less than 1 lb/ft³. No particle size data is provided, but it is assumed that WIPP-WAC limits for fines would be exceeded. No free liquids should be present. No explosive, pyrophoric, or corrosive material should be in the waste.

Both 17c and 6m 55-gallon drums were used for packaging the waste. Fissile content was determined by calculating the weight difference by chemical analysis or by an assay gauge.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-102-30

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	2	INSERT	0.42	560.00	SOLIDIFIED GRINDING SLUDGE, ETC.
Subtotal	2		0.42	560.00	

Total 2**.42 m3****560.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10,000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	100	10,000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	5.50E+03	4.40E+03
Totals		5.50E+03	4.40E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	1.56E-01	2.78E-07	1.72E+01	2.30E-07	1.72E+01	2.78E-07	1.72E+01	2.30E-07	1.72E+01
TH-232	1.07E+06	2.18E-01	0.00E+00	6.06E+01	6.06E+01	2.77E-01	0.00E+00	7.69E+01	7.69E+01
U-233	6.14E+03	1.12E-03	0.00E+00	1.08E+04	1.08E+04	1.38E-03	0.00E+00	1.34E+04	1.34E+04

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	7.0
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM (Zn, Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dn	
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
	Inorganic Sludge -	Magnesia (insulations)	
		Sludge High Na ₂ O (1st Stage)	37.0
		Sludge High CaO (2nd Stage)	37.0
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	5.6
		Polyvinyl Chloride (PVC)	1.4
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	1.0
		Wood	10.0
		Cardboard	
		Cloth	1.0

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
FILTERS			4-1
ORGANICS	1	LB/FT ³	4-1
RAGS			4-1
SLUDGE (ABRADED GRINDING MATL, ALUMINUM OXIDE)			4-1
SLUDGE (DIAMOND DUST, CARBORUNDUM, RUBBER)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102

UNCEMENTED INORGANIC SLUDGE (a-LLW)

C. Code/Name: 111

WIPP PRECERTIFIED RGW NONCOMPACTIBLE SOLIDS
OR CERTIFIED SOLIDS WET SLUDGE**B. DESCRIPTION****INEL ID (WMIS) Description:**

Miscellaneous inorganic setups.

Total Volume (m3): 285.33

Gross Mass (kg): 291,600.02

Drum Equivalents: 1,345.91

Physical Form: SOLID

Physical Type: SLUDGE, SOIL, CONTAMINATED EQUIPMENT

PCBs: ☐**Combustibility:**

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW**Rad Level**☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste includes waste generated at ANL-East and certified solid wet sludge from the Rocky Flats Plant. The ANL-E waste is derived from research activities performed in a laboratory environment. The waste includes concrete and laboratory apparatus. The waste is packaged in 55-gallon drums or in SWBs (standard waste boxes). Hazardous materials expected in the stream include cadmium (EP Toxic, Waste Code D006) and lead (EP Toxic, Waste Code D008).

The certified (for WIPP) solid wet sludge is cemented or dewatered sludge precipitated from aqueous waste treatment processes. Soils that are not contaminated with organic chemicals are also included. Content codes certified and renamed 111 include 1,2,7, 976, and 978.

(RGW: research generated waste)

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-102-111

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	1316	DRUM	278.99	290,000.02	WIPP PRECERTIFIED RGW NONCOMPACTIBLE SOLIDS OR CERT
	2	BOX	6.34	1,600.00	WIPP PRECERTIFIED RGW NONCOMPACTIBLE SOLIDS OR CERT
Subtotal	1318		285.33	291,600.02	

Total 1,318**285.33 m3****291,600.02 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID			10.000
D004	ARSENIC		7440-38-2		10.000
D005	BARIUM		7440-39-3		10.000
D006	CADMIUM		7440-43-9	10.000	10.000
D007	CHROMIUM		7440-47-32		10.000
D008	LEAD		7439-92-1	10.000	10.000
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	10.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	10.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	10.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4	10.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6	10.000	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	10.000	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	ETHYL BENZENE	100-41-4	10	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1	10.000	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3	10.000	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	10.000	10.000
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3	10	10.000
P015	BERYLLIUM DUST		7440-41-7	10.000	10.000
D028	1,2-DICHLOROETHANE		107-6-2	1.000	10.000
D022	CHLOROFORM		67-66-3	1.000	10.000
D003	SODIUM CHROMATE		7775-11-3	10.000	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	4.00E+04	3.40E+04
Totals		4.00E+04	3.40E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
AM-241	2.03E-01	1.21E-08	4.06E+01	7.27E-09	4.06E+01	1.42E-08	4.75E+01	8.51E-09	4.75E+01
PU-239	1.00E-02	1.45E-07	8.99E+00	1.20E-07	8.99E+00	2.16E-07	1.34E+01	1.79E-07	1.34E+01
PU-52	2.63E+01	6.58E-07	5.25E+01	2.76E-03	5.25E+01	7.83E-07	6.24E+01	3.28E-03	6.24E+01
U-233	1.43E+00	2.07E-05	0.00E+00	2.01E+02	2.01E+02	3.09E-05	0.00E+00	2.99E+02	2.99E+02
U-235	6.70E+01	4.30E-05	0.00E+00	8.26E-02	8.26E-02	5.96E-05	0.00E+00	1.15E-01	1.15E-01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

When no data are available, please refer to Section 3.7 of this report.

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
1,1,1-TRICHLOROETHANE (TCA)	1	% WT	4-1, 2, 7
1,1,2,2-TETRACHLOROETHANE	0.1	% WT	4-7
1,1,2-TRICHLORO 1,2,2-TRIFLUOROETHANE (FREON)	1	% WT	4-1, 2, 7
1,2-DICHLOROETHENE	0.1	% WT	4-7
ABSORBENT (PORTLAND CEMENT)	50	LBS/DRUM	4-1
ABSORBENT (VERMICULITE)	50	LBS/DRUM	4-1
BERYLLIUM	1	% WT	4-7
BUTYL ALCOHOL	1	% WT	4-1, 2, 7
CADMIUM	1	% WT	4-1, 2, 7
CARBON TETRACHLORIDE	1	% WT	4-1, 2, 7
CHLOROFORM	0.1	% WT	4-7
ETHYL BENZENE	FEW	PPM BY WT	4-7
LEAD	1	% WT	4-1, 2, 7
MERCURY	1	% WT	4-7
METHYL ALCOHOL	1	% WT	4-1, 2, 7
METHYLENE CHLORIDE	1	% WT	4-1, 2, 7
OTHER (LABORATORY APPARATUS)			4-1
SLUDGE (CEMENTED OR DEWATERED)			4-1
SODIUM CHROMATE	1	% WT	4-7
SOIL			4-1
TETRACHLOROETHYLENE (PERCLEN)	1	% WT	4-7
TOLUENE	FEW	PPM BY WT	4-7
TRICHLOROETHYLENE (TCE)	1	% WT	4-7
XYLENE	1	% WT	4-1, 2, 7

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102

UNCEMENTED INORGANIC SLUDGE (a-LLW)

C. Code/Name: 113

CERTIFIED SOLID LAB WASTE

B. DESCRIPTION

INEL ID (WMIS) Description:

Miscellaneous inorganic setups.

Content Code Description:

Certified solid lab waste consists of cemented or absorbed neutralized aqueous laboratory waste.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

Total Volume (m3): 2.54

Gross Mass (kg): 3,600.00

Drum Equivalents: 12.00

Physical Form: SOLID

Physical Type: ABSORBENT MATERIALS, OTHER

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-102-113

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	12	DRUM	2.54	3,600.00	CERTIFIED SOLID LAB WASTE
Subtotal	12		2.54	3,600.00	

Total 12**2.54 m3****3,600.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID			10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCvg < 100	3.60E+03	3.20E+03
Totals		3.60E+03	3.20E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	6.92E-01	1.93E-07	1.54E+01	8.10E-04	1.54E+01	2.15E-07	1.72E+01	9.02E-04	1.72E+01

F. Design Basis Bulk Waste Materials**WASTE MATRIX CONSTITUENTS****PHYSICAL/CHEMICAL COMPOSITION**

When no data are available, please refer to Section 3.7 of this report.

Component	Conc.	Units of Conc.	Ref.
ABSORBENT			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102

UNCEMENTED INORGANIC SLUDGE (a-LLW)

C. Code/Name: 292

CEMENTED SLUDGE

B. DESCRIPTION**INEL ID (WMIS) Description:**

Miscellaneous inorganic setups.

Total Volume (m3): 4.88

Gross Mass (kg): 2,914.00

Drum Equivalents: 23.00

Physical Form: SOLID

Physical Type: SLUDGE, RUBBER

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream, generated at Rocky Flats Plant, consists of sludge from the incinerator off-gas system, recovery building filter plenums, pumps, etc. Portland cement is added to absorb free liquids. The sludge may contain a limited number of surgical gloves. Content code 292 replaced code 290 in 1974.

The drums may be uncertifiable (for WIPP) because the containers contain free liquids. Organic content is less than 14 lb/ft³, and gas generation should be minimal. Particulate fines, which do not include cement, should be within acceptance limits. No explosive, pyrophoric, or corrosive materials should be in the waste.

Before 1977, sludge was sealed in PVC bags, double-contained in plastic and placed in 1-gallon metal paint cans. Portland cement was added to the bottom and top of the can. After 1977, sludge was placed in 1-gallon PE bottles with layers of Portland cement. Each can (or bottle) was assayed and placed in groups of about 25 into prepared 55-gallon drums. Drum preparation was in accordance with pre and post 1972 procedures. Starting in 1982, vermiculite replaced Oil-Dri as the material placed between the top of the waste material and the drum liner lid.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-102-292

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	23	DRUM	4.88	2,914.00	CEMENTED SLUDGE
Subtotal	23		4.88	2,914.00	

Total 23**4.88 m3****2,914.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID			10.000
D006	CADMIUM		7440-43-9	10	10.000
D008	LEAD		7439-92-1	10	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	20	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	20	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	15	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	5	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1	5	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3	5	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	10	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.40E+03	1.20E+03
Totals		1.40E+03	1.20E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass per Gross Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	2.58E-01	1.87E-07	1.49E+01	7.83E-04	1.49E+01	2.08E-07	1.66E+01	8.74E-04	1.66E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)	
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings		
		Other Glass		
	Metals -	Carbon Steel		
		Stainless Steel		
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal	0.0	
		Lead (Bulk Pb)		
		Other HVPM(Zn,Cd)	0.0	
	Misc. Non-Combustible -	Ceramic (molds)		
		Firebrick		
		Concrete		
		Portland Cement		
		Dirt/Soil		
		Ash		
		Oil-dn	1.5	
		Vermiculite	1.7	
		Salts		
		Filters/Insulation -	Glass Filter Media	
Asbestos (filter, insulation)				
Filter Dust				
Magnesia (insulations)				
Inorganic Sludge -	Sludge High Na2O (1st Stage)	42.0		
	Sludge High CaO (2nd Stage)	42.0		
	Aqueous Solutions			
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber		
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benalex/lead		
		Sheetrock		
		Plastics -	Polyethylene	9.7
			Polyvinyl Chloride (PVC)	2.4
Teflon	0.0			
Plexiglass				
Rubber -	Rubber			
	Surgeons' Glove			
Misc. Combustibles -	Graphite (molds)			
	Paper	0.8		
	Wood			
	Cardboard			
	Cloth			

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)			4-1
ABSORBENT (PORTLAND CEMENT)			4-1, 2
ABSORBENT (VERMICULITE)			4-1
CLOTHING (SURGICAL GLOVES)			4-1, 2
ORGANICS	14	LB/FT ³	4-1
SLUDGE			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-109 BENELEX, PLEXIGLASS (a-LLW)

C. Code/Name: 302 BENELEX AND PLEXIGLASS

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of disassembled equipment of benelex neutron shields and plexiglass glovebox windows. Waste may also include surgeon's gloves, metal hinges, pieces of angle iron, and rubber gaskets.

Total Volume (m3): 55.37

Gross Mass (kg): 30,740.00

Drum Equivalents: 261.20

Physical Form: SOLID

Physical Type: METAL, OTHER, PLASTIC, RUBBER.

PCBs: ☐**Combustibility:**

- ☐ Combustible (>90%)
☒ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW**Rad. Level**☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste, generated at Rocky Flats Plant, contains mainly Benelex which is a dense, laminated, lignocellulose hardboard made from wood chips and particles (masonite corp., type 402). The Benelex is generally 2 inches thick. Some of the Benelex has lead shielding attached to it. Metal hinges, and angle iron strongbacks are also present. Plexiglass is the other major constituent in the waste. The plexiglass thickness ranges from 2 to 4 inches. Both the Benelex and the plexiglass are combustible. The waste is packaged in standard RFP drums and boxes. Content code 302 was replaced by 464 in 1973.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-109-302

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
7	DRUM	1.48	840.00	BENELEX AND PLEXIGLASS
17	BOX	53.89	29,900.00	BENELEX AND PLEXIGLASS
Subtotal	24	55.37	30,740.00	

Total 24**55.37 m3****30,740.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2	250.000	400.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-8		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	3.00E+04	2.50E+04
Totals		3.00E+04	2.50E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	7.56E+00	2.51E-07	2.00E+01	1.05E-03	2.00E+01	2.99E-07	2.38E+01	1.25E-03	2.38E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	5.7
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	15.3
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Fiter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
	Partially Combustible -	Aqueous Solutions	
		Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	71.9
		Sheetrock	
	Plastics -	Polyethylene	4.8
		Polyvinyl Chloride (PVC)	1.2
		Teflon	0.0
		Plexiglass	
<u>Combustibles</u> (>90% Combustible)	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	1.2
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
OTHER (BENELEX)			4-1
PLASTIC (PLEXIGLASS)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-109 BENELEX, PLEXIGLASS (a-LLW)

C. Code/Name: 464 BENELEX AND PLEXIGLASS

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of disassembled equipment of benelex neutron shields and plexiglas glovebox windows. Waste may also include surgeon's gloves, metal hinges, pieces of angle iron, and rubber gaskets.

Total Volume (m3): 3.82

Gross Mass (kg): 2,400.00

Drum Equivalents: 18.00

Physical Form: SOLID

Physical Type: METAL, OTHER, PLASTIC, RUBBER.

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☒ Partially Combustible (10%-90%)☐ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste, generated at Rocky Flats Plant, contains mainly Benelex which is a dense, laminated, lignocellulose hardboard made from wood chips and particles (masonite corp., type 402). The benelex is generally 2 inches thick. Some of the Benelex has lead shielding attached to it. Metal hinges, and angle iron strongbacks are also present. Plexiglass is the other major constituent in the waste. The plexiglass thickness ranges from 2 to 4 inches. Both the Benelex and the plexiglass are combustible. The waste is packaged in standard RFP drums and boxes.

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INEL Waste Profile Sheet

ALLMW

ID-EGG-109-464

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	18	DRUM	3.82	2,400.00	BENELEX AND PLEXIGLASS
Subtotal	18		3.82	2,400.00	

Total 18**3.82 m3****2,400.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volume.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2	250.000	400.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)	
<u>Non-Combustible</u> ($<10\%$ Combustible)	Glass -	Glass Rasching Rings	5.7	
		Other Glass		
	Metals -	Carbon Steel	15.3	
		Stainless Steel		
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal		
		Lead (Bulk Pb)		
		Other HVPM(Zn,Cd)		
	Misc. Non-Combustible -	Ceramic (molds)	15.3	
		Firebrick		
		Concrete		
		Portland Cement		
		Dirt/Soil		
		Ash		
		Oil-dri		
	Filters/Insulation -	Vermiculite	15.3	
		Salts		
		Glass Filter Media		
		Asbestos (filter, insulation)		
		Filter Dust		
Magnesia (insulations)				
Inorganic Sludge -		Sludge High Na2O (1st Stage)		15.3
	Sludge High CaO (2nd Stage)			
<u>Partial Combustible</u> ($10\%-90\%$ Combustible)	Partially Combustible -	Aqueous Solutions	71.9	
		Leaded Rubber		
	Organic Sludge			
	Uncemented Resin			
	Cemented Resin			
	Asphalt			
	Benelex/lead			
	Sheetrock			
	Plastics -	Polyethylene		4.8
		Polyvinyl Chloride (PVC)		1.2
		Teflon		0.0
		Plexiglass		
	Rubber -	Rubber		
		Surgeons' Glove		
	Misc. Combustibles -	Graphite (molds)		
		Paper		1.2
		Wood		
		Cardboard		
		Cloth		

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
METAL (METAL HINGES, ANGLE IRON)			4-1
OTHER (BENELEX)			4-1, 2
PLASTIC (PLEXIGLASS)			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-112

CEMENTED SLUDGES (a-LLW)

C. Code/Name: 4

SPECIAL SET UPS (CEMENT)

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste stream consists of cemented liquid wastes from paint strippers, degreasers, and cleaning solvents. This waste sludge is generated by removal from processing tanks that collected liquid effluents from floor drains.

Total Volume (m3): 103.88

Gross Mass (kg): 130,000.01

Drum Equivalents: 490.00

Physical Form: SOLID

Physical Type: ABSORBENT MATERIALS, SLUDGE

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste comes from the Rocky Flats Plant. It contains organics, alcohols, organic acids and EDTA (Versenes) set in portland and magnesia. The waste is packaged in drums in standard RFP fashion. One exception to the standard packaging is that dry portland cement is added to the bottom of each barrel as an adsorbent. Liquids are analyzed or assayed before being released for disposal. Some drums may be filled with empty poly bottles or cement-filled poly bottles.

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INEL Waste Profile Sheet

ALLMW

ID-EGG-112-4

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	490	DRUM	103.88	130,000.01	SPECIAL SET UPS (CEMENT)
Subtotal	490		103.88	130,000.01	

Total	490	103.88 m3	130,000.01 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID			10.000
D006	CADMIUM		7440-43-9	5	10.000
D008	LEAD		7439-92-1	10	10.000
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2	10	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	75	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	25	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	700	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1	25	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3	10	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	50	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	9.40E+04	8.50E+04
Totals		9.40E+04	8.50E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting trans-uranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All trans-uranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	6.06E+01	6.48E-07	5.17E+01	2.72E-03	5.17E+01	7.17E-07	5.72E+01	3.01E-03	5.72E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
		Misc. Non-Combustible - Ceramic (molds)	
		Firebrick	
		Concrete	94.0
		Portland Cement	3.8
		Dirt/Soil	
		Ash	
		Oil-dn	1.1
		Vermiculite	0.2
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
		Partially Combustible - Leaded Rubber	
<u>Partial Combustible</u> (10%-90% Combustible)		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	0.7
		Polyvinyl Chloride (PVC)	0.2
<u>Combustibles</u> (>90% Combustible)		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (PORTLAND CEMENT)			4-1
OTHER (ORGANICS, ALCOHOLS, EDTA SET IN PORTLAND)			4-1
PLASTIC (POLY BOTTLES)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-112

CEMENTED SLUDGES (a-LLW)

C. Code/Name: 112

SOLID ORGANICS

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste stream consists of cemented liquid wastes from paint strippers, degreasers, and cleaning solvents. This waste sludge is generated by removal from processing tanks that collected liquid effluents from floor drains.

Total Volume (m3): 5.09

Gross Mass (kg): 4,300.00

Drum Equivalents: 24.00

Physical Form: SOLID

Physical Type: SLUDGE

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

Certified (for WIPP) TRU solid organic waste consists of cemented or absorbed organic liquids from production or laboratory processes. The content code certifiably packaged and renamed 112 is 700, Oasis waste. Oasis waste is packaged in 55-gallon drums or SWBs.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

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INEL Waste Profile Sheet

ALLMW

ID-EGG-112-112

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	24	DRUM	5.09	4,300.00	CERTIFIED SOLID ORGANICS
Subtotal	24		5.09	4,300.00	

Total 24**5.09 m3****4,300.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D022	CHLOROFORM		67-66-3	100.000	200.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	100.000	200.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	5.000	100.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	5.000	100.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	5.000	100.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCvg < 100	4.30E+03	3.60E+03
Totals		4.30E+03	3.60E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	7.54E-01	1.75E-07	1.40E+01	7.34E-04	1.40E+01	2.11E-07	1.68E+01	8.84E-04	1.68E+01

F. Design Basis Bulk Waste Materials**WASTE MATRIX CONSTITUENTS**

When no data are available, please refer to Section 3.7 of this report.

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
1,1,1-TRICHLOROETHANE (TCA)	10	% WT	4-1, 2, 7
1,1,2-TRICHLORO 1,2,2-TRIFLUOROETHANE (FREON)	1-10	% WT	4-1, 2, 7
ABSORBENT			4-1
CARBON TETRACHLORIDE	1-10	% WT	4-1, 2, 7
CHLOROFORM	10	% WT	4-7
ORGANICS			4-1
XYLENE	1-10	% WT	4-7

A. IDENTIFICATION

INEL ID/Name: ID-EGG-112

CEMENTED SLUDGES (a-LLW)

C. Code/Name: 114

CERTIFIED SOLID INORGANIC PROCESS SOLUTION

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste stream consists of cemented liquid wastes from paint strippers, degreasers, and cleaning solvents. This waste sludge is generated by removal from processing tanks that collected liquid effluents from floor drains.

Total Volume (m3): 4.03

Gross Mass (kg): 3,100.00

Drum Equivalents: 19.00

Physical Form: SOLID

Physical Type: SLUDGE

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

Certified (for WIPP) TRU solid inorganic process solution waste consists of cemented inorganic particulates of sludge-like (not chemically precipitated) wastes from plutonium recovery operations. The waste is packaged in 55-gallon drums of SWBs.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-112-114

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
19	DRUM	4.03	3,100.00	CERTIFIED SOLID INORGANIC PROCESS SOLUTION
Subtotal	19	4.03	3,100.00	

Total 19**4.03 m3****3,100.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD		7439-92-1	1.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	1.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	1.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	1.000	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	1.000	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1	10	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3	10	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	10	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	3.10E+03	2.50E+03
Totals		3.10E+03	2.50E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	2.13E+00	6.91E-07	5.51E+01	2.90E-03	5.51E+01	8.50E-07	6.78E+01	3.57E-03	6.78E+01

F. Design Basis Bulk Waste Materials**WASTE MATRIX CONSTITUENTS**

When no data are available, please refer to Section 3.7 of this report.

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
1,1,1-TRICHLOROETHANE (TCA)	0.1	% WT	4-1, 2, 7
1,1,2-TRICHLORO 1,2,2-TRIFLUOROETHANE (FREON)	0.1	% WT	4-1, 2, 7
BUTYL ALCOHOL	FEW	PPM BY WT	4-1, 2, 7
CARBON TETRACHLORIDE	0.1	% WT	4-1, 2, 7
LEAD	0.1	% WT	4-1, 2, 7
METHYL ALCOHOL	FEW	PPM BY WT	4-1, 2, 7
METHYLENE CHLORIDE	0.1	% WT	4-1, 2, 7
SLUDGE (CEMENTED)			4-1
XYLENE	FEW	PPM BY WT	4-1, 2, 7

A. IDENTIFICATION

INEL ID/Name: ID-EGG-112 CEMENTED SLUDGES (a-LLW)

C. Code/Name: 834 HIGH LEVEL ACID

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste stream consists of cemented liquid wastes from paint strippers, degreasers, and cleaning solvents. This waste sludge is generated by removal from processing tanks that collected liquid effluents from floor drains.

Total Volume (m3): 39.86

Gross Mass (kg): 35,500.00

Drum Equivalents: 188.00

Physical Form: SOLID

Physical Type: ABSORBENT MATERIALS, SLUDGE

PCBs: ☐**Combustibility:**

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled

Content Code Description:

This waste comes from Mound Laboratory. It consists of acid liquids, mainly nitric, absorbed onto a clay called Florco. The Florco is then placed in a drum bag in a drum lined with a 90 mil poly liner. Analytical assay values are available for each drum.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-112-834

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
188	DRUM	39.86	35,500.00	HIGH LEVEL ACID
Subtotal	188	39.86	35,500.00	

Total 188

39.86 m3

35,500.00 kg

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D001	IGNITABLE	OXIDIZERS			10.000
D002	CORROSIVE	ACID		380.000	600.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
		Ceramic (molds)	
	Misc. Non-Combustible -	Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	
		Vermiculite	65.0
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	30.0
		Leaded Rubber	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	4.0
		Polyvinyl Chloride (PVC)	1.0
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (FLORCO)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-112 CEMENTED SLUDGES (a-LLW)

C. Code/Name: 835 HIGH LEVEL CAUSTIC

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste stream consists of cemented liquid wastes from paint strippers, degreasers, and cleaning solvents. This waste sludge is generated by removal from processing tanks that collected liquid effluents from floor drains.

Total Volume (m3): 178.93

Gross Mass (kg): 146,000.01

Drum Equivalents: 844.00

Physical Form: SOLID

Physical Type: ABSORBENT MATERIALS, SLUDGE

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste comes from Mound Laboratory. It consists of caustic waste and neutralized waste liquids, absorbed onto a clay called Florco. The Florco is then placed in a drum bag in a drum lined with a 90 mil poly liner. Analytical assay values are available for each drum.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-112-835

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	844	DRUM	178.93	146,000.01	HIGH LEVEL CAUSTIC
Subtotal	844		178.93	146,000.01	

Total 844**178.93 m3****146,000.01 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ALKALINE		300.000	600.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	2.80E+02	2.20E+02
Totals		2.80E+02	2.20E+02

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	2.64E-01	9.43E-07	7.52E+01	3.96E-03	7.52E+01	1.20E-06	9.61E+01	5.05E-03	9.61E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
		Misc. Non-Combustible -	
		Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	
		Vermiculite	65.0
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (litter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	30.0
		Partially Combustible -	
<u>Partial Combustible</u> (10%-90% Combustible)		Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
		Plastics -	
<u>Combustibles</u> (>90% Combustible)		Polyethylene	4.0
		Polyvinyl Chloride (PVC)	1.0
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (FLORCO)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-112

CEMENTED SLUDGES (a-LLW)

C. Code/Name: 836

HIGH LEVEL SLUDGE/CEMENT

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste stream consists of cemented liquid wastes from paint strippers, degreasers, and cleaning solvents. This waste sludge is generated by removal from processing tanks that collected liquid effluents from floor drains.

Total Volume (m3): 880.22

Gross Mass (kg): 1,190,000.08

Drum Equivalents: 4,152.00

Physical Form: SOLID

Physical Type: OTHER

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste is from Mound Labs. The waste consists of shower water, decontamination water, cooling water, and some acids and caustics which have been solidified in portland cement. The cement is poured into a drum lined with a 90-mil poly liner. Analytical assay values are available on a batch basis.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-112-836

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	4152	DRUM	880.22	1,190,000.08	HIGH LEVEL SLUDGE/CEMENT
Subtotal	4152		880.22	1,190,000.08	

Total	4,152	880.22 m3	1,190,000.08 kg
--------------	--------------	------------------	------------------------

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID			10.000
D006	CADMIUM	.	7440-43-9	5	10.000
D007	CHROMIUM	.	7440-47-32		10.000
D008	LEAD	.	7439-92-1	10	10.000
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		260
D010	SELENIUM	.	7782-49-2		10.000
D011	SILVER	.	7440-22-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	75	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	ACETONE	67-64-1		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1	25	10.000
P015	BERYLLIUM DUST	.	7440-41-7	1.000	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	7.50E+03	6.60E+03
Totals		7.50E+03	6.60E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-83	4.44E-02	6.04E-09	7.68E+01	4.19E-03	7.68E+01	6.79E-09	8.64E+01	4.72E-03	8.64E+01
U-235	1.20E+01	9.52E-05	0.00E+00	1.83E-01	1.83E-01	1.49E-04	0.00E+00	2.86E-01	2.86E-01
U-238	4.60E+03	3.65E-02	0.00E+00	1.23E+01	1.23E+01	5.70E-02	0.00E+00	1.92E+01	1.92E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)	
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings		
		Other Glass		
	Metals -	Carbon Steel		
		Stainless Steel		
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal		
		Lead (Bulk Pb)		
		Other HVPM(Zn,Cd)		
	Misc. Non-Combustible -	Ceramic (molds)		
		Firebrick		
		Concrete		
		Portland Cement	41.0	
		Dirt/Soil		
		Ash		
		Oil-dri		
		Vermiculite		
		Salts		
		Filters/Insulation -	Glass Filter Media	
			Asbestos (filter, insulation)	
Filter Dust				
Magnesia (insulations)				
Inorganic Sludge -	Sludge High Na2O (1st Stage)	27.5		
	Sludge High CaO (2nd Stage)	27.5		
	Aqueous Solutions			
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber		
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelox/lead		
		Sheetrock		
		Plastics -	Polyethylene	3.2
			Polyvinyl Chloride (PVC)	0.8
			Teflon	0.0
<u>Combustibles</u> (>90% Combustible)	Plastics -	Plexiglass		
		Rubber -	Rubber	
			Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)		
		Paper		
		Wood		
		Cardboard		
		Cloth		

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (PORTLAND CEMENT)			4-1
WATER (SHOWER WATER, DECON WATER, COOLING WATER)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-112

CEMENTED SLUDGES (a-LLW)

C. Code/Name: 976

BLDG 776 PROCESS SLUDGE

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste stream consists of cemented liquid wastes from paint strippers, degreasers, and cleaning solvents. This waste sludge is generated by removal from processing tanks that collected liquid effluents from floor drains.

Total Volume (m3): 63.82

Gross Mass (kg): 41,400.00

Drum Equivalents: 301.06

Physical Form: SOLID

Physical Type: ABSORBENT MATERIALS, SLUDGE

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled

Content Code Description:

This waste is from Rocky Flats. The waste consists of sludge from floor drains in a Pu process facility that have been cemented in portland. The cement is described as a poor grade.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-112-976

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
2	DRUM	0.42	400.00	BLDG 776 PROCESS SLUDGE
20	BOX	63.40	41,000.00	BLDG 776 PROCESS SLUDGE
Subtotal	22	63.82	41,400.00	

Total 22**63.82 m3****41,400.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID			10.000
D006	CADMIUM	.	7440-43-9	5	10.000
D007	CHROMIUM	.	7440-47-32		10.000
D008	LEAD	.	7439-92-1	10	10.000
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		260
D022	CHLOROFORM	.	67-66-3		10.000
D028	1,2-DICHLOROETHANE	.	107-06-2		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	75	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	25	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	700	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1	25	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3	10	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	50	10.000
P015	BERYLLIUM DUST	.	7440-41-7	1.000	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.70E+04	1.50E+04
Totals		1.70E+04	1.50E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	7.00E-01	4.18E-08	3.33E+00	1.75E-04	3.33E+00	4.74E-08	3.78E+00	1.99E-04	3.78E+00

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	65.0
		Dirt/Soil	
		Ash	
		Oil-dri	
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
<u>Partial Combustible</u> (10%-90% Combustible)	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	15.0
		Sludge High CaO (2nd Stage)	15.0
	Partially Combustible -	Aqueous Solutions	
		Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelox/lead	
		Sheetrock	
	Plastics -	Polyethylene	4.0
		Polyvinyl Chloride (PVC)	1.0
		Teflon	0.0
		Plexiglass	
<u>Combustibles</u> (>90% Combustible)	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
OTHER (SLUDGE CEMENTED IN PORTLAND CEMENT)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-112 CEMENTED SLUDGES (a-LLW)

C. Code/Name: 978 LAUNDRY SLUDGE

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste stream consists of cemented liquid wastes from paint strippers, degreasers, and cleaning solvents. This waste sludge is generated by removal from processing tanks that collected liquid effluents from floor drains.

Total Volume (m3): 25.36

Gross Mass (kg): 13,100.00

Drum Equivalents: 119.62

Physical Form: SOLID

Physical Type: SLUDGE

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste is from Rocky Flats. The waste consists of sludge from laundry operations that have been cemented in portland. The cement is described as a poor grade.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-112-978

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	8	BOX	25.36	13,100.00	LAUNDRY SLUDGE
Subtotal	8		25.36	13,100.00	

Total 8

25.36 m3

13,100.00 kg

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID			10.000
D006	CADMIUM	.	7440-43-9	5	10.000
D007	CHROMIUM	.	7440-47-32		10.000
D008	LEAD	.	7439-92-1	10	10.000
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		260
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	75	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	25	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	700	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1	25	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3	10	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	50	10.000
P015	BERYLLIUM DUST	.	7440-41-7	1.000	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.60E+04	1.30E+04
Totals		1.60E+04	1.30E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-53 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

AIM

Association for Information and Image Management

1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910

301/587-8202

Centimeter

Inches

MANUFACTURED TO AIM STANDARDS
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E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	3.40E+00	2.18E-07	1.74E+01	9.12E-04	1.74E+01	2.54E-07	2.03E+01	1.07E-03	2.03E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	65.0
		Dirt/Soil	
		Ash	
		Oil-dri	
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (1st Stage)	15.0
		Sludge High CaO (2nd Stage)	15.0
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	4.0
		Polyvinyl Chloride (PVC)	1.0
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
OTHER (LAUNDRY SLUDGE CEMENTED IN PORTLAND)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114 COMBUSTIBLES (a-LLW)

C. Code/Name: 10 COMBUSTIBLES

B. DESCRIPTION**INEL ID (WMIS) Description:**

Line/nonline generated combustible material, generated from D&D of a plutonium laboratory, maintenance and cleanup operations.

Total Volume (m3): 33.71

Gross Mass (kg): 13,900.00

Drum Equivalents: 159.00

Physical Form: SOLID

Physical Type: PLASTIC, PAPER, ABSORBENT MATERIALS, FILTERS, RUBBER

PCBs: ☐

Combustibility:

- ☒ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at Bettis Atomic Power Laboratory, consists primarily of rags, gloves, plastic, paper, carbo-wax, filters, oil-contaminated "absorbal" (diatomaceous earth), and rubber. The waste stream may also contain noncombustible items. Levels of hazardous materials are unknown.

The waste is WIPP certifiable although the high proportions of organic material in the waste may be subject to gas generation. The waste organic material may exceed 14 lb/ft³ for drums. Although limited fines are expected from floor sweepings, powder, etc., levels of fines should be within WIPP-WAC limits. The waste is packaged with no free liquids, sludges, explosives, compressed gases, pyrophoric, or corrosive materials.

Small waste items are wrapped in plastic and placed inside 3.25 inch diameter by 7 inch high tin-plated steel cans with screw-on lids. The can is placed inside a steel "juice can" with roll-seam sealed lids. Larger items are wrapped in plastic and placed inside 4.375 inch diameter by 20 or 24 inch high tin-plated steel can. The sealed can was wrapped in plastic and placed inside 55-gallon waste drums lined with 90-mil drum liners. Between 15-80 cans fit in a drum. Prior to 1974, each drum was assayed by calculating weight differences to determine fissile content. After 1974, a U-232 assay gauge was used.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-114-10

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	159	DRUM	33.71	13,900.00	COMBUSTIBLES
Subtotal	159		33.71	13,900.00	

Total 159**33.71 m3****13,900.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	1.500	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	1.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	2.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	750	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	7.00E+04	5.10E+04
Totals		7.00E+04	5.10E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
TH-232	1.16E+07	1.68E-01	0.00E+00	4.66E+01	4.66E+01	2.28E-01	0.00E+00	6.34E+01	6.34E+01
U-233	4.13E+04	5.92E-04	0.00E+00	5.73E+03	5.73E+03	8.06E-04	0.00E+00	7.80E+03	7.80E+03

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	0.1
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	3.7
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	0.0
		Misc. Non-Combustible -	
		Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	1.7
		Vermiculite	1.1
		Salts	
		Filters/Insulation -	
		Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
		Partially Combustible -	
<u>Partial Combustible</u> (10%-90% Combustible)		Leaded Rubber	2.4
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
		Plastics -	
<u>Combustibles</u> (>90% Combustible)		Polyethylene	31.7
		Polyvinyl Chloride (PVC)	7.9
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	1.3
		Surgeons' Glove	7.7
	Misc. Combustibles -	Graphite (molds)	
		Paper	28.2
		Wood	6.4
		Cardboard	3.2
		Cloth	4.7

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT ("ABSORBAL" DIATOMACEOUS EARTH)			4-1
CLOTHING (GLOVES)			4-1, 2
FILTERS			4-1
METAL (TIN PLATED STEEL CANS)			4-1
ORGANICS (CARBO-WAX)			4-1
PAPER			4-1
PLASTIC			4-1
RAGS			4-1, 2
RUBBER			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114

COMBUSTIBLES (a-LLW)

C. Code/Name: 116

CERTIFIED TRU COMBUSTIBLE WASTE

B. DESCRIPTION**INEL ID (WMIS) Description:**

Line/nonline generated combustible material, generated from D&D of a plutonium laboratory, maintenance and cleanup operations.

Total Volume (m3): 371.10

Gross Mass (kg): 89,628.01

Drum Equivalents: 1,750.48

Physical Form: SOLID

Physical Type: PLASTIC, RAGS

PCBs: ☐

Combustibility:

- ☒ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

Certified (for WIPP) TRU combustible waste consists of cellulosic, plastic or cloth waste from various processes. The content codes certifiably packaged and renamed 116 are 330, 336, 337, 900, and 970. All five of the content codes are included in the combustible category.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

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INEL Waste Profile Sheet

ALLMW

ID-EGG-114-116

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	1	DRUM	0.21	78.00	CERTIFIED TRU COMBUSTIBLE WASTE
	117	BOX	370.89	89,550.01	CERTIFIED TRU COMBUSTIBLE WASTE
Subtotal	118		371.10	89,628.01	

Total	118	371.10 m3	89,628.01 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD		7439-92-1	10.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	10.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	10.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	10.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6	10.000	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	10.000	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	9.60E+04	6.90E+04
Totals		9.60E+04	6.90E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic composition.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	2.30E+01	2.39E-07	1.91E+01	1.00E-03	1.91E+01	3.33E-07	2.65E+01	1.40E-03	2.65E+01
U-235	1.46E+02	8.84E-06	0.00E+00	1.70E-02	1.70E-02	1.20E-05	0.00E+00	2.31E-02	2.31E-02

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	0.1
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	3.7
		Lead (Bulk Pb)	
		Other HVPM (Zn, Cd)	0.0
		Misc. Non-Combustible -	
		Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	0.0
		Ash	
		Oil-dri	1.7
		Vermiculite	1.1
		Salts	
		Filters/Insulation -	
		Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
		Inorganic Sludge -	
		Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	2.4
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
		Plastics -	
<u>Combustibles</u> (>90% Combustible)		Polyethylene	31.7
		Polyvinyl Chloride (PVC)	7.9
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	1.3
		Surgeons' Glove	7.7
	Misc. Combustibles -	Graphite (molds)	
		Paper	28.2
		Wood	4.8
		Cardboard	4.8
		Cloth	4.7

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
1,1,1-TRICHLOROETHANE (TCA)	1	% WT	4-1, 2, 7
1,1,2-TRICHLORO 1,2,2-TRIFLUOROETHANE (FREON)	1	% WT	4-1, 2, 7
CARBON TETRACHLORIDE	1	% WT	4-1, 2, 7
LEAD	1	% WT	4-7
METHYLENE CHLORIDE	1	% WT	4-1, 2, 7
PLASTIC (CELLULOSIC)			4-1, 7
RAGS			4-1, 7
TRICHLOROETHYLENE (TCE)	1	% WT	4-7
XYLENE			4-7

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114

COMBUSTIBLES (a-LLW)

C. Code/Name: 330

DRY PAPER AND RAGS

B. DESCRIPTION**INEL ID (WMIS) Description:**

Line/nonline generated combustible material, generated from D&D of a plutonium laboratory, maintenance and cleanup operations.

Total Volume (m3): 3,150.63

Gross Mass (kg): 950,000.06

Drum Equivalents: 14,861.46

Physical Form: SOLID

Physical Type: PAPER, RAGS, PLASTIC, METAL, RUBBER, GLASS

PCBs: ☐

Combustibility:

- ☒ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream is the largest combustible waste stream, comprising 55% of the category by weight. The waste stream is from Rocky Flats Plant and primarily consists of line- and nonline-generated dry combustible materials such as paper, rags, plastics, surgical gloves, cloth overalls and booties, cardboard, wood, wood filter frames, PE bottles, and laundry lint. Some combustibles may be damp or moist. Limited amounts of noncombustibles such as glass, concrete, cement, leaded glovebox gloves, batteries, and metal scrap may also be present.

Some of the waste is WIPP certifiable. Wastes shipped to INEL after 1975 are certifiable, although wastes shipped prior to 1975 are not certifiable due to lack of information about the waste. Organic material in the waste is subject to gas generation. The average waste organic material content may range from 6 lb/ft³ for boxes to over 14 lb/ft³ for drums. Although limited fines are expected from floor sweepings, powder, etc., levels of fines should be within WIPP-WAC limits. The waste is packaged with no free liquids, sludges, explosives, compressed gases, pyrophoric or corrosive materials.

Depending on when and where the waste was generated at Rocky Flats, the waste packaging may vary. For wastes generated prior to 1975, packaging information is incomplete. Line-generated waste may be double contained in plastic or placed in PE bottles and then double bagged. Nonline-generated wastes were single-bagged or placed directly into the waste container. Oil-Dri may have been added to some drums.

After 1974, some waste was drummed, and some waste was placed in 4 ft x 4 ft x 7 ft boxes. Some combustibles are single, double or quadruple bagged or wrapped PVC and PE bags or plastic. Combustibles such as clothing and dryer lint are placed directly into 55 gallon drums. Some wastes are placed in 1-gallon PE bottles. Some drummed waste was repacked into boxes to reduce volume. During repacking, any noncombustibles were removed. Some boxes may contain moist combustible waste and up to 100 lb of Oil-Dri.

Drums containing wastes from the Americium Recovery Line are lead-lined. Drums shipped prior to 1977 contain compacted wastes.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-114-330

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
4230	DRUM	896.76	340,000.02	DRY PAPER AND RAGS
711	BOX	2,253.87	610,000.04	DRY PAPER AND RAGS
Subtotal	4941	3,150.63	950,000.06	

Total 4,941**3,150.63 m3****950,000.06 kg**

1. Values in this table represent actual quantities in storage.
2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD		7439-92-1		10.000
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		10.000
D022	CHLOROFORM		67-66-3		10.000
D029	1,1-DICHLOROETHYLENE		75-35-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	2.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	1.500	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	750	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	1.000	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	ETHYL BENZENE	100-41-4		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	BENZENE	71-43-2		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	5.60E+05	3.80E+05
Totals		5.60E+05	3.80E+05

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	1.06E+02	1.90E-07	1.52E+01	7.99E-04	1.52E+01	2.81E-07	2.24E+01	1.18E-03	2.24E+01
U-233	9.00E+00	4.55E-05	0.00E+00	4.41E+02	4.41E+02	6.94E-05	0.00E+00	6.72E+02	6.72E+02
U-235	9.89E+02	3.97E-05	0.00E+00	7.63E-02	7.63E-02	6.11E-05	0.00E+00	1.18E-01	1.18E-01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	0.1
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	3.7
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	0.0
		Misc. Non-Combustible -	
		Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	0.0
		Ash	
		Oil-dri	1.7
		Vermiculite	1.1
		Salts	
		Filters/Insulation -	
		Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
		Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
		Leaded Rubber	2.4
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelux/lead	
		Sheetrock	
		Polyethylene	31.7
		Polyvinyl Chloride (PVC)	7.9
		Teflon	0.0
		Plexiglass	
		Rubber	1.3
		Surgeons' Glove	7.7
		Misc. Combustibles -	
		Graphite (molds)	
		Paper	28.2
		Wood	4.8
		Cardboard	4.8
		Cloth	4.7

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)	100	LBS/BOX	4-1
CLOTHING (OVERALLS, BOOTIES, LEADED GLOVES)			4-1
GLASS			4-1
METAL (SCRAPS)			4-1
ORGANICS	6 - 14	LB/FT3	4-1
OTHER (LAUNDRY LINT, CEMENT, BATTERIES)			4-1
PAPER (PAPER, CARDBOARD)			4-1
PLASTIC			4-1
RAGS			4-1
RUBBER (SURGICAL GLOVES)			4-1
WOOD			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114

COMBUSTIBLES (a-LLW)

C. Code/Name: 336

MOIST PAPER AND RAGS

B. DESCRIPTION**INEL ID (WMIS) Description:**

Line/nonline generated combustible material, generated from D&D of a plutonium laboratory, maintenance and cleanup operations.

Total Volume (m3): 1,452.40

Gross Mass (kg): 598,000.04

Drum Equivalents: 6,850.96

Physical Form: SOLID

Physical Type: PAPER, RAGS, PLASTIC, RUBBER, GLASS, ABSORBENT MATERIALS

PCBs: ☐

Combustibility:

- ☒ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

The waste stream is from the Rocky Flats Plant and primarily consists of damp or wet line- and nonline-generated dry combustible materials such as paper, rags, plastics, surgical gloves, canvas, cardboard, wood, PE bottles, and rubber. Some combustibles may be damp or moist. Moisture content may range from damp to wet, and may include water, soaps, nitric acid, or caustic solutions. Limited amounts of noncombustibles such as glass, concrete, cement, leaded glovebox gloves, and metal scrap may also be present. These wastes are mostly from decontamination and cleanup work, and may be from any plutonium area.

Some of the waste is WIPP certifiable. Wastes shipped to INEL after 1975 are certifiable, with some processing to remove free liquids, aerosol cans or other noncertifiable materials. Wastes shipped prior to 1975 are not certifiable due to lack of information about the waste. Organic material in the waste is subject to gas generation. The average waste organic material content may range from 6 lb/ft³ for boxes to over 14 lb/ft³ for drums. Combustibles in the waste exceed 25 volume percent. Although limited fines are expected from floor sweepings, powder, etc., levels of fines should be within WIPP-WAC limits. There may be some free liquids present. No explosives or compressed gases are present after 1976. No aerosol cans are present after 1977. Prior to 1975 some spontaneous ignition material and nitric acid may be included.

Depending on when and where the waste was generated at Rocky Flats, the waste packaging may vary. For wastes generated prior to 1975, packaging information is incomplete. Waste may be placed directly into drums, or single or double contained in plastic. Some waste may also be placed in PE bottles and then double bagged. Oil-Dri may have been added to some drums. Drums were prepared according to pre and post-1972 procedures. Inspections were done and adsorbents (Oil-Dri and vermiculite) were added according to standard procedures.

Some waste was also containerized in plywood boxes. The waste is contained in one to four layers of plastic. Oil-Dri and portland cement were added in layers with the waste. Depending on moisture conditions, the amount of adsorbent varies from 25-200 lb per box. Boxes were prepared according to pre and post-1972 procedures.

After 1974, waste was typically double contained in PVC and PE bags or else placed in PE bottles and then double-bagged. Adsorbent was not added to the waste. Until 1977, some of the waste was compacted in prepared waste drums. Some drummed waste was also repacked into boxes to reduce volume. All drums are assayed. The fissile content of boxes is determined from the combined assays of the waste drums emptied into the boxes. After 1980, boxes received a second assay. Drums containing wastes from the Americium Recovery Line and lead-lined.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-114-336

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
6522	DRUM	1,382.66	580,000.04	MOIST PAPER AND RAGS
22	BOX	69.74	18,000.00	MOIST PAPER AND RAGS
Subtotal	6544	1,452.40	598,000.04	

Total	6,544	1,452.40 m3	598,000.04 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D001	IGNITABLE	OXIDIZERS			10.000
D002	CORROSIVE	ACID			10.000
D008	LEAD		7439-92-1		10.000
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		10.000
D022	CHLOROFORM		67-66-3		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	2.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	1.500	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	750	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	1.000	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	ACETONE	67-64-1		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	2.00E+04	1.30E+04
Totals		2.00E+04	1.30E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	6.01E+00	2.97E-07	2.37E+01	1.24E-03	2.37E+01	4.50E-07	3.59E+01	1.89E-03	3.59E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	2.3
		Lead (Bulk Pb)	
		Other HVPM (Zn, Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	4.7
		Vermiculite	5.8
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
	Inorganic Sludge -	Magnesia (insulations)	
		Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Aqueous Solutions	
		Leaded Rubber	2.1
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benolex/lead	
		Sheetrock	
		Plastics -	
		Polyethylene	37.6
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyvinyl Chloride (PVC)	9.9
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	0.5
		Surgeons' Glove	2.9
		Misc. Combustibles -	
		Graphite (molds)	
		Paper	23.9
		Wood	1.6
		Cardboard	1.6
		Cloth	7.0

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)	200	LBS/BOX	4-1
ABSORBENT (PORTLAND CEMENT)	200	LBS/BOX	4-1
ABSORBENT (VERMICULITE)	200	LBS/BOX	4-1
CLOTHING (LEADED GLOVES)			4-1
GLASS			4-1
METAL (SCRAPS)			4-1
ORGANICS	6 - 14	LB/FT3	4-1
OTHER (CEMENT, BATTERIES)			4-1
PAPER			4-1
PLASTIC (PE BOTTLES)			4-1
RAGS			4-1
RUBBER (SURGICAL GLOVES)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114

COMBUSTIBLES (a-LLW)

C. Code/Name: 337

PLASTICS, TEFLON, WASH, PVC

B. DESCRIPTION**INEL ID (WMIS) Description:**

Line/nonline generated combustible material, generated from D&D of a plutonium laboratory, maintenance and cleanup operations.

Total Volume (m3): 352.94

Gross Mass (kg): 123,800.01

Drum Equivalents: 1,664.81

Physical Form: SOLID

Physical Type: PLASTIC, PAPER, RUBBER

PCBs: ☐

Combustibility:

- ☒ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream is from the Rocky Flats Plant and consists of various types of plastics such as PE, polyvinyl chloride (PVC), teflon (TFE), and nonleaded rubber items. The waste may be bags, vials, bottles, sheeting, and surgical gloves. Some other combustible wastes such as respirator facemasks and paper may be included. Some small amounts of noncombustible wastes may also be present.

Some of the waste is WIPP certifiable. Wastes shipped to INEL after 1975 are certifiable. Wastes shipped prior to 1975 are not certifiable due to lack of information about the waste. Organic material in the waste is subject to gas generation. The average waste organic material content may range from 6 lb/ft³ for boxes to over 14 lb/ft³ for drums. Levels of fines should be within WIPP-WAC limits, since added adsorbents are not included in the fines evaluation. There should be no sludges, free liquids, explosives, compressed gases, pyrophoric, toxic, or corrosive materials.

Depending on when and where the waste was generated at Rocky Flats, the waste packaging may vary. For wastes generated prior to 1975, packaging information is incomplete. Waste may be placed directly into prepared drums, or double contained in plastic bags. Small amounts of portland cement were added to bottles to absorb any residual liquids. Oil-Dri may have been added to some drums. Drums were prepared according to pre and post-1972 procedures. Inspections were done and adsorbents (Oil-Dri or vermiculite) were added according to standard procedures.

Some waste was also containerized in plywood boxes. Boxes were prepared according to pre and post-1972 procedures. Some of the waste containers are lead-lined.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-114-337

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1605	DRUM	340.26	120,000.01	PLASTICS, TEFLON, WASH, PVC
4	BOX	12.68	3,800.00	PLASTICS, TEFLON, WASH, PVC
Subtotal	1609	352.94	123,800.01	

Total 1,609**352.94 m3****123,800.01 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD		7439-92-1		10.000
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		10.000
D022	CHLOROFORM		67-66-3		10.000
D029	1,1-DICHLOROETHYLENE		75-35-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	2.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	1.500	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	750	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	ACETONE	67-64-1		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	ETHYL BENZENE	100-41-4		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	BENZENE	71-43-2		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	3.80E+03	2.70E+03
Totals		3.80E+03	2.70E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nonclassifications for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass per Gross Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	6.00E-01	1.56E-07	1.24E+01	6.54E-04	1.24E+01	2.21E-07	1.76E+01	9.25E-04	1.76E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	23.0
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	2.5
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	0.0
		Misc. Non-Combustible -	
		Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	2.4
		Vermiculite	2.3
		Salts	0.4
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	7.6
	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelox/lead	
		Sheetrock	
	Plastics -	Polyethylene	25.9
		Polyvinyl Chloride (PVC)	6.4
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	0.6
		Surgeons' Glove	16.0
	Misc. Combustibles -	Graphite (molds)	
		Paper	4.4
		Wood	3.8
		Cardboard	3.8
		Cloth	1.0

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)			4-1
ABSORBENT (PORTLAND CEMENT)			4-1
ABSORBENT (VERMICULITE)			4-1
CLOTHING (RESPIRATOR FACE MASKS)			4-1
ORGANICS	6 - 14	LB/FT3	4-1
OTHER (NONCOMBUSTIBLE WASTES)			4-1
PAPER			4-1
PLASTIC (PE, PVC, TEFLON)			4-1
RUBBER (NONLEADED RUBBER ITEMS, SURGICAL GLOVES)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114

COMBUSTIBLES (a-LLW)

C. Code/Name: 826

COMBUSTIBLE EQUIPMENT BOXES OR FLOOR
SWEEPINGS AND RUST**B. DESCRIPTION****INEL ID (WMIS) Description:**

Line/nonline generated combustible material, generated from D&D of a plutonium laboratory, maintenance and cleanup operations.

Total Volume (m3): 9.93

Gross Mass (kg): 3,240.00

Drum Equivalents: 46.86

Physical Form: SOLID

Physical Type: PLASTIC, RUBBER, OTHER

PCBs: ☐

Combustibility:

☒ Combustible (>90%)☐ Partially Combustible (10%-90%)☐ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream, generated at Mound Laboratory, includes two different types of waste depending on when the waste was generated. Prior to 1980, this content code was used for glovebox floor sweepings and rust. The actual amount of floor sweepings is small. After 1981, this content code is used for large, combustible waste items such as plastic tanks, plexiglass shielding and windows, wood, and fiberglass conveyor glovebox sections. These types of large combustible wastes were included in content code 824 prior to 1980. Limited amounts of smaller combustibles such as shoe covers and surgical gloves are also included.

The waste is certifiable (for WIPP) except for containers of floor sweepings. Gas generation may occur since the organic content exceeds 6 lb/ft³. The waste is 100 volume percent combustible. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in this waste.

All of this waste is packaged in standard boxes. Each item is generally rinsed with water, wiped with wet rags and single or double contained in plastic. Some items were placed directly into boxes without additional containment, depending on contamination levels. Floor sweepings are contained in 1 gallon plastic-coated cardboard cartons. Florco absorbent is added to each box for residual liquids. Each box is assayed using a box counter, and spot radiation and contamination checks are also done.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-114-826

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
2	DRUM	0.42	240.00	COMBUSTIBLE EQUIPMENT BOXES OR FLOOR SWEEPINGS AND
3	BOX	9.51	3,000.00	COMBUSTIBLE EQUIPMENT BOXES OR FLOOR SWEEPINGS AND
Subtotal	5	9.93	3,240.00	

Total 5**9.93 m3****3,240.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D009	MERCURY	ELEMENTAL MERCURY CONTAMINATED WITH RADIOACTIVE MATERIALS	7439-97-6	4.000	10.000
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		260

When no Concentration Values are given, please refer to Section 3.7 of this report.

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INEL Waste Profile Sheet

ALLMW

ID-EGG-114-826

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)		
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings			
		Other Glass			
	Metals -	Carbon Steel	2.0		
		Stainless Steel	1.0		
		Aluminum (AL)			
		Tantalum 10W			
		Miscellaneous Metal			
		Lead (Bulk Pb)	1.0		
		Other HVPM(Zn,Cd)	0.0		
	Misc. Non-Combustible -	Ceramic (molds)			
		Firebrick			
		Concrete			
		Portland Cement			
		Dirt/Soil	6.7		
		Ash			
Oil-dri		3.0			
Vermiculite					
Salts					
Filters/Insulation -	Glass Filter Media	6.7			
	Asbestos (filter, insulation)				
	Filter Dust				
Inorganic Sludge -	Magnesia (insulations)				
	Sludge High Na2O (1st Stage)				
	Sludge High CaO (2nd Stage)				
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Aqueous Solutions			
		Leaded Rubber			
		Organic Sludge			
		Uncemented Resin			
		Cemented Resin			
		Asphalt			
		Benolux/lead			
		Sheetrock			
		<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	32.0
				Polyvinyl Chloride (PVC)	8.0
Teflon	0.0				
Plexiglass	6.7				
Rubber -	Rubber				
	Surgeons' Glove				
Misc. Combustibles -	Graphite (molds)				
	Paper				
	Wood		33.0		
	Cardboard				
	Cloth				

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (FLORCO)			4-1
ORGANICS	6	LB/FT3	4-1
OTHER (FIBERGLASS)			4-1
OTHER (FLOOR SWEEPINGS, RUST)			4-1
PLASTIC (PLEXIGLASS SHIELDING, TANKS)			4-1
WOOD			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114

COMBUSTIBLES (a-LLW)

C. Code/Name: 900

LSA PLASTICS, PAPER, ETC.

B. DESCRIPTION**INEL ID (WMIS) Description:**

Line/nonline generated combustible material, generated from D&D of a plutonium laboratory, maintenance and cleanup operations.

Total Volume (m3): 92.37

Gross Mass (kg): 36,793.00

Drum Equivalents: 435.72

Physical Form: SOLID

Physical Type: PAPER, PLASTIC, RUBBER

PCBs: ☐

Combustibility:

☒ Combustible (>90%)☐ Partially Combustible (10%-90%)☐ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream is from the Rocky Flats Plant and primarily consists of line- and nonline-generated combustible materials such as plastics, paper, empty PE bottles, booties, paper, plastic sheeting, and surgical gloves. The waste may be dry or damp. Limited amounts of noncombustibles may also be present.

The waste stream is the same as content code 330, and has not been used since 1974 except for 3 barrels of U-238 contaminated wastes added in 1975. The waste stream is not discussed together with Content Code 330 because of some different descriptive information in the data base.

The waste is WIPP certifiable, but since it is mostly low specific activity (LSA, <100 nci/g) which will not require shipment to WIPP, organic material in the waste is subject to gas generation. The average waste organic material content usually exceeds 14 lb/ft³ for drums and 6 lb/ft³ for boxes. Levels of fines should be within WIPP-WAC limits. There should be no sludges, free liquids, explosives, compressed gases, pyrophoric, toxic, or corrosive materials.

Depending on when and where the waste was generated at Rocky Flats, the waste packaging may vary. Most wastes were placed directly into prepared 55-gallon drums or boxes. Up to 15 lb of portland cement was added where necessary to absorb small amounts of free liquids in containers.

Drums and boxes were prepared according to pre and pos-1972 procedures. Inspections were done and adsorbents (Oil-Dri and vermiculite) were added according to standard procedures. All drums are assayed. The fissile content of boxes is determined by surveying the contents and calculating the quantity of fissile material.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-114-900

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
346	DRUM	73.35	31,611.00	LSA PLASTICS, PAPER, ETC.
6	BOX	19.02	5,182.00	LSA PLASTICS, PAPER, ETC.
Subtotal	352	92.37	36,793.00	

Total 352**92.37 m3****36,793.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD		7439-92-1		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	2.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	1.500	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	750	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	1.000	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.40E+03	1.10E+03
Totals		1.40E+03	1.10E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	2.00E-01	1.67E-07	1.33E+01	6.99E-04	1.33E+01	2.18E-07	1.74E+01	9.13E-04	1.74E+01
U-238	9.00E+03	3.69E-02	0.00E+00	1.24E+01	1.24E+01	5.11E-02	0.00E+00	1.72E+01	1.72E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)	
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings		
		Other Glass		
	Metals -	Carbon Steel	0.9	
		Stainless Steel	1.3	
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal	10.2	
		Lead (Bulk Pb)		
		Other HVPM(Zn,Cd)	0.0	
	Misc. Non-Combustible -	Ceramic (molds)		
		Firebrick		
		Concrete	2.1	
		Portland Cement	11.6	
		Dirt/Soil	0.3	
		Ash		
		Oil-dri	10.7	
		Vermiculite		
		Salts		
		Filters/Insulation -	Glass Filter Media	
			Asbestos (filter, insulation)	
	Filter Dust			
Magnesia (insulations)				
Inorganic Sludge -	Sludge High Na2O (1st Stage)			
	Sludge High CaO (2nd Stage)			
	Aqueous Solutions			
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber		
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelex/lead		
		Sheetrock		
		Plastics -	Polyethylene	10.3
			Polyvinyl Chloride (PVC)	2.6
			Teflon	0.0
Plexiglass				
Rubber -	Rubber	0.0		
	Surgeons' Glove	7.5		
Misc. Combustibles -	Graphite (molds)			
	Paper	36.2		
	Wood	0.8		
	Cardboard			
	Cloth	5.6		

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DRI)			4-1
ABSORBENT (PORTLAND CEMENT)	15	LBS/DRUM	4-1
ABSORBENT (VERMICULITE)			4-1
CLOTHING (BOOTIES)			4-1
ORGANICS	6 - 14	LB/FT3	4-1
PAPER			4-1
PLASTIC (SHEETING, PE BOTTLES)			4-1
RUBBER (SURGICAL GLOVES)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114

COMBUSTIBLES (a-LLW)

C. Code/Name: 970

WCOB

B. DESCRIPTION**INEL ID (WMIS) Description:**

Line/nonline generated combustible material, generated from D&D of a plutonium laboratory, maintenance and cleanup operations.

Total Volume (m3): 91.30

Gross Mass (kg): 27,800.00

Drum Equivalents: 430.68

Physical Form: SOLID

Physical Type: OTHER

PCBs: ☐

Combustibility:

- ☒ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream is from the Rocky Flats Plant and primarily consists of wood in the form of lumber, plywood, filter frames, and possibly ladders. Some other items such as plastic sheeting, Kimwipes, and other combustibles are also present. Plastic sheeting may have some paint coatings. Limited noncombustibles such as nails and sheetrock may also be included.

Content code 970 has not been used since 1978; it is similar to content code 330. The waste is WIPP certifiable. Organic material in the waste is subject to gas generation. The average waste organic material content usually exceeds 6 lb/ft3 for boxes and 14 lb/ft3 for drums. Although limited sawdust fines are expected, levels of fines should be within WIPP-WAC limits. The waste is packaged with no free liquids, sludges, explosives, compressed gases, pyrophoric or corrosive materials.

Depending on when and where the waste was generated at Rocky Flats, the waste packaging may vary. Most wastes were placed directly into prepared boxes. Waste such as filter frames were flattened, double-bagged and placed in prepared 55-gallon drums.

Drums and boxes were prepared according to pre-and post-1972 procedures. Inspections were done and adsorbents (Oil-Dri and vermiculite) were added according to standard procedures. All drums are assayed. The fissile content of boxes is determined by surveying the contents and calculating the quantity of fissile material.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-114-970

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
12	DRUM	2.54	1,200.00	WOOD
28	BOX	88.76	26,600.00	WOOD
Subtotal	40	91.30	27,800.00	

Total 40**91.30 m3****27,800.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD		7439-92-1		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	2.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	1.500	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	750	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	1.000	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	2.50E+04	1.80E+04
Totals		2.50E+04	1.80E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	3.80E+00	1.53E-07	1.22E+01	6.42E-04	1.22E+01	2.10E-07	1.68E+01	8.82E-04	1.68E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)	
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings		
		Other Glass		
	Metals -	Carbon Steel	45.0	
		Stainless Steel	6.1	
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal		
		Lead (Bulk Pb)		
		Other HVPM(Zn,Cd)	0.0	
	Misc. Non-Combustible -	Ceramic (molds)		
		Firebrick		
		Concrete		
		Portland Cement		
		Dirt/Soil		
		Ash		
		Oil-dri	1.1	
		Vermiculite		
		Salts		
		Filters/Insulation -	Glass Filter Media	
			Asbestos (filter, insulation)	
Filter Dust				
Magnesia (insulations)				
Inorganic Sludge -	Sludge High Na2O (1st Stage)			
	Sludge High CaO (2nd Stage)			
	Aqueous Solutions			
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber		
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelox/lead		
		Sheetrock		
		Plastics -	Polyethylene	8.8
			Polyvinyl Chloride (PVC)	2.2
			Teflon	0.0
<u>Combustibles</u> (>90% Combustible)	Plastics -	Plexiglass		
		Rubber -	Rubber	
			Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)		
		Paper	4.1	
		Wood	32.8	
		Cardboard		
		Cloth		

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DRI)			4-1
ABSORBENT (VERMICULITE)			4-1
METAL (NAILS)			4-1
ORGANICS	6-14	LB/FT3	4-1
OTHER (SHEETROCK)			4-1
PAPER (KIMWIPES)			4-1
PLASTIC (SHEETING)			4-1
WOOD (LUMBER, FILTER FRAMES, LADDERS)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-115

CONCRETE - BRICK (a-LLW)

C. Code/Name: 122

CERTIFIED TRU INORGANIC SOLID WASTE

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of whole and broken pieces of construction bricks, cinderblocks, firebrick, concrete and asphalt. Waste may also contain small amounts of dirt and combustible waste.

Total Volume (m3): 12.30

Gross Mass (kg): 9,300.00

Drum Equivalents: 58.00

Physical Form: SOLID

Physical Type: CONSTRUCTION/D&D DEBRIS, OTHER

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

Certified (for WIPP) TRU inorganic solid waste consists of waste such as insulation, firebrick, and concrete. The content codes certifiably packaged and renamed 122 are 370, 371, and 375.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-115-122

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	58	DRUM	12.30	9,300.00	CERTIFIED TRU INORGANIC SOLID WASTE
Subtotal	58		12.30	9,300.00	

Total	58	12.30 m3	9,300.00 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	10.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	1.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	1.000	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	1.000	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	9.20E+03	7.50E+03
Totals		9.20E+03	7.50E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	1.57E+00	1.71E-07	1.36E+01	7.17E-04	1.36E+01	2.10E-07	1.67E+01	8.80E-04	1.67E+01

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-115-122

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

When no data are available, please refer to Section 3.7 of this report.

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
1,1,1-TRICHLOROETHANE (TCA)	1	% WT	4-1, 2, 7
1,1,2-TRICHLORO 1,2,2-TRIFLUOROETHANE (FREON)	0.1	% WT	4-1, 2, 7
CARBON TETRACHLORIDE	0.1	% WT	4-1, 2, 7
CERAMIC (FIREBRICK, CINDERBLOCK)			4-1
METHYLENE CHLORIDE	0.1	% WT	4-1, 2, 7
OTHER (CONCRETE, INSULATION)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-115 CONCRETE - BRICK (a-LLW)

C. Code/Name: 371 FIREBRICK

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of whole and broken pieces of construction bricks, cinderblocks, firebrick, concrete and asphalt. Waste may also contain small amounts of dirt and combustible waste.

Total Volume (m3): 183.48

Gross Mass (kg): 131,000.01

Drum Equivalents: 865.48

Physical Form: SOLID

Physical Type: CONSTRUCTION/D&D DEBRIS, OTHER

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste contains whole and broken pieces of construction bricks, cinderblocks, and firebrick. Waste generated in the 1971 to 1973 period includes; firebrick from the Pu recovery incinerator and related refractory development and from four boilers; cinderblocks and other brick from routine maintenance and from D&D following the Rocky Flats Plant fire.

Waste generated since 1973 is mostly firebrick from Pu recovery operations. The firebrick generated since 1973 is a high-alumina, high-strength, class F brick manufactured by Plibrico (Plicast 40). Typical composition is Al₂O₃ = 95.67%, SiO₂ = 0.03%, Fe₂O₃ = 0.10%, TiO₂ = 0.01%, CaO = 3.6%, MgO = 0.8%, and Alkalies = 0.28%. Some of the incinerator firebrick is "scarfed" to remove surface contamination and then leached with nitric acid to recover Pu.

Waste is packaged in standard RFP drums and boxes. After 1973, mostly drums were used and the waste was placed in PVC bags which were then placed into Fibre-Paks. Two Fibre-Paks fit in a drum.

The single drum of content code 377 waste was determined by visual examination to be content code 371.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-115-371

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
701	DRUM	148.61	120,000.01	FIREBIRCK
11	BOX	34.87	11,000.00	FIREBIRCK
Subtotal	712	183.48	131,000.01	

Total 712**183.48 m3****131,000.01 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	1.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6	1.000	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	1.000	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.30E+04	9.40E+03
Totals		1.30E+04	9.40E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
AM-241	1.00E-04	8.23E-12	2.75E-02	4.94E-12	2.75E-02	1.14E-11	3.82E-02	6.85E-12	3.82E-02
PU-52	2.15E+00	1.66E-07	1.32E+01	6.94E-04	1.32E+01	2.29E-07	1.82E+01	9.58E-04	1.82E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	0.1
		Lead (Bulk Pb)	
		Other HVPM (Zn, Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	77.9
		Concrete	
		Portland Cement	
		Dirt/Soil	0.4
		Ash	
		Oil-dri	10.9
		Vermiculite	1.2
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
<u>Partial Combustible</u> (10%-90% Combustible)	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
	Partially Combustible -	Aqueous Solutions	
		Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	3.4
		Polyvinyl Chloride (PVC)	0.9
		Teflon	0.0
		Plexiglass	
<u>Combustibles</u> (>90% Combustible)	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	5.2
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
AL2O3	96	% WT	4-1
ALKALIES	0.28	% WT	4-1
CAO	3.6	% WT	4-1
CERAMIC (FIREBRICK, CINDERBLOCK)			4-1
FE2O3	0.1	% WT	4-1
MGO	0.8	% WT	4-1
SiO2	0.03	% WT	4-1
TiO2	0.01	% WT	4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-115

CONCRETE - BRICK (a-LLW)

C. Code/Name: 375

OIL-DRI RESIDUE FROM INCINERATOR

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of whole and broken pieces of construction bricks, cinderblocks, firebrick, concrete and asphalt. Waste may also contain small amounts of dirt and combustible waste.

Total Volume (m3): 3.18

Gross Mass (kg): 2,100.00

Drum Equivalents: 15.00

Physical Form: SOLID

Physical Type: ABSORBENT MATERIALS

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream, generated at Rocky Flats Plant, includes Oil-Dri absorbent.

The waste is not WIPP certifiable, due to lack of information. Organic content should be less than 14 lb/ft³. No sludges or free liquids should be present. The Oil-Dri should meet WIPP immobilization standards. No explosive or pyrophoric materials should be in this waste.

The material is contained in 55-gallon drums. Inside the drums, the waste may be contained in PE bottles and/or metal paint cans, and double-bagged in PE and PVC bags. Some waste may also be contained in PE residue process containers (RPCS). Drums were prepared and inspected according to pre and post-1972 procedures. Starting in 1982, vermiculite instead of Oil-Dri was used in the tops of the drums.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-115-375

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
15	DRUM	3.18	2,100.00	OIL-DRI RESIDUE FROM INCINERATOR
Subtotal	15	3.18	2,100.00	

Total 15**3.18 m3****2,100.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	200	10,000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10,000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	700	10,000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	50	10,000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.10E+02	8.70E+01
Totals		1.10E+02	8.70E+01

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	1.80E-02	1.64E-07	1.31E+01	6.86E-04	1.31E+01	2.06E-07	1.64E+01	8.65E-04	1.64E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	8.3
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	84.7
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	5.6
		Polyvinyl Chloride (PVC)	1.4
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)			4-1
ABSORBENT (VERMICULITE)			4-1
ORGANICS	14	LB/FT3	4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-118

FILTERS (a-LLW)

C. Code/Name: 119

CERTIFIED TRU HEPA FILTER WASTE

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of filters (HEPA, absolute, glass, fiberglass, and filter media) that have been removed from incineration processes, scrubbers, offgas systems and intake/exhaust systems. Pipe insulation, asbestos, gloves, fire blankets, etc.

Total Volume (m3): 69.16

Gross Mass (kg): 16,700.00

Drum Equivalents: 326.25

Physical Form: SOLID

Physical Type: FILTERS

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☒ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

Certified TRU (for WIPP) HEPA filter waste consists of HEPA filters or processed filter media from filter change operations. Most filters or the housings for filters are made of organic material. The content codes certifiably packaged and renamed 119 are: 335, 338, 376, and 490. The four content codes are included in the insulation and filters category.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-118-119

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	87	DRUM	18.44	5,700.00	CERTIFIED TRU HEPA FILTER WASTE
	16	BOX	50.72	11,000.00	CERTIFIED TRU HEPA FILTER WASTE
Subtotal	103		69.16	16,700.00	

Total 103**69.16 m3****16,700.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D001	IGNITABLE	OXIDIZERS			10.000
D002	CORROSIVE	ACID			10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	10.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	1.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	1.000	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	1.000	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.80E+04	1.20E+04
Totals		1.80E+04	1.20E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	3.22E+00	1.79E-07	1.43E+01	7.51E-04	1.43E+01	2.75E-07	2.19E+01	1.15E-03	2.19E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM (Zn, Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	4.4
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	52.9
		Asbestos (filter, insulation)	
		Filter Dust	35.3
	Inorganic Sludge -	Magnesia (insulations)	
		Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	5.9
		Polyvinyl Chloride (PVC)	1.5
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
1,1,1-TRICHLOROETHANE (TCA)	1	% WT	4-1, 2, 7
1,1,2-TRICHLORO 1,2,2-TRIFLUOROETHANE (FREON)	0.1	% WT	4-1, 2, 7
CARBON TETRACHLORIDE	0.1	% WT	4-1, 2, 7
FILTERS (HEPA)			4-1
METHYLENE CHLORIDE	0.1	% WT	4-1, 2, 7

A. IDENTIFICATION

INEL ID/Name: ID-EGG-118

FILTERS (a-LLW)

C. Code/Name: 328

FULFLO INCINERATOR FILTERS

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of filters (HEPA, absolute, glass, fiberglass, and filter media) that have been removed from incineration processes, scrubbers, offgas systems and intake/exhaust systems. Pipe insulation, asbestos, gloves, fire blankets, etc

Content Code Description:

There is not content information on this code, except that the waste stream was generated at the Rocky Flats Plant.

Total Volume (m3): .21

Gross Mass (kg): 78.00

Drum Equivalents: 1.00

Physical Form: SOLID

Physical Type: FILTERS

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☒ Partially Combustible (10%-90%)☐ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled

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INEL Waste Profile Sheet

ALLMW

ID-EGG-118-328

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	DRUM	0.21	78.00	FULFLO INCINERATOR FILTERS
Subtotal 1		0.21	78.00	

Total 1	.21 m3	78.00 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	OTHER CORROSIVES			10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	150	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	150	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	50	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	0.2
		Dirt/Soil	
		Ash	
		Oil-dri	
		Vermiculite	0.2
	Filters/Insulation -	Salts	
		Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
	Inorganic Sludge -	Magnesia (insulations)	
		Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelox/lead	
		Sheetrock	
	Plastics -	Polyethylene	13.8
		Polyvinyl Chloride (PVC)	3.4
		Teflon	0.0
<u>Combustibles</u> (~90% Combustible)	Plastics -	Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	74.1
		Wood	
		Cardboard	
		Cloth	0.3

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
FILTERS (FULFLO INCINERATOR FILTERS)			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-118

FILTERS (a-LLW)

C. Code/Name: 335

ABSOLUTE 8 X 8 FILTERS

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of filters (HEPA, absolute, glass, fiberglass, and filter media) that have been removed from incineration processes, scrubbers, offgas systems and intake/exhaust systems. Pipe insulation, asbestos, gloves, fire blankets, etc

Total Volume (m3): 16.54

Gross Mass (kg): 5,500.00

Drum Equivalents: 78.00

Physical Form: SOLID

Physical Type: FILTERS, RUBBER

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☒ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled

Content Code Description:

This waste stream generated at the Rocky Flats Plant, consists of absolute filters used for filtering intake and exhaust air from glovebox lines. The filters are composed of wood or particle board frames and an asbestos-type filter media. The waste may include limited amounts of combustible materials (surgical gloves, etc.). Several sizes of filters may be present. This code has not been used since 1975. Since then absolute filters were processed as content codes 338 (insulation and CWS filter media) or 376 (cemented insulation and filter media). Some of the drums may be lead-lined.

The waste cannot be certified due to lack of information about the particulate on the filter media. Gas generation should be negligible. Although there may be some organic material, it should be less than 14 lb/ft3. Significant amounts of respirable fines may be present. No sludges or free liquids should be present. No explosive, pyrophoric, or corrosive materials should be in this waste, except for some residual amounts of nitric acid.

Each filter is double contained in PVC and PE bags and assayed. Up to 12-20 filters are placed in each prepared drum. Small amounts of Oil-Dri are added to drums containing damp filters. Drums were packed according to the usual pre-1972 and post 1972 procedures.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-118-335

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
78	DRUM	16.54	5,500.00	ABSOLUTE 8 X 8 FILTERS
Subtotal	78	16.54	5,500.00	

Total 78**16.54 m3****5,500.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D001	IGNITABLE	OXIDIZERS			10.000
D002	CORROSIVE	ACID			10.000
D022	CHLOROFORM	.	67-66-3		10.000
D028	1,2-DICHLOROETHANE	.	107-06-2		10.000
D029	1,1-DICHLOROETHYLENE	.	75-35-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	150	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	150	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	50	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	ACETONE	67-64-1		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	BENZENE	71-43-2		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		10.000
TSCA	ASBESTOS		1332-21-4	450.000	600.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.40E+02	9.20E+01
Totals		1.40E+02	9.20E+01

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	1.42E-02	1.04E-07	8.27E+00	4.35E-04	8.27E+00	1.55E-07	1.24E+01	6.50E-04	1.24E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
		Misc. Non-Combustible -	
		Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	4.4
		Vermiculite	
		Salts	
		Filters/Insulation -	
		Glass Filter Media	
		Asbestos (filter, insulation)	83.2
		Filter Dust	5.0
		Magnesia (insulations)	
		Inorganic Sludge -	
		Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
		Plastics -	
		Polyethylene	5.9
		Polyvinyl Chloride (PVC)	1.5
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DRI)			4-1
FILTERS (WOOD OR PARTICLE BOARD FRAMES, ASBESTOS)			4-1
ORGANICS	14	LB/FT3	4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-118

FILTERS (a-LLW)

C. Code/Name: 338

INSULATION AND CWS FILTER MEDIA

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of filters (HEPA, absolute, glass, fiberglass, and filter media) that have been removed from incineration processes, scrubbers, offgas systems and intake/exhaust systems. Pipe insulation, asbestos, gloves, fire blankets, etc

Total Volume (m3): 240.74

Gross Mass (kg): 68,700.00

Drum Equivalents: 1,135.56

Physical Form: SOLID

Physical Type: FILTERS, METAL, ABSORBENT MATERIALS, OTHER

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☒ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant, consists of asbestos and fiberglass filter media, asbestos-type pipe insulation, and other materials such as aluminum and wood frames, and compacted insulation waste. Some of the waste may be damp. This code was replaced in 1977 with content code 376 (cemented insulation and filter media).

The waste cannot be certified (for WIPP) due to lack of information about the particulates on the filter media. Gas generation should be negligible. Although there may be some organic material, it should be less than 14 lb/ft³ for drums and 6 lb/ft³ for boxes. Significant amounts of respirable fines may be present. No sludges or free liquids should be present. No explosive, pyrophoric, or corrosive materials should be in the waste, except for some residual amounts of nitric acid.

The waste is contained in drums and boxes. The waste is generally double-contained in either PE or PVC bags or in 1 gallon PE bottles and single or double bags. The bottles were individually assayed. Some pipe insulation may be wrapped with tape, depending on contamination levels, and placed directly into drums. Absorbent was added to some drums containing damp waste. Drums were packed according to the usual pre-1972 and post 1972 procedures. Each drum was assayed. Each box was surveyed to determine a calculated fissile content. Coated and uncoated boxes were prepared according to standard pre-1972 and 1972-1974 procedures.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-118-338

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
44	DRUM	9.33	3,400.00	INSULATION AND CWS FILTER MEDIA
73	BOX	231.41	65,300.00	INSULATION AND CWS FILTER MEDIA
Subtotal 117		240.74	68,700.00	

Total 117	240.74 m3	68,700.00 kg
------------------	------------------	---------------------

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D001	IGNITABLE	OXIDIZERS			10.000
D002	CORROSIVE	ACID			10.000
D022	CHLOROFORM	.	67-66-3		10.000
D028	1,2-DICHLOROETHANE	.	107-06-2		10.000
D029	1,1-DICHLOROETHYLENE	.	75-35-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	150	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	150	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	BENZENE	71-43-2		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		10.000
TSCA	ASBESTOS		1332-21-4	450.000	600.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	6.40E+04	4.40E+04
Totals		6.40E+04	4.40E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	1.06E+01	1.67E-07	1.33E+01	6.99E-04	1.33E+01	2.43E-07	1.94E+01	1.02E-03	1.94E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	4.4
	Filters/Insulation -	Vermiculite	
		Salts	
		Glass Filter Media	42.1
		Asbestos (filter, insulation)	42.1
		Filter Dust	4.0
<u>Partial Combustible</u> (10%-90% Combustible)	Inorganic Sludge -	Magnesia (insulations)	
		Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
		Leaded Rubber	
	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
		Plexiglass	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	5.9
		Polyvinyl Chloride (PVC)	1.5
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (UNKNOWN)			4-1
FILTERS (ASBESTOS AND FIBERGLASS FILTER MEDIA)			4-1
METAL (ALUMINUM FRAMES)			4-1
ORGANICS	6 - 14	LB/FT ³	4-1
WOOD			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-118 FILTERS (a-LLW)

C. Code/Name: 360 INSULATION

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of filters (HEPA, absolute, glass, fiberglass, and filter media) that have been removed from incineration processes, scrubbers, offgas systems and intake/exhaust systems. Pipe insulation, asbestos, gloves, fire blankets, etc

Total Volume (m3): 50.45

Gross Mass (kg): 15,300.00

Drum Equivalents: 237.95

Physical Form: SOLID

Physical Type: FILTERS, METAL, RUBBER, OTHER

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☒ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant, consists of asbestos-type pipe insulation, asbestos gloves and fireblankets, and asbestos and fiberglass prefilter and filter media. The waste may include limited amounts of other materials such as aluminum and wood frames, and compacted insulation waste. Some materials may be damp. The waste may include limited amounts of combustible materials such as surgical gloves. This code has not been used since 1973. Since then absolute filters were processed as content codes 338 (insulation and CWS filter media) or 376 (cemented insulation and filter media).

This waste cannot be certified (for WIPP) due to lack of information about the particulate on the filter media. Gas generation should be negligible. Organic material, should not exceed WIPP-WAC limits. Significant amounts of respirable fines may be present, especially since some of the waste has been reduced to an "oatmeal" consistency from handling. Some waste which was wet was dried in a clothes dryer prior to packaging. No sludges or free liquids should be present. No explosive, pyrophoric, or corrosive materials should be in this waste, except for some residual amounts of nitric acid.

The waste is contained in drums and one box. The waste is generally double-contained in either PE or PVC bags. The bottles were individually assayed. Some pipe insulation may be wrapped with tape, depending on contamination levels, and placed directly into drums. Absorbent was added to some drums containing damp waste. Drums were packed according to the usual pre-1972 and post 1972 procedures. Each drum was assayed. The box was surveyed to determine a calculated fissile content. The time when the box was used is not known. Coated and uncoated boxes were prepared according to standard pre-1972 and 1972-1974 procedures.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-118-360

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	223	DRUM	47.28	14,460.00	INSULATION
	1	BOX	3.17	840.00	INSULATION
Subtotal	224		50.45	15,300.00	

Total	224	50.45 m3	15,300.00 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D001	IGNITABLE	OXIDIZERS			10,000
D002	CORROSIVE	ACID			10,000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	150	10,000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10,000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	150	10,000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	50	10,000
TS&A ASBESTOS			1332-21-4	450,000	600,000

When no Concentration Values are given, please refer to Section 3.7 of this report.

AIM

Association for Information and Image Management

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301/587-8202

Centimeter

Inches

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E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)	
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings		
		Other Glass		
	Metals -	Carbon Steel		
		Stainless Steel		
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal		
		Lead (Bulk Pb)		
	Misc. Non-Combustible -	Other HVPM(Zn,Cd)		
		Ceramic (molds)		
		Firebrick		
		Concrete		
		Portland Cement		
		Dirt/Soil		
		Ash		
		Oil-dri	4.4	
		Vermiculite		
		Salts		
		Filters/Insulation -	Glass Filter Media	42.1
			Asbestos (filter, insulation)	42.1
Filter Dust	4.0			
Magnesia (insulations)				
Inorganic Sludge -	Sludge High Na2O (1st Stage)			
	Sludge High CaO (2nd Stage)			
	Aqueous Solutions			
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber		
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelex/lead		
		Sheetrock		
		Plastics -	Polyethylene	5.9
			Polyvinyl Chloride (PVC)	1.5
			Teflon	0.0
Plexiglass				
Rubber -	Rubber			
	Surgeons' Glove			
Misc. Combustibles -	Graphite (molds)			
	Paper			
	Wood			
	Cardboard			
	Cloth			

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (UNKNOWN)			4-1
METAL (ALUMINUM FRAMES)			4-1
ORGANICS			4-1
OTHER (ASBESTOS INSULATION, GLOVES, & FIREBLANKET)			4-1
RUBBER (SURGICAL GLOVES)			4-1
WOOD			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-118

FILTERS (a-LLW)

C. Code/Name: 376

CEMENTED INSULATION FILTER MEDIA

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of filters (HEPA, absolute, glass, fiberglass, and filter media) that have been removed from incineration processes, scrubbers, offgas systems and intake/exhaust systems. Pipe insulation, asbestos, gloves, fire blankets, etc

Total Volume (m3): 94.74

Gross Mass (kg): 35,900.00

Drum Equivalents: 446.91

Physical Form: SOLID

Physical Type: FILTERS, ABSORBENT MATERIALS

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☒ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant, consists primarily of filter media from pre-filters, absolute filters, etc., and limited amounts of insulation waste such as asbestos gloves and fire blankets. Portland cement is added to neutralize any residual nitric acid and reduce the potential for drum pressurization.

The waste cannot be certified (for WIPP) due to potential for excessive fines. Gas generation should be negligible. Although there may be some organic material, it should be less than 14 lb/ft3 for drums and 6 lb/ft3 for boxes. Significant amounts of respirable fines may be present. No sludges or free liquids should be present. No explosive, pyrophoric, or corrosive materials should be in this waste, except for some residual amounts of nitric acid.

The waste is contained in drums and boxes. Waste generated prior to 1979 is generally double-contained in either PE or PVC bags, 1 gallon PE bottles and/or metal paint cans. Most of this waste was repackaged into 15-gallon plastic bags, after thorough mixing with portland cement. Drums were packed according to the usual post 1972 procedures. Each drum was assayed. Each box was surveyed to determine a calculated fissile content. Boxes were prepared according to standard post 1972 procedures.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-118-376

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
417	DRUM	88.40	32,000.00	CEMENTED INSULATION FILTER MEDIA
2	BOX	6.34	3,900.00	CEMENTED INSULATION FILTER MEDIA
Subtotal	419	94.74	35,900.00	

Total 419**94.74 m3****35,900.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D001	IGNITABLE	OXIDIZERS			10.000
D002	CORROSIVE	ACID			10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	200	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	700	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	50	10.000
TSCA	ASBESTOS		1332-21-4	50.000	100.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.40E+04	8.90E+03
Totals		1.40E+04	8.90E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	1.77E+00	1.30E-07	1.03E+01	5.44E-04	1.03E+01	1.99E-07	1.59E+01	8.36E-04	1.59E+01
U-235	4.00E+00	7.69E-05	0.00E+00	1.48E-01	1.48E-01	1.85E-04	0.00E+00	3.56E-01	3.56E-01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	10.0
		Lead (Bulk Pb)	
		Other HVPM (Zn, Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	10.0
		Dirt/Soil	
		Ash	
		Oil-dri	
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	30.9
		Asbestos (filter, insulation)	30.9
		Filter Dust	1.3
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
	Partially Combustible -	Leaded Rubber	
<u>Partial Combustible</u> (10%-90% Combustible)		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	5.6
		Polyvinyl Chloride (PVC)	1.4
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	10.0
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (PORTLAND CEMENT)			4-1
FILTERS (FILTER MEDIA FROM PRE-FILTERS, ABSOLUTE)			4-1
ORGANICS	6 - 14	LB/FT3	4-1
OTHER (ASBESTOS GLOVES AND FIREBLANKETS)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-118

FILTERS (a-LLW)

C. Code/Name: 490

CWS FILTERS

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of filters (HEPA, absolute, glass, fiberglass, and filter media) that have been removed from incineration processes, scrubbers, offgas systems and intake/exhaust systems. Pipe insulation, asbestos, gloves, fire blankets, etc

Total Volume (m3): 873.45

Gross Mass (kg): 230,680.02

Drum Equivalents: 4,120.03

Physical Form: SOLID

Physical Type: FILTERS, METAL, ABSORBENT MATERIALS

PCBs: ☐**Combustibility:**

- ☐ Combustible (>90%)
☒ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW**Rad. Level**☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant, consists primarily of whole HEPA filters, absolute filters, CWS (chemical warfare service) filters, and prefilters. The filter frames are usually wood, but a limited number are aluminum. The filter media is asbestos-type and fiberglass-type (nomex).

The waste cannot be certified (for WIPP) due to lack of information about the particulate on the filter media. Gas generation should be negligible. Although there may be some organic material, it should be less than 14 lb/ft3 for drums and 6 lb/ft3 for boxes. Significant amounts of respirable fines may be present. No sludges or free liquids should be present. No explosive, pyrophoric, or corrosive materials should be in the waste, except for some residual amounts of nitric acid.

The waste is contained in drums and boxes. Drums should be similar to content code 335 drums. Each filter was generally double-contained in either PE or PVC bags, and then placed in prepared drums. Each drum was assayed. Drums of code 490 waste have not been shipped to INEL since 1975. Boxes contain filters which are single or double-contained in plastic bags, along with their original, cardboard shipping boxes. In boxes prepared after 1974, the boxes are flattened and the filters are crushed. About 12 uncrushed or 25-30 crushed HEPA filters will fit into a box. Portland cement and Oil-Dri were typically added to any containers which contained damp filters.

Drums and boxes were prepared and packed according to the usual pre-1972 and post 1972 procedures. Each drum was assayed. Each box was surveyed using the cumulative assay value of the individual filters, determined from drum assays. One box which was shipped in 1972 is apparently mislabeled, and is believed to contain metal waste.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-118-490

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	8	DRUM	1.70	680.00	CWS FILTERS
	275	BOX	871.75	230,000.02	CWS FILTERS
Subtotal	283		873.45	230,680.02	

Total 283**873.45 m3****230,680.02 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D001	IGNITABLE	OXIDIZERS			10.000
D002	CORROSIVE	ACID			10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-35-6	150	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	150	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	50	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	2.20E+05	1.50E+05
Totals		2.20E+05	1.50E+05

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design I Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	6.85E+01	3.13E-07	2.49E+01	1.31E-03	2.49E+01	4.58E-07	3.65E+01	1.92E-03	3.65E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	36.0
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	2.0
		Vermiculite	2.0
		Salts	
	Filters/Insulation -	Glass Filter Media	11.0
		Asbestos (filter, insulation)	11.0
		Filter Dust	2.0
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	5.6
		Polyvinyl Chloride (PVC)	1.4
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	2.0
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	25.0
		Cardboard	2.0
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENTS (OIL-DRI)			4-1
ABSORBENTS (PORTLAND CEMENT)			4-1
FILTERS (HEPA, ABSOLUTE, CWS, PREFILTERS)			4-1
METAL (ALUMINUM FILTER FRAMES)			4-1
ORGANICS	6-14	LB/FT3	4-1
OTHER (FILTER MEDIA IS ASBESTOS & FIBERGLASS TYPE)			4-1
WOOD (FILTER FRAMES)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-119

GLASS (a-LLW)

C. Code/Name: 118

CERTIFIED TRU GLASS WASTE

B. DESCRIPTION**INEL ID (WMIS) Description:**

Discarded labware, windows, containers, and raschig rings.

Total Volume (m3): 6.35

Gross Mass (kg): 3,600.00

Drum Equivalents: 29.95

Physical Form: SOLID

Physical Type: GLASS

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

Certified TRU (for WIPP) glass waste consists of discarded labware, windows, containers or raschig rings from various processes. The content codes certifiably packaged and renamed 119 are 370, 440, and 442.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-119-118

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
15	DRUM	3.18	1,800.00	CERTIFIED TRU GLASS WASTE
1	BOX	3.17	1,800.00	CERTIFIED TRU GLASS WASTE
Subtotal	16	6.35	3,600.00	

Total 16**6.35 m3****3,600.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID			10.000
D008	LEAD		7439-92-1		10.000
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		260
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	3.60E+03	2.90E+03
Totals		3.60E+03	2.90E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	6.27E-01	1.75E-07	1.39E+01	7.33E-04	1.39E+01	2.15E-07	1.72E+01	9.02E-04	1.72E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	1.2
		Other Glass	87.7
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	0.3
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	3.3
		Vermiculite	1.0
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benolex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	4.8
		Polyvinyl Chloride (PVC)	1.2
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	0.2
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	0.3
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
GLASS (GLASSWARE, WINDOWS, RASCHIG RINGS)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-119 GLASS (a-LLW)

C. Code/Name: 440 GLASS

B. DESCRIPTION**INEL ID (WMIS) Description:**

Discarded labware, windows, containers, and raschig rings.

Total Volume (m3): 95.40

Gross Mass (kg): 48,000.00

Drum Equivalents: 450.00

Physical Form: SOLID

Physical Type: GLASS, ABSORBENT MATERIALS, METAL, OTHER, PLASTIC

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant, consists of glass sample vials, bottles, lead-taped sample vials, ion exchange columns, dissolver pots, laboratory glassware such as pyrex flasks and beakers, glovebox windows (glass, plexiglass, leaded glass), and crushed and ground glass. The waste includes limited amounts of other noncombustibles such as metals, and limited amounts of combustible wastes. Gas generation should be negligible. No sludges should be present although some glass vials may contain limited amounts of free liquids. No explosive, pyrophoric, or corrosive materials should be in the waste.

The majority of drums are certifiable although drums containing respirable crushed glass fines or free liquids are not certifiable (for WIPP) until actual amounts are determined.

The glass may be packaged with some variation depending on if it is whole, broken to pieces, or crushed or ground. Whole or broken glass may be packaged in 1-gallon PE bottles, in 13 inch high by 15.5 inch diameter Fibre-Paks (either loose or inside plastic bags inside the Fibre-Pak), or double-packed in plastic bags, with the outside of the outer bag taped for protection against sharp edges. Glassware such as sample vials may be taped together before packaging. Nonline generated glassware, light bulbs and fluorescent tubes are usually crushed or ground and placed directly into a prepared 55-gallon drum. Drums were packed according to the usual pre-1972 and post 1972 procedures. Specific information on the box preparation was not available.

Each drum was assayed. Since 1972, the drums were also processed according to inspection and sealing procedures, and, since 1982, vermiculite instead of Oil-Dri was placed on top of the outer sealed PE drum bag. A small number of the drums are lead-lined. Also, Oil-Dri was added to the glass waste if moisture was present.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-119-440

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	450	DRUM	95.40	48,000.00	GLASS
Subtotal	450		95.40	48,000.00	

Total 450**95.40 m3****48,000.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID			10.000
D008	LEAD		7439-92-1		10.000
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		10.000
D029	1,1-DICHLOROETHYLENE		75-35-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	2.00E+03	1.60E+03
Totals		2.00E+03	1.60E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	4.01E-01	2.03E-07	1.62E+01	8.51E-04	1.62E+01	2.45E-07	1.95E+01	1.03E-03	1.95E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	1.2
		Other Glass	87.7
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	0.3
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	3.3
		Vermiculite	1.0
		Salts	
		Filters/Insulation -	Glass Filter Media
Asbestos (filter, insulation)			
Filter Dust			
Inorganic Sludge -		Magnesia (insulations)	
		Sludge High Na2O (1st Stage)	
	Sludge High CaO (2nd Stage)		
	Aqueous Solutions		
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
		<u>Combustibles</u> (>90% Combustible)	Plastics -
Polyvinyl Chloride (PVC)	1.2		
Teflon	0.0		
Plexiglass			
Rubber -	Rubber		0.2
	Surgeons' Glove		
Misc. Combustibles -	Graphite (molds)		
	Paper		0.3
	Wood		
	Cardboard		
			Cloth

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)			4-1
GLASS(GLASSWARE, LEAD TAPED VIALS, CRUSHED, GROUND)			4-1
METAL			4-1
OTHER (COMBUSTIBLE WASTES)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-119

GLASS (a-LLW)

C. Code/Name: 441

UNLEACHED RASHIG RINGS

B. DESCRIPTION**INEL ID (WMIS) Description:**

Discarded labware, windows, containers, and raschig rings.

Total Volume (m3): 164.72

Gross Mass (kg): 67,000.00

Drum Equivalents: 777.00

Physical Form: SOLID

Physical Type: GLASS, ABSORBENT MATERIALS

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant, consists of boronated glass rings used to minimize neutron multiplication in liquid storage tanks. Content Code 441, Unleached Rashig Rings was used from 1971-79 as a separate stream, and then combined with content code 442, Leached Rashig Rings. The rings are about 1.75 inch high and 1.5 inch in diameter, with a 0.25 inch wall thickness. The rings are heat and chemical resistant borosilicate glass with 11.8 - 13.8 weight % B₂O₃, with an isotopic content of 10B/11B of not less than 0.24. Some of the rings, which had above-discard amounts of plutonium, were leached with nitric acid to recover the plutonium and then rinsed with water, and dried. Some of the rings may be contaminated with small amounts of oil.

The waste is certifiable (for WIPP). Gas generation potential should be negligible. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in the waste. Trace amounts of nitric acid or organic contaminants may be present.

The rings are triple contained in PE or PVC and placed in a 10 inch high, 15.5 inch diameter Fibre-Pak. Two Fibre-Paks are placed inside a prepared 55-gallon drum according to the standard pre-1972 and post-1972 drum packing procedures. A few of the drums contain broken rashig rings in taped closed, 4 liter PE bottles with double bags inside the bottles.

Each drum was assayed. Since 1972, the drums were also processed according to inspection and sealing procedures, and, since 1982, vermiculite instead of Oil-dri was placed on top of the outer sealed PE drum bag. A small number of the drums are lead-lined. Also, Oil-dri, was added to the glass waste if moisture was present.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-119-441

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
777	DRUM	164.72	67,000.00	UNLEACHED RASHIG RINGS
Subtotal 777		164.72	67,000.00	

Total 777	164.72 m3	67,000.00 kg
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1. Values in this table represent actual quantities in storage.
2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D001	IGNITABLE	OXIDIZERS			10.000
D002	CORROSIVE	ACID			10.000
D008	LEAD		7439-92-1		10.000
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	2.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	750	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	55.1
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
		Ceramic (molds)	
	Misc. Non-Combustible -	Firebrick	
		Concrete	
		Portland Cement	0.1
		Dirt/Soil	
		Ash	
		Oil-dri	36.4
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
		Leaded Rubber	
	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	1.4
		Polyvinyl Chloride (PVC)	0.4
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	6.6
		Wood	
		Cardboard	
		Cloth	0.0

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)			4-1
B ₂ O ₃	11.8 -13.8	% WT	4-1
GLASS (BORONATED GLASS RINGS)			4-1
NITRIC ACID			4-1
ORGANICS			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-119

GLASS (a-LLW)

C. Code/Name: 442

LEACHED RASHIG RINGS

B. DESCRIPTION**INEL ID (WMIS) Description:**

Discarded labware, windows, containers, and rashig rings.

Total Volume (m3): 138.44

Gross Mass (kg): 55,000.00

Drum Equivalents: 653.00

Physical Form: SOLID

Physical Type: GLASS, ABSORBENT MATERIALS

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant, consists of boronated glass rings used to minimize neutron multiplication in liquid storage tanks. Content code 441, unleached rashig rings were used from 1971-79 as a separate stream, and then combined with content code 442, leached rashig rings. The rings are about 1.75 inch high and 1.5 inch in diameter, with a 0.25 inch wall thickness. The rings are heat and chemical resistant borosilicate glass with 11.8 - 13.8 weight % B2O3, with an isotopic content of 108/118 of not less than 0.24. Some of the rings, which had above-discard amounts of plutonium, were leached with nitric acid to recover the plutonium and then rinsed with water, and dried. Some of the rings may be contaminated with small amounts of oil.

The waste is certifiable (for WIPP). Gas generation potential should be negligible. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in the waste. Trace amounts of nitric acid or organic contaminants may be present.

The rings are triple contained in PE or PVC and placed in a 10 inch high, 15.5 inch diameter Fibre-Pak. Two Fibre-Paks are placed inside a prepared 55-gallon drum according to the standard pre-1972 and post-1972 drum packing procedures. A few of the drums contain broken rashig rings in taped closed, 4 liter PE bottles with double bags inside the bottles.

Each drum was assayed. Since 1972, the drums were also processed according to inspection and sealing procedures, and, since 1982, vermiculite instead of oil-dri was placed on top of the outer sealed PE drum bag. A small number of the drums are lead-lined. Also, oil-dri, was added to the glass waste if moisture was present.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-119-442

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	653	DRUM	138.44	55,000.00	LEACHED RASHIG RINGS
Subtotal	653		138.44	55,000.00	

Total 653**138.44 m3****55,000.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volume.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID			10.000
D008	LEAD	.	7439-92-1		10.000
D028	1,2-DICHLOROETHANE	.	107-06-2		10.000
D029	1,1-DICHLOROETHYLENE	.	75-35-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	ACETONE	67-64-1		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	BENZENE	71-43-2		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	8.40E+02	8.80E+02
Totals		8.40E+02	8.80E+02

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database accumulations for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	2.10E-01	2.50E-07	1.99E+01	1.05E-03	1.99E+01	3.18E-07	2.54E+01	1.33E-03	2.54E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)	
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	74.5	
		Other Glass		
	Metals -	Carbon Steel		
		Stainless Steel		
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal		
		Lead (Bulk Pb)		
	Misc. Non-Combustible -	Other HVPM(Zn,Cd)		
		Ceramic (molds)		
		Firebrick		
		Concrete		
		Portland Cement		
		Dirt/Soil		
		Ash		
		Oil-dri	5.1	
		Vermiculite	5.5	
		Salts		
	Filters/Insulation -	Glass Filter Media		
		Asbestos (filter, insulation)		
		Filter Dust		
		Magnesia (insulations)		
	Inorganic Sludge -	Sludge High Na2O (1st Stage)		
Sludge High CaO (2nd Stage)				
Aqueous Solutions				
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber		
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelex/lead		
		Sheetrock		
		Plastics -	Polyethylene	3.7
			Polyvinyl Chloride (PVC)	0.9
			Teflon	0.0
<u>Combustibles</u> (>90% Combustible)	Rubber -	Plexiglass		
		Rubber		
		Surgeons' Glove		
	Misc. Combustibles -	Graphite (molds)		
		Paper	10.2	
		Wood		
		Cardboard		
		Cloth		

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)			4-1
8203	11.8-13.8	% WT	4-1
GLASS (BORONATED GLASS RINGS)			4-1
PLASTIC (PE BOTTLES)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-120

GLOVEBOX GLOVES (a-LLW)

C. Code/Name: 123

CERTIFIED TRU LEADED RUBBER

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of leaded glovebox gloves and aprons. The waste may contain limited amounts of unleaded gloves, lead bricks, and lead sheeting.

Total Volume (m3): 2.33

Gross Mass (kg): 1,200.00

Drum Equivalents: 11.00

Physical Form: SOLID

Physical Type: RUBBER, METAL, PLASTIC

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☒ Partially Combustible (10%-90%)☐ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

Certified (for WIPP) TRU leaded rubber waste consists of discarded leaded glovebox gloves and leaded aprons. The content codes certifiably packaged and renamed 123 are 339 and 463.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-120-123

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	11	DRUM	2.33	1,200.00	CERTIFIED TRU LEADED RUBBER
Subtotal	11		2.33	1,200.00	

Total 11**2.33 m3****1,200.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2	100.000	200.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	1.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	1.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6	1.000	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	1.000	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.20E+03	8.20E+02
Totals		1.20E+03	8.20E+02

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	1.63E-01	1.41E-07	1.12E+01	5.91E-04	1.12E+01	1.98E-07	1.58E+01	8.32E-04	1.58E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
		Misc. Non-Combustible -	
		Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	2.3
		Vermiculite	2.0
		Salts	
		Filters/Insulation -	
		Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
		Inorganic Sludge -	
		Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	90.2
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
		Plastics -	
<u>Combustibles</u> (>90% Combustible)		Polyethylene	2.1
		Polyvinyl Chloride (PVC)	0.5
		Teflon	0.0
		Plexiglass	
		Rubber -	2.0
		Surgeons' Glove	
		Misc. Combustibles -	
		Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	0.8

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
1,1,1-TRICHLOROETHANE (TCA)	0.1	% WT	4-7
CARBON TETRACHLORIDE	0.1	% WT	4-7
LEAD	10	% WT	4-1, 2, 7
METHYLENE CHLORIDE	0.1	% WT	4-7
RUBBER (LEADED GLOVES & APRONS)			4-1
TRICHLOROETHYLENE (TCE)	0.1	% WT	4-7

A. IDENTIFICATION

INEL ID/Name: ID-EGG-120

GLOVEBOX GLOVES (a-LLW)

C. Code/Name: 339

LEADED RUBBER GLOVES AND APRONS

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of leaded glovebox gloves and aprons. The waste may contain limited amounts of unleaded gloves, lead bricks, and lead sheeting.

Total Volume (m3): 4.88

Gross Mass (kg): 3,400.00

Drum Equivalents: 23.00

Physical Form: SOLID

Physical Type: RUBBER, METAL, PLASTIC

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☒ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste comes from the Rocky Flats Plant. It consists of leaded rubber gloves and aprons. A limited amount of unleaded gloves, lead bricks, and lead sheeting may also be present. Content code 463 was replaced by content code 339 in 1973. Waste is packaged in standard RFP fashion. Lead linings are present on some drums.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-120-339

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	23	DRUM	4.88	3,400.00	LEADED RUBBER GLOVES AND APRONS
Subtotal	23		4.88	3,400.00	

Total 23**4.88 m3****3,400.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2	560.000	600.000
D022	CHLOROFORM	.	67-66-3		10.000
D028	1,2-DICHLOROETHANE	.	107-06-2		10.000
D029	1,1-DICHLOROETHYLENE	.	75-35-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	ACETONE	67-64-1		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	ETHYL BENZENE	100-41-4		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	BENZENE	71-43-2		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	105-68-3		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

1.1
1.1.1

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Julk Pb)	
		Other HVPIM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	2.3
		Vermiculite	2.0
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
	Inorganic Sludge -	Magnesia (insulations)	
		Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	90.2
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benolac/foed	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	2.1
		Polyvinyl Chloride (PVC)	0.5
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	2.0
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	0.8

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
CLOTHING (GLOVES)			4-1
LEAD (BRICKS, SHEETING)			4-1, 2
RUBBER (LEADED GLOVES AND APRONS)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-120

GLOVEBOX GLOVES (a-LLW)

C. Code/Name: 463

LEADED RUBBER GLOVES AND APRONS

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of leaded glovebox gloves and aprons. The waste may contain limited amounts of unleaded gloves, lead bricks, and lead sheeting.

Total Volume (m3): 1.06

Gross Mass (kg): 470.00

Drum Equivalents: 5.00

Physical Form: SOLID

Physical Type: RUBBER, METAL, PLASTIC

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☒ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste comes from the Rocky Flats Plant. It consists of leaded rubber gloves and aprons. A limited amount of unleaded gloves, lead bricks, and lead sheeting may also be present. Content code 463 was replaced by content code 339 in 1973. Waste is packaged in standard RFP fashion. Lead linings are present on some drums.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-120-463

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	5	DRUM	1.06	470.00	LEADED RUBBER GLOVES AND APRONS
Subtotal	5		1.06	470.00	

Total	5	1.06 m3	470.00 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

FION

ID-EGG

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D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2	560.000	600.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
<u>Partial Combustible</u> (10%-90% Combustible)	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	2.3
	Filters/Insulation -	Vermiculite	2.0
		Salts	
		Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
		Sludge High Na2O (1st Stage)	
<u>Combustibles</u> (>90% Combustible)	Inorganic Sludge -	Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
	Partially Combustible -	Leaded Rubber	90.2
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	2.1
		Polyvinyl Chloride (PVC)	0.5
		Teflon	0.0
	Rubber -	Plexiglass	
		Rubber	2.0
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	0.8

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
CLOTHING (GLOVES)			4-1
LEAD			4-1
RUBBER (LEADED GLOVES AND APRONS)			4-1, 2

A. IDENTIFICATIONINEL ID/Name: **ID-EGG-127** TRA SCINTILLATION COCKTAILS (ALPHA LLW)

C. Code/Name: *

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of scintillation cocktails and solvent extraction waste generated from experiments. This waste is 49% water and 49% xylene. It is contaminated with low-level alpha emitters and some beta, gamma activity due to radiotracers. In addition to the radionuclides reported, the total actinides are 3.9 E-9 Ci/g.

Total Volume (m3): .32

Gross Mass (kg): 90.72

Drum Equivalents: 1.52

Physical Form: LIQUID

Physical Type: NONWASTEWATER.

PCBs: ☐

Combustibility:

- ☒ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled

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INEL Waste Profile Sheet

ALLMW

ID-EGG-127-*

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	DM	0.11	22.68	ALSO CONTAINS COMBUSTIBLE LIQUID AND CADMIUM
1	DM	0.21	68.04	TRA COMBUSTIBLE LIQUID
Subtotal	2	0.32	90.72	

Total	2	.32 m3	90.72 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID			10.000
D006	CADMIUM	.	7440-43-9	10	10.000
D022	CHLOROFORM	.	67-66-3	282	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	120.000	150.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

U-235

U-238

F. Design Basis Bulk Waste Materials**WASTE MATRIX CONSTITUENTS**

When no data are available, please refer to Section 3.7 of this report.

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
CADMIUM	7.5	PPM	4-6
CHLOROFORM	282	PPM	4-6
XYLENE	35	% VOL	4-6

A. IDENTIFICATION

INEL ID/Name: ID-EGG-132

METALS (a-LLW)

C. Code/Name: 20

NONCOMPRESSIBLE, NONCOMBUSTIBLE

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of LLW scrap from line and non-line generated metal wastes, cut-up glove boxes, process equipment, machinery, motors, pumps, tools, tanks, and scrap from cleanup projects.

Total Volume (m3): 62.33

Gross Mass (kg): 31,500.00

Drum Equivalents: 294.00

Physical Form: SOLID

Physical Type: METAL, FILTERS, CONTAMINATED EQUIPMENT

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream, generated at Bettis Atomic Power Laboratory, contains noncompressible and noncombustible items such as absolute filters, solidified chemical waste, contaminated metal equipment, furnace brick, and highly contaminated glovebox equipment. Metal scrap could include bars, sheet, fixtures, small equipment tools, etc. made of carbon steel, stainless steel, inconnel, aluminum, copper, brass, and zirconium. Chemical wastes include spent chemical solutions and associated solids from the isotope and isotopic dilution analysis of nuclear fuel specimens. The residues were neutralized before being either mixed with absorbent material or solidified.

The waste is WIPP certifiable. Gas generation potential should be acceptable, since the organic content is less than 14 lb/ft³. Although there may be some particulate material in the waste from absolute filters, the levels of dispersible fines should be within WIPP-WAC limits. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in the waste. Trace amounts of nitric acid or organic contaminants may be present.

Individual waste items are separately packaged in plastic wrapping. Depending on size, some wrapped items are placed in (a) 3-1/4 inch diameter by 7 inches high screw-top, tin-plated steel cans, placed inside roll-seamed juice cans, or (b) larger 4-3/8 inch diameter by 20-24 inch high tin-plated steel cans. Chemical solutions are neutralized to a Ph between 6-8 and mixed with "absorbal" in PE bottles or solidified in metal cans (which are wrapped in plastic.) These items are then placed inside prepared 55-gallon drums lined with 90-mil liners. Each drum was assayed by calculated weight differences, chemical analysis, or using an assay gauge.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

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INEL Waste Profile Sheet

ALLMW

ID-EGG-132-20

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
294	DRUM	62.33	31,500.00	NONCOMPRESSIBLE, NONCOMBUSTIBLE
Subtotal 294		62.33	31,500.00	

Total 294**62.33 m3****31,500.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volume.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID		1.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	75	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-09-2	200	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	5.70E+04	4.50E+04
Totals		5.70E+04	4.50E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
TH-232	2.29E+06	4.04E-02	0.00E+00	1.12E+01	1.12E+01	5.11E-02	0.00E+00	1.42E+01	1.42E+01
U-233	7.63E+03	1.35E-04	0.00E+00	1.31E+03	1.31E+03	1.71E-04	0.00E+00	1.65E+03	1.65E+03

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)		
<u>Non-Combustible</u> ($<10\%$ Combustible)	Glass -	Glass Rasching Rings			
		Other Glass	17.9		
	Metals -	Carbon Steel	43.1		
		Stainless Steel			
		Aluminum (AL)			
		Tantalum 10W			
		Miscellaneous Metal	0.1		
		Lead (Bulk Pb)	5.5		
		Other HVPM(Zn,Cd)	0.0		
	Misc. Non-Combustible -	Ceramic (molds)			
		Firebrick			
		Concrete			
		Portland Cement			
		Dirt/Soil			
		Ash			
		Oil-dri			
		Vermiculite			
		Salts			
		Filters/Insulation -	Glass Filter Media		
Asbestos (filter, insulation)					
Filter Dust					
Inorganic Sludge -	Magnesia (insulations)				
	Sludge High Na2O (1st Stage)				
	Sludge High CaO (2nd Stage)				
	Aqueous Solutions				
	<u>Partial Combustible</u> ($10\%-90\%$ Combustible)	Partially Combustible -	Leaded Rubber		
Organic Sludge					
Uncemented Resin					
Cemented Resin					
Asphalt					
Benelex/lead					
Sheetrock			26.5		
Plastics -			Polyethylene	0.3	
			Polyvinyl Chloride (PVC)	0.1	
			Teflon	0.0	
<u>Combustibles</u> ($>90\%$ Combustible)			Plastics -	Plexiglass	
				Rubber -	
			Rubber -	Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)			
		Paper	1.4		
		Wood			
		Cardboard	5.0		
		Cloth			

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (ABSORBAL)			4-1
CERAMIC (FURNACE BRICK)			4-1, 2
FILTERS (ABSOLUTE)			4-1, 2
METAL (BARS, SHEET, FIXTURES, TOOLS)			4-1, 2
ORGANICS	14	LB/FT3	4-1
OTHER (SOLIDIFIED CHEMICAL WASTE)			4-1, 2
OTHER (SPENT CHEMICAL SOLUTIONS)			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-132

METALS (a-LLW)

C. Code/Name: 117

CERTIFIED TRU METAL WASTE

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of LLW scrap from line and non-line generated metal wastes, cut-up glove boxes, process equipment, machinery, motors, pumps, tools, tanks, and scrap from cleanup projects.

Total Volume (m3): 147.54

Gross Mass (kg): 62,300.00

Drum Equivalents: 695.92

Physical Form: SOLID

Physical Type: METAL

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

Certified TRU metal waste consists of discarded metal. The content codes certifiably packaged and renamed 117 are 320 and 480. The two content codes are included in either the metal or special metal category.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

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INEL Waste Profile Sheet

ALLMW

ID-EGG-132-117

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
38	DRUM	8.06	4,300.00	CERTIFIED TRU METAL WASTE
44	BOX	139.48	58,000.00	CERTIFIED TRU METAL WASTE
Subtotal 82		147.54	62,300.00	

Total 82**147.54 m3****62,300.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD		7439-92-1	100.000	500.000
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2	100.000	500.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	10.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	10.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	10.000	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	10.000	10.000
P015	BERYLLIUM DUST		7440-41-7	5.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6	1.000	10.000
D028	1,2-DICHLOROETHANE		107-6-2	1.000	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	6.60E+04	5.50E+04
Totals		6.60E+04	5.50E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	1.50E+01	2.26E-07	1.80E+01	9.47E-04	1.80E+01	2.72E-07	2.17E+01	1.14E-03	2.17E+01
U-235	2.20E+01	4.04E-06	0.00E+00	7.77E-03	7.77E-03	4.85E-06	0.00E+00	9.32E-03	9.32E-03

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	12.5
		Stainless Steel	31.1
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	41.4
	Misc. Non-Combustible -	Lead (Bulk Pb)	0.8
		Other HVPM(Zn,Cd)	0.0
		Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	1.5
		Dirt/Soil	
		Ash	
		Oil-dri	3.2
		Vermiculite	4.5
Salts			
Filters/Insulation -	Glass Filter Media		
	Asbestos (filter, insulation)		
	Filter Dust		
	Magnesia (insulations)		
Inorganic Sludge -	Sludge High Na2O (1st Stage)		
	Sludge High CaO (2nd Stage)		
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Aqueous Solutions	
		Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	3.8
		Polyvinyl Chloride (PVC)	1.0
		Teflon	0.0
	Rubber -	Plexiglass	
Rubber			
Misc. Combustibles -	Surgeons' Glove		
	Graphite (molds)		
	Paper	0.0	
	Wood		
	Cardboard		
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
1,1,1-TRICHLOROETHANE (TCA)	1	% WT	4-1, 2, 7
1,1,2-TRICHLORO 1,2,2-TRIFLUOROETHANE (FREON)	1	% WT	4-1, 2, 7
BERYLLIUM	FEW	% WT	4-7
CARBON TETRACHLORIDE	1	% WT	4-1, 2, 7
DICHLOROETHANE	0.1	% WT	4-7
LEAD	10	% WT	4-1, 2, 7
METAL (DISCARDED METAL)			4-1
METHYLENE CHLORIDE	1	% WT	4-1, 2, 7
TRICHLOROETHYLENE (TCE)	0.1	% WT	4-7

A. IDENTIFICATIONINEL ID/Name: **ID-EGG-132** METALS (a-LLW)C. Code/Name: **320** TANTALUM**B. DESCRIPTION****INEL ID (WMIS) Description:**

Waste consists of LLW scrap from line and non-line generated metal wastes, cut-up glove boxes, process equipment, machinery, motors, pumps, tools, tanks, and scrap from cleanup projects.

Total Volume (m3): 28.62

Gross Mass (kg): 17,000.00

Drum Equivalents: 135.00

Physical Form: SOLID

Physical Type: METAL

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste comes from the Rocky Flats Plant. It consists of used tantalum crucibles, funnels, funnel inserts, and pour-rods. The waste is packaged in standard RFP fashion. Sharp metal edges are taped before packaging. Some lead-lined containers are included.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-132-320

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	135	DRUM	28.62	17,000.00	TANTALUM
Subtotal	135		28.62	17,000.00	

Total 135**28.62 m3****17,000.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD		7439-92-1	50.000	100.000
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2	50.000	100.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	15	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	75	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	10	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	200	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.40E+03	1.20E+03
Totals		1.40E+03	1.20E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	2.27E-01	1.62E-07	1.29E+01	6.80E-04	1.29E+01	1.97E-07	1.57E+01	8.27E-04	1.57E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	25.5
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	18.7
		Miscellaneous Metal	37.5
		Lead (Bulk Pb)	3.8
		Other HVPM(Zn,Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	2.0
		Vermiculite	6.1
		Salts	
		Glass Filter Media	
<u>Partial Combustible</u> (10%-90% Combustible)	Filters/Insulation -	Asbestos (filter, insulation)	
		Filter Dust	
	Inorganic Sludge -	Magnesia (insulations)	
		Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Bonalex/lead	
		Sheetrock	
	Plastics -	Polyethylene	3.7
		Polyvinyl Chloride (PVC)	0.9
		Teflon	0.0
		Plexiglass	
<u>Combustibles</u> (>90% Combustible)	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	1.7
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
METAL (TANTALUM CRUCIBLES, FUNNELS, FUNNEL INSERT)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-132

METALS (a-LLW)

C. Code/Name: 480

NON-SPECIAL SOURCE METAL

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of LLW scrap from line and non-line generated metal wastes, cut-up glove boxes, process equipment, machinery, motors, pumps, tools, tanks, and scrap from cleanup projects.

Total Volume (m3): 6,688.03

Gross Mass (kg): 2,572,000.17

Drum Equivalents: 31,547.33

Physical Form: SOLID

Physical Type: METAL, CONTAMINATED EQUIPMENT, OTHER

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

The waste comes from the Rocky Flats Plant. It consists of nonline-and line-generated wastes. The waste may be in the form of gloveboxes, glovebox windows, furnaces, lathes, drill presses, ducting, piping, angle iron, tanks, downdraft tables, part carriers, respirator filters, ultrasonic cleaners, control panels, electronic instrumentation, vacuum sweepers, pumps, motors, railing, stairs, metal racks and trays, hotplates, empty metal produce and paint cans, carts, power tools (saws, drills, etc.), hand tools (wrenches, hammers, saws, chisels, gauges, etc.), chairs, desks, tables, typewriters, filing cabinets, crushed 55-gallon drums, etc. The waste may also include limited amounts of combustible wastes. The waste is packaged in standard RFP fashion. Sharp metal edges are taped before packaging. Some lead lined containers are included.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-132-480

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1537	DRUM	325.84	170,000.01	NON-SPECIAL SOURCE METAL
2007	BOX	6,362.19	2,402,000.16	NON-SPECIAL SOURCE METAL
Subtotal	3544	6,688.03	2,572,000.17	

Total 3,544**6,688.03 m3****2,572,000.17 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD	.	7439-92-1	50.000	100.000
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2	50.000	100.000
D028	1,2-DICHLOROETHANE	.	107-06-2		10.000
D029	1,1-DICHLOROETHYLENE	.	75-35-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	15	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	75	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	10	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	200	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	ACETONE	67-64-1		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	ETHYL BENZENE	100-41-4		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	BENZENE	71-43-2		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.90E+06	1.40E+06
Totals		1.90E+06	1.40E+06

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	4.04E+02	2.17E-07	1.73E+01	9.11E-04	1.73E+01	2.80E-07	2.23E+01	1.17E-03	2.23E+01
U-233	2.40E+02	1.11E-04	0.00E+00	1.08E+03	1.08E+03	1.51E-04	0.00E+00	1.46E+03	1.46E+03
U-235	6.00E+00	4.27E-06	0.00E+00	8.21E-03	8.21E-03	5.33E-06	0.00E+00	1.03E-02	1.03E-02

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	0.2
		Other Glass	0.7
	Metals -	Carbon Steel	58.1
		Stainless Steel	8.0
		Aluminum (AL)	
		Tantalum 10W	0.6
		Miscellaneous Metal	19.4
		Lead (Bulk Pb)	3.8
		Other HVPM (Zn,Cd)	0.0
		Misc. Non-Combustible -	0.6
		Ceramic (molds)	
		Firebrick	
		Concrete	0.1
		Portland Cement	
		Dirt/Soil	0.6
		Ash	
		Oil-dri	0.9
		Vermiculite	0.3
		Salts	
		Filters/Insulation -	0.6
		Glass Filter Media	
		Asbestos (filter, insulation)	0.6
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
		Partially Combustible -	0.1
<u>Partial Combustible</u> (10%-90% Combustible)		Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelox/lead	
		Sheetrock	
		Plastics -	2.8
<u>Combustibles</u> (>90% Combustible)		Polyethylene	
		Polyvinyl Chloride (PVC)	0.6
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	0.0
		Surgeons' Glove	0.0
	Misc. Combustibles -	Graphite (molds)	
		Paper	2.0
		Wood	0.1
		Cardboard	
		Cloth	0.0

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
COMBUSTIBLES			4-1
METAL (CANS, HAND TOOLS, POWER TOOLS)			4-1
METAL (EQUIPMENT, GLOVEBOXES, INSTRUMENTATION)			4-1
OTHER (CHAIRS, DESKS, TABLES, FILING CABINETS)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-132

METALS (a-LLW)

C. Code/Name: 481

LEACHED NONSPECIAL SOURCE METAL

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of LLW scrap from line and non-line generated metal wastes, cut-up glove boxes, process equipment, machinery, motors, pumps, tools, tanks, and scrap from cleanup projects.

Total Volume (m3): 164.33

Gross Mass (kg): 71,000.00

Drum Equivalents: 775.16

Physical Form: SOLID

Physical Type: METAL, OTHER

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste comes from the Rocky Flats Plant. It consists of the smaller pieces of the waste described under content code 480 that have been washed with hot water to recover plutonium. The waste is packaged in standard RFP fashion. Sharp metal edges are taped before packaging. Some lead-lined containers are included.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-132-481

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
192	DRUM	40.70	24,000.00	LEACHED NONSPECIAL SOURCE METAL
39	BOX	123.63	47,000.00	LEACHED NONSPECIAL SOURCE METAL
Subtotal	231	164.33	71,000.00	

Total 231**164.33 m3****71,000.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD	.	7439-92-1	50.000	100.000
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2	50.000	100.000
D022	CHLOROFORM	.	67-66-3		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	15	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	75	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	10	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	200	10.000
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	4.80E+04	3.70E+04
Totals		4.80E+04	3.70E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	8.31E+00	1.74E-07	1.39E+01	7.29E-04	1.39E+01	2.26E-07	1.80E+01	9.46E-04	1.80E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)	
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings		
		Other Glass		
	Metals -	Carbon Steel	12.5	
		Stainless Steel	31.1	
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal	41.4	
		Lead (Bulk Pb)	0.8	
		Other HVPM(Zn,Cd)	0.0	
	Misc. Non-Combustible -	Ceramic (molds)		
		Firebrick		
		Concrete		
		Portland Cement	1.5	
		Dirt/Soil		
		Ash		
		Oil-dri	3.2	
		Vermiculite	4.5	
		Salts		
		Filters/Insulation -	Glass Filter Media	
	Asbestos (filter, insulation)			
	Filter Dust			
	Inorganic Sludge -	Magnesia (insulations)		
Sludge High Na2O (1st Stage)				
Sludge High CaO (2nd Stage)				
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Aqueous Solutions		
		Leaded Rubber		
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelex/lead		
		Sheetrock		
		Plastics -	Polyethylene	3.8
			Polyvinyl Chloride (PVC)	1.0
Teflon	0.0			
<u>Combustibles</u> (>90% Combustible)	Rubber -	Plexiglass		
		Rubber		
		Surgeons' Glove		
Misc. Combustibles -	Graphite (molds)			
	Paper	0.0		
	Wood			
	Cardboard			
	Cloth			

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
METAL (EQUIPMENT PIECES, TOOLS, ETC.)			4-1
OTHER (SMALL PIECES OF DESKS ETC.)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-132

METALS (a-LLW)

C. Code/Name: 803

METAL, EQUIPMENT, PIPES, VALVES, ETC.

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of LLW scrap from line and non-line generated metal wastes, cut-up glove boxes, process equipment, machinery, motors, pumps, tools, tanks, and scrap from cleanup projects.

Total Volume (m3): 2.76

Gross Mass (kg): 970.00

Drum Equivalents: 13.00

Physical Form: SOLID

Physical Type: METAL

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste comes from Mound Laboratory. It consists of stainless steel, carbon steel, and small amounts of aluminum-metal wastes in the form of valves, piping, wrenches, nuts, bolts, stainless steel tubing, spatulas, pans, hotplates, ringstands, etc. Limited amounts of combustible and noncombustible wastes are also present from content codes 810, 811, 812, 813, 814, 826, and 832. Content code 832 is liquid mercury. Content code 812 is spent ion-exchange resin.

Most of the waste is metal waste that is primarily from D&D operations. Some of the metals were leached with nitric acid, ultrasonically cleaned, and dried to remove above-discard amounts of plutonium.

Waste is packaged in 1-gallon, plastic coated cardboard cartons which are in turn placed in two layers of PE bags and then placed into a 55-gallon drum. Some large metal waste is taped on the rough edges and sealed in two layers of plastic and then placed into a 55-gallon drum. Drums have drum rigid liners and a drum bag. Each carton is individually assayed. Contaminated elemental mercury from content code 832 must be segregated.

The specific locations, by drum, of waste cartons from content code 832 are known. Therefore, the waste drums containing this content code will be easily identified.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-132-803

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
13	DRUM	2.76	970.00	METAL, EQUIPMENT, PIPES, VALVES, ETC.
Subtotal	13	2.76	970.00	

Total 13**2.76 m3****970.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

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D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D009	MERCURY	ELEMENTAL MERCURY CONTAMINATED WITH RADIOACTIVE MATERIALS	7439-97-6	3.000	10.000
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		260

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	12.5
		Stainless Steel	31.1
		Aluminum (AL)	
		Tantalum: 10W	
		Miscellaneous Metal	41.4
		Lead (Bulk Pb)	0.8
		Other HVPM (Zn, Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	1.5
		Dirt/Soil	
		Ash	
		Oil-dri	3.2
		Vermiculite	4.5
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	3.8
		Polyvinyl Chloride (PVC)	1.0
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	0.0
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
MERCURY			4-1
METAL (STAINLESS STEEL, CARBON STEEL, ALUMINUM)			4-1
RESINS (ION EXCHANGE RESIN)			4-1

A. IDENTIFICATIONINEL ID/Name: **ID-EGG-134**

MISCELLANEOUS(PAPER,METAL, ETC.) (a-LLW)

C. Code/Name: **100**

GENERAL PLANT WASTE

B. DESCRIPTION**INEL ID (WMIS) Description:**

General plant waste, alpha-gamma hot cell facility waste, laboratory waste from ANL-W and ICPP, and americium process residue.

Total Volume (m3): 371.00

Gross Mass (kg): 85,800.01

Drum Equivalents: 1,750.00

Physical Form: SOLID

Physical Type: PAPER, RAGS, RUBBER, METAL PLASTIC, GLASS

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☒ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at Argonne National Laboratory-East, contains combustible and noncombustible items such as paper, rags, rubber gloves, plastic bottles, glassware, small tools, balances, and empty metal cans. The waste is usually separated into combustible and noncombustible streams. Prior to 1981, small amounts of absorbed organic wastes are included.

Waste packaged after 1981 is WIPP certifiable. Waste packaged prior to 1982 may not be WIPP-certifiable due to the presence of potentially unstable materials. Since the waste is packaged in bins, all of the bins may require opening and handling to meet TRAMPAC limits, such as vented container requirements. There may be gas generation potential, since the organic content will exceed 6 lb/ft³ for combustible-containing bins. The levels of dispersible fines should be within WIPP-WAC limits. No free liquids should be present. There may be small amounts of sludges. The waste contains contaminated gas cylinders which are empty and have open valves. Aerosol cans may also be included. Prior to 1981, potentially unstable material such as nitrated organic resins, ether-based scintillation fluids were also included.

Wastes are packaged in 3- and 5-gallon cans and the 55-gallon drums are segregated into combustible and noncombustible streams and placed in M-III bins.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-134-100

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	106	BIN	371.00	85,800.01	GENERAL PLANT WASTE
Subtotal	106		371.00	85,800.01	

Total 106**371.00 m3****85,800.01 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D001	IGNITABLE	OXIDIZERS			20.000
F003	SPENT NON-HALOGENATED SOLVENTS	ETHYL ETHER	60-29-7		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	2.10E+05	1.40E+05
Totals		2.10E+05	1.40E+05

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	2.16E+02	1.05E-06	6.50E+01	8.69E-07	6.50E+01	1.54E-06	9.57E+01	1.28E-06	9.57E+01
PU-242	3.00E+01	2.54E-05	9.99E+01	2.36E-07	9.99E+01	3.44E-05	1.35E+02	3.19E-07	1.35E+02
TH-232	2.70E+01	1.06E-05	0.00E+00	2.95E-03	2.95E-03	1.40E-05	0.00E+00	3.89E-03	3.89E-03
U-233	1.00E-01	5.96E-08	0.00E+00	5.77E-01	5.77E-01	7.29E-08	0.00E+00	7.06E-01	7.06E-01
U-235	5.11E+01	5.87E-06	0.00E+00	1.13E-02	1.13E-02	8.59E-06	0.00E+00	1.65E-02	1.65E-02
U-238	1.26E+02	2.42E-05	0.00E+00	8.12E-03	8.12E-03	3.42E-05	0.00E+00	1.15E-02	1.15E-02

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
Non-Combustible (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	17.9
	Metals -	Carbon Steel	43.1
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	0.1
		Lead (Bulk Pb)	5.5
		Other HVPM(Zn,Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	
		Vermiculite	
		Salts	
		Filters/Insulation -	
		Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
Partial Combustible (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	26.5
	Plastics -	Polyethylene	0.3
		Polyvinyl Chloride (PVC)	0.1
		Teflon	0.0
Combustibles (>90% Combustible)	Rubber -	Plexiglass	
		Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	1.4
		Wood	5.0
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (UNKNOWN)			4-1
ETHER-BASED SCINTILLATION FLUIDS			4-1, 2
GLASS (GLASSWARE)			4-1, 2
METAL (SMALL TOOLS, BALANCES, METAL CANS)			4-1, 2
NITRATED ORGANIC RESINS			4-1, 2
ORGANICS	6	LB/FT3	4-1
OTHER (GAS CYLINDERS W/ OPEN VALVES, AROSOL CANS)			4-1
PAPER			4-1, 2
PLASTIC (BOTTLES)			4-1
RAGS			4-1
RUBBER (GLOVES)			4-1
SLUDGE			4-1

A. IDENTIFICATIONINEL ID/Name: **ID-EGG-134** MISCELLANEOUS(PAPER,METAL, ETC.) (a-LLW)C. Code/Name: **101** CUT UP GLOVEBOXES**B. DESCRIPTION****INEL ID (WMIS) Description:**

General plant waste, alpha-gamma hot cell facility waste, laboratory waste from ANL-W and ICPP, and americium process residue.

Total Volume (m3): 38.50

Gross Mass (kg): 10,440.00

Drum Equivalents: 181.60

Physical Form: SOLID

Physical Type: METAL, GLASS, PLASTIC, RUBBER

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☒ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at Argonne National Laboratory-East, contains glovebox sections and associated equipment from decontamination and decommissioning operations. The waste is predominantly noncombustible. There may be some lead (EP toxic, waste code D008) present.

This waste is WIPP certifiable. Gas generation potential should be acceptable, since the organic content is around 3 lb/ft³. The levels of dispersible fines should be within WIPP-WAC limits. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in this waste.

This waste is contained in M-III bins with half or full-sized plywood box liners. Miscellaneous items such as machines, tools, glassware, piping, filters, and cinderblock are contained in 20-mil PVC bags, heat sealed, and placed in the plywood liners. Gloveboxes are dismantled, wrapped in one or more layers of PE, and placed in the liners.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

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INEL Waste Profile Sheet

ALLMW

ID-EGG-134-101

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
11	BIN	38.50	10,440.00	CUT UP GLOVEBOXES
Subtotal 11		38.50	10,440.00	

Total 11**38.50 m3****10,440.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD	RADIOACTIVE LEAD SOLIDS	7439-92-1	50.000	100.000
D008	LEAD		64083-05-2	50.000	100.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Des' Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	2.10E+04	1.50E+04
Totals		2.10E+04	1.50E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	1.93E+01	9.23E-07	5.72E+01	7.65E-07	5.72E+01	1.31E-06	8.10E+01	1.08E-06	8.10E+01
U-235	9.30E+00	8.20E-06	0.00E+00	1.58E-02	1.58E-02	1.12E-05	0.00E+00	2.16E-02	2.16E-02

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)	
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings		
		Other Glass	10.0	
	Metals -	Carbon Steel	5.0	
		Stainless Steel	74.9	
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal	0.1	
		Lead (Bulk Pb)		
		Other HVPM(Zn,Cd)	0.0	
	Misc. Non-Combustible -	Ceramic (molds)		
		Firebrick		
		Concrete	2.0	
		Portland Cement		
		Dirt/Soil		
		Ash		
		Oil-dri		
		Vermiculite		
		Salts		
		Filters/Insulation -	Glass Filter Media	
			Asbestos (filter, insulation)	
	Filter Dust			
Magnesia (insulations)				
Inorganic Sludge -	Sludge High Na2O (1st Stage)			
	Sludge High CaO (2nd Stage)			
	Aqueous Solutions			
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber		
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelex/lead		
		Sheetrock		
		Plastics -	Polyethylene	1.6
			Polyvinyl Chloride (PVC)	0.4
			Teflon	0.0
Plexiglass				
Rubber -	Rubber			
	Surgeons' Glove			
Misc. Combustibles -	Graphite (molds)			
	Paper	1.0		
	Wood	5.0		
	Cardboard			
	Cloth			

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
CERAMIC (CINDERBLOCK)			4-1
FILTERS			4-1
GLASS (GLASSWARE)			4-1
METAL (MACHINES, TOOLS, PIPING, GLOVEBOX SECTIONS)			4-1, 2
ORGANICS	3	LB/FT3	4-1

A. IDENTIFICATIONINEL ID/Name: **ID-EGG-134**

MISCELLANEOUS(PAPER,METAL, ETC.) (a-LLW)

C. Code/Name: **121**

WIPP PRECERTIFIED DDW NONCOMBUSTIBLE SOLIDS

B. DESCRIPTION**INEL ID (WMIS) Description:**

General plant waste, alpha-gamma hot cell facility waste, laboratory waste from ANL-W and ICPP, and americium process residue.

Total Volume (m3): .21

Gross Mass (kg): 44.00

Drum Equivalents: 1.00

Physical Form: SOLID

Physical Type: OTHER

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste is generated at Argonne National Laboratory-East. The waste is derived from decontamination and disposal of facilities and ancillary systems. The composition of the waste is unknown. It is expected to contain cadmium and lead, and may contain F-listed wastes.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

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INEL Waste Profile Sheet

ALLMW

ID-EGG-134-121

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	DRUM	0.21	44.00	WIPP PRECERTIFIED DDW NONCOMBUSTIBLE SOLIDS
Subtotal	1	0.21	44.00	

Total 1**.21 m3****44.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D004	ARSENIC	.	7440-38-2		10.000
D005	BARIUM	.	7440-39-3		10.000
D006	CADMIUM	.	7440-43-9		100.000
D007	CHROMIUM	.	7440-47-32		10.000
D008	LEAD	.	7439-92-1		100.000
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		260
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		10.000
P015	BERYLLIUM DUST	.	7440-41-7		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	4.40E+01	1.40E+01
Totals		4.40E+01	1.40E+01

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	1.70E-03	3.86E-08	3.08E+00	1.62E-04	3.08E+00	1.25E-07	9.97E+00	5.24E-04	9.97E+00

F. Design Basis Bulk Waste Materials**WASTE MATRIX CONSTITUENTS**

When no data are available, please refer to Section 3.7 of this report.

PHYSICAL/CHEMICAL COMPOSITION

When no data are available, please refer to Section 3.7 of this report.

A. IDENTIFICATION

INEL ID/Name: ID-EGG-134

MISCELLANEOUS(PAPER,METAL, ETC.) (a-LLW)

C. Code/Name: 201

NONCOMBUSTIBLE SOLIDS

B. DESCRIPTION**INEL ID (WMIS) Description:**

General plant waste, alpha-gamma hot cell facility waste, laboratory waste from ANL-W and ICPP, and americium process residue.

Total Volume (m3): 80.50

Gross Mass (kg): 26,100.00

Drum Equivalents: 379.72

Physical Form: SOLID

Physical Type: METAL, FILTERS, GLASS, PLASTIC, CONTAMINATED EQUIPMENT

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at Battelle Columbus Laboratories, contains noncombustible items such as tools, crucibles, piping, valves, pieces of equipment, lead bricks, plexiglass, and filters. The lead is considered an EP Toxic substance (Waste Code D008)

This waste is WIPP certifiable. Gas generation potential should be acceptable, since the organic content is minimal. The levels of dispersible fines should be within WIPP-WAC limits. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in this waste.

Prior to packaging, each waste item is given a smear test and then triple contained in either nylon reinforced plastic sheeting or PE bags. The waste is placed in 55-gallon drums fitted with 90-mil liners, or else placed in M-III bins. Some drums which do not meet INEL packaging criteria are also overpacked in bins.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

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INEL Waste Profile Sheet

ALLMW

ID-EGG-134-201

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
23	BIN	80.50	26,100.00	NONCOMBUSTIBLE SOLIDS
Subtotal	23	80.50	26,100.00	

Total 23**80.50 m3****26,100.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2	50.000	100.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	2.70E+04	1.90E+04
Totals		2.70E+04	1.90E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	1.24E+01	4.63E-07	2.87E+01	3.83E-07	2.87E+01	6.38E-07	3.95E+01	5.28E-07	3.95E+01
U-235	1.30E+02	1.67E-05	0.00E+00	3.21E-02	3.21E-02	2.19E-05	0.00E+00	4.21E-02	4.21E-02

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	5.0
	Metals -	Carbon Steel	32.0
		Stainless Steel	32.0
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	1.0
		Lead (Bulk Pb)	10.0
		Other HVPM(Zn,Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	2.5
		Ash	
		Oil-dri	
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	6.5
		Asbestos (filter, insulation)	
		Filter Dust	1.0
	Inorganic Sludge -	Magnesia (insulations)	
		Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Aqueous Solutions	
		Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	4.0
		Polyvinyl Chloride (PVC)	1.0
		Teflon	0.0
		Plexiglass	5.0
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
METAL (LEAD BRICKS, TOOLS, PIPING, VALVES)			4-1, 2
OTHER (EQUIPMENT)			4-1, 2
PLASTIC (PLEXIGLASS)			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-134

MISCELLANEOUS(PAPER,METAL, ETC.) (a-LLW)

C. Code/Name: 241

AMERICIUM PROCESS RESIDUE

B. DESCRIPTION**INEL ID (WMIS) Description:**

General plant waste, alpha-gamma hot cell facility waste, laboratory waste from ANL-W and ICPP, and americium process residue.

Total Volume (m3): 24.17

Gross Mass (kg): 19,000.00

Drum Equivalents: 114.00

Physical Form: SOLID

Physical Type: METAL, GLASS, PAPER, PLASTIC, RUBBER,
CONTAMINATED EQUIPMENTPCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☒ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant, consists of piping, flanges, valves, tools, equipment, PVC piping, glassware (flasks, broken ion exchange columns, etc.), glass filters, PE bottles, leaded glovebox gloves, paper, and plastics. Wastes were shipped only in 1972 and 1973, from renovation of the americium recovery line. Some of the containers are lead-lined.

The waste is certifiable (for WIPP). Gas generation potential is dependent on the levels of organic material in the waste, which may vary from negligible to 100 percent organic. Dispersible fines should be within WIPP-WAC limits. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in this waste. Some dried residue of 7 N nitric acid, hydrochloric acid, and ammonium thiocyanate may be present.

Smaller waste items are single and double contained in PE or PVC bags. Most of the bagged waste was placed in 13 inch high by 15.5 inch diameter Fibre-Paks. Larger items are placed directly inside 55-gallon drums. Fibre-Paks are usually wrapped with lead tape. Two Fibre-Paks fit in each drum. Most drums were lead shielded with 1/16 to 1/8 inch thick lead sheeting. Each drum was assayed.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

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INEL Waste Profile Sheet

ALLMW

ID-EGG-134-241

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	114	DRUM	24.17	19,000.00	AMERICIUM PROCESS RESIDUE
Subtotal	114		24.17	19,000.00	

Total 114**24.17 m3****19,000.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D001	IGNITABLE	OXIDIZERS			10.000
D002	CORROSIVE	ACID			10.000
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2	2.000	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	200	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	50	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

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INEL Waste Profile Sheet

ALLMW

ID-EGG-134-241

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	13.4
		Lead (Bulk Pb)	48.5
		Other HVPM(Zn,Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	4.1
		Vermiculite	
		Salts	
		Glass Filter Media	
<u>Partial Combustible</u> (10%-90% Combustible)	Filters/Insulation -	Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	24.7
		Polyvinyl Chloride (PVC)	8.1
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	2.6
		Cardboard	2.6
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
GLASS (GLASSWARE)			4-1,2
METAL (PIPING, FLANGES, VALVES)			4-1,2
OTHER (EQUIPMENT)			4-1,2
OTHER (LEADED GLOVES)			4-1,2
PAPER			4-1,2
PLASTIC (PVC PIPING, PE BOTTLES)			4-1,2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-134

MISCELLANEOUS(PAPER,METAL, ETC.) (a-LLW)

C. Code/Name: 824

NONCOMBUSTIBLE EQUIPMENT BOXES

B. DESCRIPTION**INEL ID (WMIS) Description:**

General plant waste, alpha-gamma hot cell facility waste, laboratory waste from ANL-W and ICPP, and americium process residue.

Total Volume (m3): 836.88

Gross Mass (kg): 265,000.02

Drum Equivalents: 3,947.55

Physical Form: SOLID

Physical Type: CONTAMINATED EQUIPMENT, PLASTIC, ABSORBENT MATERIALS

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream, generated at Mound Laboratory, consists of large, noncombustible wastes such as tanks (stainless steel and tantalum), piping, ducting, conduit, electric motors, pumps, metallurgical presses, lathes, dissolvers, evaporators, furnaces, ladders, vacuum sweepers, 24 x 24 x 12 inch HEPA filters, fume hoods, gloveboxes, plexiglass glovebox windows, and floor tile. Limited amounts of combustible wastes (plastic tanks, fiberglass gloveboxes, plastic contamination control tents, etc.) are also included.

The waste is certifiable (for WIPP) except for boxes filled with HEPA filters and cartons of resins which may both contain excessive fines. Gas generation potential is dependent on the levels of organic material in the waste, which may vary from negligible to in excess of 6 lb/ft³. Combustibles may exceed 25 volume percent in some boxes. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in this waste. Some emptied cylinders with opened valves, and punctured aerosol cans, are included in the waste.

All of this waste is packaged in standard or oversized boxes. Each item is generally wiped with wet rags and single or double contained in plastic. Open ends or openings are sealed. Oils or other liquids are drained from any equipment prior to packaging. Florco absorbent is added to each box for residual liquids. Polyurethane foam is added if necessary to help stabilize large equipment.

Some boxes contain smaller plywood boxes, cartons, cans, or drums of waste items. All plywood boxes are coated with fiberglass-reinforced polyester (FRP). Oversized boxes are not lined with plastic or cardboard liners.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-134-824

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	264	BOX	836.88	265,000.02	NONCOMBUSTIBLE EQUIPMENT BOXES
Subtotal	264		836.88	265,000.02	

Total	264	836.88 m3	265,000.02 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D005	BARIUM	.	7440-39-3		10.000
D006	CADMIUM	.	7440-43-9		10.000
D007	CHROMIUM	.	7440-47-32		10.000
D008	LEAD	.	7439-82-1		10.000
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		260
D010	SELENIUM	.	7782-49-2		10.000
D011	SILVER	.	7440-22-4		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	2.10E+03	2.10E+03
Totals		2.10E+03	2.10E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-43 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	1.00E-01	4.79E-08	2.97E+00	3.97E-08	2.97E+00	4.79E-08	2.97E+00	3.97E-08	2.97E+00

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	17.9
	Metals -	Carbon Steel	43.1
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	0.1
		Lead (Bulk Pb)	5.5
		Other HVPM(Zn,Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	
		Vermiculite	
		Salts	
		Filters/Insulation -	Glass Filter Media
	Asbestos (filter, insulation)		
	Filter Dust		
Magnesia (insulations)			
Inorganic Sludge -	Sludge High Na2O (1st Stage)		
	Sludge High CaO (2nd Stage)		
	Aqueous Solutions		
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	26.5
	Plastics -	Polyethylene	0.3
		Polyvinyl Chloride (PVC)	0.1
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
Misc. Combustibles -	Graphite (molds)		
	Paper	1.4	
	Wood	2.5	
	Cardboard	2.5	
	Cloth		

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (FLORCO)			4-1
FILTERS (HEPA FILTERS)			4-1
METAL (SS & TANTALUM TANKS, PUMPS, PIPING, MOTORS)			4-1, 2
ORGANICS	6	LB/FT3	4-1
OTHER (POLYURETHANE FOAM, FLOOR TILE)			4-1
PLASTIC (TANKS, PLEXIGLASS, CONTAMINATION TENTS)			4-1
RESINS (UNKNOWN)			4-1

A. IDENTIFICATIONINEL ID/Name: **ID-EGG-134**

MISCELLANEOUS(PAPER,METAL, ETC.) (a-LLW)

C. Code/Name: **950**

LSA METAL, GLASS, ETC.

B. DESCRIPTION**INEL ID (WMIS) Description:**

General plant waste, alpha-gamma hot cell facility waste, laboratory waste from ANL-W and ICPP, and americium process residue.

Total Volume (m3): 1,064.98

Gross Mass (kg): 408,550.03

Drum Equivalents: 5,023.48

Physical Form: SOLID

Physical Type: METAL, PLASTIC, GLASS, PAPER, RAGS, ABSORBENT MATERIALS

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream, generated at Rocky Flats Plant, contains primarily nonline generated noncombustible wastes from maintenance and renovation. Items in this waste include electrical conduit, water and steam pipes, tools, control panels, electronic instrumentation, light bulbs, windows, office equipment (typewriters, chairs, desks, filing cabinets, etc.), lead shielding, and structural metal. Limited amounts of combustible wastes such as paper, rags, etc. are also included.

The waste is not presently WIPP certifiable due to lack of characterization information. Most of this waste is contaminated with less than 100 nci/g TRU. Gas generation potential is minimal, since the organic content is less than 14 lb/ft³ for drums and less than 6 lb/ft³ for boxes. Fines should not be present in excessive amounts. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in this waste.

This waste stream is packaged in drums and in boxes. Depending on size and contamination levels of individual items, the waste is single or double contained in plastics or placed directly into prepared waste drums or boxes. Drums and boxes were prepared according to standard pre and post-1972 procedures. Oil-Dri absorbent is added to many of the containers. Each drum is assayed. Boxes are surveyed for the calculation of fissile contents.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-134-950

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
104	DRUM	22.05	10,610.00	LSA METAL, GLASS, ETC.
329	BOX	1,042.93	397,940.03	LSA METAL, GLASS, ETC.
Subtotal	433	1,064.98	408,550.03	

Total	433	1,064.98 m3	408,550.03 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD		7439-92-1	2.000	10.000
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2	2.000	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	7.60E+04	6.10E+04
Totals		7.60E+04	6.10E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	1.18E+01	1.56E-07	1.24E+01	6.53E-04	1.24E+01	1.94E-07	1.55E+01	8.12E-04	1.55E+01
U-238	1.90E+04	4.45E-02	0.00E+00	1.49E+01	1.49E+01	5.65E-02	0.00E+00	1.90E+01	1.90E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)	
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings		
		Other Glass	17.9	
	Metals -	Carbon Steel	43.1	
		Stainless Steel		
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal	0.1	
		Lead (Bulk Pb)	5.5	
		Other HVPM (Zn,Cd)	0.0	
	Misc. Non-Combustible -	Ceramic (molds)		
		Firebrick		
		Concrete		
		Portland Cement		
		Dirt/Soil		
		Ash		
		Oil-dri		
		Vermiculite		
		Salts		
		Filters/Insulation -	Glass Filter Media	
			Asbestos (filter, insulation)	
			Filter Dust	
			Magnesia (insulations)	
		Inorganic Sludge -	Sludge High Na2O (1st Stage)	
	Sludge High CaO (2nd Stage)			
	Aqueous Solutions			
Leaded Rubber				
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelex/lead		
		Sheetrock	26.5	
		Plastics -	Polyethylene	0.3
			Polyvinyl Chloride (PVC)	0.1
			Teflon	0.0
			Plexiglass	
		Rubber -	Rubber	
			Surgeons' Glove	
		Misc. Combustibles -	Graphite (molds)	
			Paper	1.4
			Wood	5.0
			Cardboard	
Cloth				

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)			4-1
GLASS (LIGHT BULBS, WINDOWS)			4-1
LEAD			4-1
METAL (TOOLS, STRUCTURAL METAL)			4-1
ORGANICS	14	LB/FT3	4-1
OTHER(ELECTRICAL CONDUIT, WATER PIPES, OFFICE EQUIP)			4-1
PAPER			4-1
RAGS			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-137

NONMETAL MOLDS AND CRUCIBLES (a-LLW)

C. Code/Name: 300

GRAPHITE

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of graphite molds, graphite cores, Leco crucibles and caps, and graphite electrodes.

Total Volume (m3): 18.44

Gross Mass (kg): 9,600.00

Drum Equivalents: 87.00

Physical Form: SOLID

Physical Type: OTHER, PLASTIC, ABSORBENT MATERIALS

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant, consists of graphite molds used in casting plutonium metal. The waste may also include small amounts of surgical gloves. The graphite is in the form of broken mold pieces. Some of the graphite has been scarfed or wire-brushed to remove above-discard deposits of plutonium. Some 1,1,1-trichloroethane (TCA, F001) may also be present.

This waste is WIPP certifiable. The graphite molds are almost pure carbon and should be inert in storage. The waste is noncombustible, but if pulverized and well mixed it will burn. Fines are not packaged with the waste. Although breakage and fines may result after packaging, levels of fines should not exceed WIPP-WAC limits. The waste is packaged with no free liquids, sludges, explosives, compressed gases, pyrophoric or corrosive materials.

Graphite pieces may be packed directly into prepared 55-gallon drums or else first packed inside Fibre-Paks. The Fibre-Paks are 13 inches high by 15.5 inches in diameter. Sealed Fibre-Paks are sealed inside single (PVC) or double (PVC and PE) bags. Two Fibre-Paks are placed in each prepared 55-gallon drum. Drums were packed according to the usual pre-1972 and post 1972 procedures. Each drum was assayed. Since 1972, the drums were also processed according to inspection and sealing procedures, and, since 1982, vermiculite instead of Oil-Dri was placed on top of the outer sealed PE drum bag.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-137-300

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	87	DRUM	18.44	9,600.00	GRAPHITE
Subtotal	87		18.44	9,600.00	

Total 87**18.44 m3****9,600.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D022	CHLOROFORM	.	67-66-3		10.000
D028	1,2-DICHLOROETHANE	.	107-06-2		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	BENZENE	71-43-2		10.000
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	4.90E+02	3.80E+02
Totals		4.90E+02	3.80E+02

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclatures for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	4.98E-02	1.35E-07	1.08E+01	5.66E-04	1.08E+01	1.79E-07	1.43E+01	7.51E-04	1.43E+01
U-233	1.90E+01	1.52E-04	0.00E+00	1.47E+03	1.47E+03	1.85E-04	0.00E+00	1.79E+03	1.79E+03

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non-Combustible</u> (<10% Combustible)	<u>Glass</u> -	Glass Rasching Rings	
		Other Glass	
	<u>Metals</u> -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
		Misc. Non-Combustible -	
		Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dn	1.3
		Vermiculite	5.0
		Salts	
	<u>Filters/Insulation</u> -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	<u>Inorganic Sludge</u> -	Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
		Leaded Rubber	
<u>Partial Combustible</u> (10%-90% Combustible)	<u>Partially Combustible</u> -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	<u>Plastics</u> -	Polyethylene	1.9
		Polyvinyl Chloride (PVC)	0.5
		Teflon	0.0
		Plexiglass	
	<u>Rubber</u> -	Rubber	
		Surgeons' Glove	
	<u>Misc. Combustibles</u> -	Graphite (molds)	89.3
		Paper	2.1
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)			4-1
ABSORBENT (VERMICULITE)			4-1
OTHER (GRAPHITE MOLDS)			4-1
RUBBER (SURGICAL GLOVES)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-137

NONMETAL MOLDS AND CRUCIBLES (a-LLW)

C. Code/Name: 301

GRAPHITE CORES

B. DESCRIPTION**INEL ID (WMIS) Description:**

Waste consists of graphite molds, graphite cores, Leco crucibles and caps, and graphite electrodes.

Total Volume (m3): 1.27

Gross Mass (kg): 630.00

Drum Equivalents: 6.00

Physical Form: SOLID

Physical Type: OTHER, PLASTIC, ABSORBENT MATERIALS

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant, is similar to graphite molds, content code 300. A graphite core is part of the shaped graphite mold used to cast plutonium metal. Some graphite molds are also included in this content code. This content code has not been used since 1977. The graphite has been broken into pieces, and some of the graphite has been scarfed or wire brushed to remove any above-discard deposits of plutonium. Some 1,1,1-trichloroethane (TCA, F001) may also be present.

This waste is WIPP certifiable. The graphite cores are almost pure carbon and should be inert in storage. The waste is noncombustible, but if pulverized and well mixed it will burn. Fines are not packaged with the waste. Although breakage and fines may result after packaging, levels of fines, should not exceed WIPP-WAC limits. The waste is packaged with no free liquids, sludges, explosives, compressed gases, pyrophoric or corrosive materials.

Graphite core pieces may be packed directly into prepared 55-gallon drums or else first packed inside Fibre-Paks. The Fibre-Paks are 13 inches high by 15.5 inches in diameter. Sealed Fibre-Paks are sealed inside single (PVC) or double (PVC and PE) bags. Two Fibre-Paks are placed in each prepared 55-gallon drum. Drums were packed according to the usual pre-1972 and post 1972 procedures. Each drum was assayed. Since 1972, the drums were also processed according to inspection and sealing procedures. Oil-dri was placed on top of the outer sealed PE drum bag.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-137-301

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
6	DRUM	1.27	630.00	GRAPHITE CORES
Subtotal 6		1.27	630.00	

Total 6**1.27 m3****630.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	0.1
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	5.5
		Vermiculite	1.6
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	3.0
		Polyvinyl Chloride (PVC)	0.7
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	86.6
		Paper	2.4
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)			4-1
OTHER (GRAPHITE MOLDS)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-141

PARTICULATE WASTES (a-LLW)

C. Code/Name: 90

DIRT

B. DESCRIPTION**INEL ID (WMIS) Description:**

Dirt, soil, etc. from floor sweepings and cleanups, grit from grit blasting operations and recovery from incinerator processing.

Total Volume (m3): 28.62

Gross Mass (kg): 38,000.00

Drum Equivalents: 135.00

Physical Form: SOLID

Physical Type: SOIL, SLUDGE, RUBBER, RAGS

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant, contains dry dirt and soil generated from cleanup of spills, leaks, etc. It may also include evaporator pond sludge. A limited amount of the waste may be damp. A limited amount may contain combustibles such as coveralls and gloves. Dirt is packaged in standard RFP drums. Sometimes the dirt is bagged before being placed in the drum.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-141-90

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
135	DRUM	28.62	38,000.00	DIRT
Subtotal	135	28.62	38,000.00	

Total 135**28.62 m3****38,000.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
					10.000
D001	IGNITABLE	OXIDIZERS			
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	200	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	700	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	METHYLENE CHLORIDE	75-9-2	50	10.000
F002	SPENT HALOGENATED SOLVENTS	METHANOL	67-56-1	10	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3	10	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	10	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	NITROBENZENE	98-95-3		10.000
F004	SPENT NON-HALOGENATED SOLVENTS				

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
		Misc. Non-Combustible -	
		Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	99.0
		Ash	
		Oil-dri	
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
		Partially Combustible -	
<u>Partial Combustible</u> (10%-90% Combustible)		Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
		Plastics -	
<u>Combustibles</u> (>90% Combustible)		Polyethylene	0.8
		Polyvinyl Chloride (PVC)	0.2
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
CLOTHING (COVERALLS, GLOVES)			4-1
SLUDGE (EVAPORATOR POND SLUDGE)			4-1
SOIL (DRY DIRT)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-141

PARTICULATE WASTES (a-LLW)

C. Code/Name: 150

LABORATORY WASTE

B. DESCRIPTION**INEL ID (WMIS) Description:**

Dirt, soil, etc. from floor sweepings and cleanups, grit from grit blasting operations and recovery from incinerator processing.

Total Volume (m3): 3.60

Gross Mass (kg): 1,210.00

Drum Equivalents: 17.00

Physical Form: SOLID

Physical Type: ABSORBENT MATERIALS, RUBBER, GLASS, PLASTIC, OTHER

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☒ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☐ Contact-Handled ☒ Remote-Handled**Content Code Description:**

This waste stream, generated at Idaho National Engineering Laboratory, contains laboratory waste from ANL-W including fluxwire, fission counters, HEDL samples, analytical samples dissolved and absorbed on Oil-dri, glassware, vials, miscellaneous waste from gloveboxes, dissolved pellets absorbed on Oil-dri, enriched and normal U3O8 pellets, aluminum foil and capsules, TREAT waste capsules, chlorinated ion exchange resins, Pu sources, and irradiated GE caps. Lab waste from ICPP includes Kimwipes, trash, glassware, dissolved samples absorbed in Oil-dri, analytical samples, gloves, etc.

The waste is WIPP certifiable. The organic content is highly variable, but gas generation potential should be acceptable, since the organic content is usually less than 14 lb/t3. The levels of dispersible fines should be within WIPP-WAC limits. No sludges or free liquids should be present. Absorbents were added if moisture was detected in any wastes. No explosive or pyrophoric materials should be in this waste.

Depending on when the wastes were packaged, the individual waste items may be contained in plastic, metal, or glass containers. Some of the containers are 2R containers. The containers are placed inside 55-gallon drums lined with two plastic liners. Some of the containers are wrapped in plastic, and others are placed directly into the drums. Oil-dri absorbent is added if moisture is present.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

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INEL Waste Profile Sheet

ALLMW

ID-EGG-141-150

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
2	INSERT	0.42	210.00	LABORATORY WASTE
15	DRUM	3.18	1,000.00	LABORATORY WASTE
Subtotal	17	3.60	1,210.00	

Total	17	3.60 m3	1,210.00 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volume.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID			*1.000
D008	LEAD		7439-92-1	2.000	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	6.90E+04	6.90E+04
Totals		6.90E+04	6.90E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	1.90E+00	2.78E-08	1.72E+00	2.30E-08	1.72E+00	2.78E-08	1.72E+00	2.30E-08	1.72E+00
U-235	8.98E+02	1.30E-05	0.00E+00	2.50E-02	2.50E-02	1.30E-05	0.00E+00	2.51E-02	2.51E-02
U-238	2.59E+03	2.85E-03	0.00E+00	9.59E-01	9.59E-01	4.23E-03	0.00E+00	1.42E+00	1.42E+00

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)		
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings			
		Other Glass	17.3		
	Metals -	Carbon Steel	40.1		
		Stainless Steel	5.8		
		Aluminum (AL)			
		Tantalum 10W			
		Miscellaneous Metal	0.1		
		Lead (Bulk Pb)	5.1		
		Other HVPM(Zn,Cd)	0.0		
	Misc. Non-Combustible -	Ceramic (molds)			
		Firebrick			
		Concrete	0.2		
		Portland Cement			
		Dirt/Soil			
		Ash			
		Oil-dri	0.0		
		Vermiculite	0.0		
		Salts			
		Filters/Insulation -	Glass Filter Media		
			Asbestos (filter, insulation)		
Filter Dust					
Magnesia (insulations)					
Inorganic Sludge -	Sludge High Na2O (1st Stage)				
	Sludge High CaO (2nd Stage)				
	Aqueous Solutions	2.2			
	<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber		
Organic Sludge					
Uncemented Resin					
Cemented Resin					
Asphalt					
Benelex/lead					
Sheetrock			19.8		
Combustibles			Plastics -	Polyethylene	0.4
				Polyvinyl Chloride (PVC)	0.1
				Teflon	0.0
	Plexiglass	2.5			
	Rubber -	Rubber			
Surgeons' Glove					
Misc. Combustibles -	Graphite (molds)				
	Paper	1.4			
	Wood	2.5			
	Cardboard	2.5			
	Cloth				

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)			4-1
GLASS (GLASSWARE, VIALS)			4-1
ORGANICS	14	LB/FT3	4-1
OTHER (FISSION COUNTERS, FLUXWIRE, ION EXCHG RESIN)			4-1
OTHER (U308 PELLETS)			4-1
PAPER (KIMWIPES, TRASH)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-141

PARTICULATE WASTES (a-LLW)

C. Code/Name: 372

GRIT

B. DESCRIPTION**INEL ID (WMIS) Description:**

Dirt, soil, etc. from floor sweepings and cleanups, grit from grit blasting operations and recovery from incinerator processing.

Total Volume (m3): .85

Gross Mass (kg): 500.00

Drum Equivalents: 4.00

Physical Form: SOLID

Physical Type: SOIL, OTHER

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant, consists of grit such as aluminum oxide and iron fines and pellets used in grit-blasting operations, and spent silica gel desiccant.

The waste is not WIPP certifiable, due to the potential of excessive fines. The only organic material is the packaging, which averages about 5 lb/ft3, excluding the drum liner. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in this waste.

The material is contained in 55-gallon drums. Inside the drums, the grit may be contained in PVC or PE bags in Vollrath stainless steel cans, or in 1-gallon PE bottles inside PVC and PE bags. Silica gel is placed directly into the prepared drums. Drums were prepared and inspected according to pre and post-1972 procedures.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-141-372

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	4	DRUM	0.85	500.00	GRIT
Subtotal	4		0.85	500.00	

Total	4	.85 m3	500.00 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
P015	BERYLLIUM DUST		7440-41-7	1.000	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

HYCO

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	16.7
	Metals -	Carbon Steel	33.3
		Stainless Steel	8.3
		Aluminum (AL)	33.3
		Tantalum 10W	
		Miscellaneous Metal	
	Misc. Non-Combustible -	Lead (Bulk Pb)	
		Other HVPIM(Zn,Cd)	
		Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	1.4
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
	Inorganic Sludge -	Magnesia (insulations)	
		Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	5.6
		Polyvinyl Chloride (PVC)	1.4
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
METAL (GRIT: AL OXIDES & IRON FINES)			4-1
ORGANICS	5	LB/FT3	4-1
OTHER (SPENT SILICA GEL DESICCANT)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-141

PARTICULATE WASTES (a-LLW)

C. Code/Name: 374

BLACKTOP, CONCRETE, DIRT AND SAND

B. DESCRIPTION**INEL ID (WMIS) Description:**

Dirt, soil, etc. from floor sweepings and cleanups, grit from grit blasting operations and recovery from incinerator processing.

Total Volume (m3): 368.04

Gross Mass (kg): 263,000.02

Drum Equivalents: 1,736.02

Physical Form: SOLID

Physical Type: SOIL, ABSORBENT MATERIALS, OTHER

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste contains blacktop, concrete, reinforced concrete, cinderblocks, bricks, dirt and sand. Limited amounts of waste may be damp. A limited amount may contain combustibles such as coveralls and gloves. The waste is generated from cleanup of spills and leaks, process changes, maintenance, and D&D operations. Portland cement is added to containers that contain wet or damp waste. Waste is packaged in standard RFP fashion in drums and boxes. Sometimes the waste is bagged before being placed in the containers.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-141-374

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1108	DRUM	234.90	200,000.01	BLACKTOP, CONCRETE, DIRT AND SAND
42	BOX	133.14	63,000.00	BLACKTOP, CONCRETE, DIRT AND SAND
Subtotal	1150	368.04	263,000.02	

Total 1,150**368.04 m3****263,000.02 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		10,000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10,000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	700	10,000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10,000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10,000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	50	10,000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1	10	10,000
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3	10	10,000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	10	10,000
F004	SPENT NON-HALOGENATED SOLVENTS	NITROBENZENE	98-95-3		10,000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	7.40E+04	6.10E+04
Totals		7.40E+04	6.10E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
AM-241	4.00E-03	6.99E-11	2.34E-01	4.19E-11	2.34E-01	8.66E-11	2.90E-01	5.19E-11	2.90E-01
PU-52	1.21E+01	1.64E-07	1.31E+01	6.89E-04	1.31E+01	2.00E-07	1.59E+01	8.38E-04	1.59E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	1.0
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	30.0
		Portland Cement	
		Dirt/Soil	32.5
		Ash	
		Oil-dri	
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	32.5
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	2.4
		Polyvinyl Chloride (PVC)	0.6
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	1.0
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (PORTLAND CEMENT)			4-1
CERAMIC (FIREBRICK, CINDERBLOCK)			4-1
CLOTHING (COVERALLS AND GLOVES)			4-1
OTHER (CONCRETE, ASPHALT)			4-1
SOIL (DIRT, SAND)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-141 PARTICULATE WASTES (a-LLW)

C. Code/Name: 842 CONTAMINATED SOIL

B. DESCRIPTION**INEL ID (WMIS) Description:**

Dirt, soil, etc. from floor sweepings and cleanups, grit from grit blasting operations and recovery from incinerator processing.

Total Volume (m3): 85.59

Gross Mass (kg): 56,080.00

Drum Equivalents: 403.73

Physical Form: SOLID

Physical Type: SOIL

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste, generated at Mound Laboratories, consists of soil, including small rocks and pebbles, generated from cleanup of a leak. All soil waste was dry when packaged. A few waste boxes also include picks, shovels, metal cans, rubber gloves, booties, respirators, plastic, and possibly an air hammer and chisel. Soils waste was packaged in small, plastic lined plywood boxes (42 x 20 x 39 inch) other waste was then placed on top of the soil before the box was sealed. four of the small boxes were then packaged in a standard larger waste box (4 x 4 x 7 feet) lined with fiberglass-reinforced polyester. Assay was performed using radiochemical analysis on core samples taken from the contaminated area.

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INEL Waste Profile Sheet

ALLMW

ID-EGG-141-842

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	27	BOX	85.59	56,080.00	CONTAMINATED SOIL
Subtotal	27		85.59	56,080.00	

Total 27**85.59 m3****56,080.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D002	CORROSIVE	ACID			10.000
D003	REACTIVE	OTHER REACTIVES			10.000
D006	CADMIUM	.	7440-43-9		10.000
D007	CHROMIUM	.	7440-47-32		10.000
D008	LEAD	.	7439-92-1		10.000
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		260
D010	SELENIUM	.	7782-49-2		10.000
D011	SILVER	.	7440-22-4		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

11100

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

BY CO

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	0.3
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	96.0
		Ash	
		Oil-dri	
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	0.8
		Polyvinyl Chloride (PVC)	0.2
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	2.7
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
METAL (PICKS, SHOVELS, CANS, AIR HAMMER, CHISEL)			4-1
RUBBER (GLOVES)			4-1
SOIL (SMALL ROCKS, PEBBLES)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-141

PARTICULATE WASTES (a-LLW)

C. Code/Name: 990

DIRT

B. DESCRIPTION**INEL ID (WMIS) Description:**

Dirt, soil, etc. from floor sweepings and cleanups, grit from grit blasting operations and recovery from incinerator processing.

Total Volume (m3): 99.64

Gross Mass (kg): 120,000.01

Drum Equivalents: 470.00

Physical Form: SOLID

Physical Type: SOIL, SLUDGE, RUBBER, RAGS

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant, contains dry dirt and soil generated from cleanup of spills, leaks, etc. It may also include evaporator pond sludge. A limited amount of the waste may be damp. A limited amount may contain combustibles such as coveralls and gloves. Dirt is packaged in standard RFP drums. Sometimes the dirt is bagged before being placed in the drum.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-141-990

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	470	DRUM	99.64	120,000.01	DIRT
Subtotal	470		99.64	120,000.01	

Total 470**99.64 m3****120,000.01 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D001	IGNITABLE	OXIDIZERS			10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	200	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	100	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	700	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	50	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1	10	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3	10	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	10	10.000
F004	SPENT NON-HALOGENATED SOLVENTS	NITROBENZENE	98-95-3		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

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INEL Waste Profile Sheet

ALLMW

ID-EGG-141-990

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
Non- Combustible (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	99.0
		Ash	
		Oil-dri	
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
	Partially Combustible -	Leaded Rubber	
Partial Combustible (10%-90% Combustible)		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
Combustibles (>90% Combustible)	Plastics -	Polyethylene	0.8
		Polyvinyl Chloride (PVC)	0.2
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
CLOTHING (COVERALLS AND GLOVES)			4-1
SLUDGE (EVAPORATOR POND SLUDGE)			4-1
SOIL (DRY DIRT AND SOIL)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-144

RADIOACTIVE SOURCES (a-LLW)

C. Code/Name: 104

ALPHA HOT CELL WASTE

B. DESCRIPTION

INEL ID (WMIS) Description:

Sample fuel and hot-cell waste

Total Volume (m3): 47.81

Gross Mass (kg): 11,000.00

Drum Equivalents: 225.51

Physical Form: SOLID

Physical Type: METAL, PAPER, PLASTIC, RUBBER, CONTAMINATED
EQUIPMENT, GLASSPCBs: ☐

Combustibility:

- ☐
- Combustible (>90%)
-
- ☒
- Partially Combustible (10%-90%)
-
- ☐
- Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☐ Contact-Handled ☒ Remote-Handled**Content Code Description:**

This waste stream, generated at Argonne National Laboratory-East, contains alpha hot cell waste. Noncombustible and combustible waste are segregated. Combustible wastes include: paper, plastic and PVC containers, rubber O-rings and gloves, rags, and O-tips. Noncombustible wastes include: lab equipment, tools, fixtures, glassware, pipe, tubing, fitting, fasteners, firebrick, ferrous and nonferrous metal scraps and parts, and small electric motors. Sodium in the waste is reacted with ethyl alcohol, mixed with pelletized clay, and dried. Nitrates and oxidizing agents are neutralized or reduced, mixed with pelletized clay, and dried to ferrous or ferric salts.

This waste is WIPP certifiable. The average organic content is 5 lb/ft³. Gas generation potential is unknown, but no problems have been identified. The combustible content of some containers exceeds 25 volume percent, including packaging. Fines are within WIPP-WAC limits. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in this waste. Surface contamination and nuclear criticality meet WIPP-WAC limits. Thermal power does not exceed 10 watts per package. Surface dose rates average 5.3 R/hr, and are limited to 30 R/hr.

The waste is packaged in 17C 30-gallon drums. Individual waste items may be loose, contained in 4 inch diameter by 10 inch high portal cans, or contained in 1-gallon paint cans. Some metal or glass wastes are compacted. Some items may be contained in 7.5-gallon steel buckets, and then packaged, two buckets per package, in heat-sealed PVC bags. Since 1983, the heat-sealed bags are lined with kraft paper. These buckets of PVC-bagged waste contained in a 30-gallon drum liner and sealed inside another 20-mil PVC bag in a 30-gallon steel drum. The maximum weight for each drum is 200 lbs, and the maximum dose rate is 30 R/hr.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

AIM

Association for Information and Image Management

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Silver Spring, Maryland 20910

301/587-8202

Centimeter

Inches

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INEL Waste Profile Sheet

ALLMW

ID-EGG-144-104

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	209	DRUM	44.31	9,900.00	ALPHA HOT CELL WASTE
	1	BIN	3.50	1,100.00	ALPHA HOT CELL WASTE
Subtotal	210		47.81	11,000.00	

Total 210**47.81 m3****11,000.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD		7439-92-1		100.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	8.40E+03	5.10E+03
Totals		8.40E+03	5.10E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	2.84E-01	3.37E-08	2.09E+00	2.79E-08	2.09E+00	5.52E-08	3.42E+00	4.57E-08	3.42E+00
PU-240	9.35E-03	1.21E-07	2.75E+01	1.25E-05	2.75E+01	1.61E-07	3.66E+01	1.66E-05	3.66E+01
U-235	1.85E+02	2.22E-05	0.00E+00	4.27E-02	4.27E-02	3.64E-05	0.00E+00	7.00E-02	7.00E-02

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	1.0
	Metals -	Carbon Steel	
		Stainless Steel	40.0
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
	Misc. Non-Combustible -	Lead (Bulk Pb)	1.0
		Other HVPM(Zn,Cd)	
		Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/ Soil	
		Ash	
		Oil-dri	
		Vermiculite	28.0
		Salts	10.0
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
	Inorganic Sludge -	Magnesia (insulations)	
		Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
		Leaded Rubber	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	6.4
		Polyvinyl Chloride (PVC)	1.6
		Teflon	0.0
		Plexiglass	
<u>Combustibles</u> (>90% Combustible)	Rubber -	Rubber	
		Surgeons' Glove	2.0
	Misc. Combustibles -	Graphite (molds)	
		Paper	5.0
		Wood	
		Cardboard	
		Cloth	5.0

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
CERAMIC (FIREBRICK, PELLETIZED CLAY)			4-1
FERROUS OR FERRIC SALTS			4-1
GLASS (GLASSWARE)			4-1, 2
METAL (LAB EQUIPMENT, TOOLS, PIPE, TUBING, SCRAPS)			4-1, 2
ORGANICS	5	LB/FT3	4-1
OTHER (Q-TIPS, FASTENERS, FITTINGS, FIXTURES)			4-1
PAPER			4-1, 2
PLASTIC (PVC AND OTHER PLASTIC CONTAINERS)			4-1
RAGS			4-1
RUBBER (O-RINGS, GLOVES)			4-1
SODIUM ETHOXIDE			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-144

RADIOACTIVE SOURCES (a-LLW)

C. Code/Name: 153

COMBUSTIBLE LAB WASTE

B. DESCRIPTION**INEL ID (WMIS) Description:**

Sample fuel and hot-cell waste.

Total Volume (m3): 5.94

Gross Mass (kg): 1,493.00

Drum Equivalents: 28.00

Physical Form: SOLID

Physical Type: PAPER, PLASTIC, RUBBER

PCBs: ☐**Combustibility:**☒ Combustible (>90%)☐ Partially Combustible (10%-90%)☐ Noncombustible (<10%)**Waste Type**☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW**Rad. Level**☐ Contact-Handled☒ Remote-Handled**Content Code Description:**

This waste stream was generated at the Argonne National Laboratory-West at the INEL. Most of the waste is organic and combustible materials including paper, wood, PVC and plastic containers and items, rubber gaskets and gloves, leather, rags, towels, Q-tips, tubing, filter media, abrasive media and metal pieces. Small residuals of moderators and fuel are trapped on the filters. This drum is one of the 28 total drums of content code 153 waste. This drum is stored at the Transuranic Storage Area (TSA) for contact-handled waste. The other 27 drums are stored at the Intermediate Level Transuranic Storage Facility (ILTSF) for remote handled waste.

This waste is WIPP certifiable. The organic content may exceed 14 lb/ft3. The gas generation potential is not known. Combustibles, including packaging, may exceed 25 volume percent. The levels of dispersible fines should be within WIPP-WAC limits. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in this waste.

Individual waste items may be loose or plastic bagged. Combustibles and noncombustibles are segregated to separate waste cans. Each can is weighed and assayed. The inner waste cans are loaded into an outer waste drum, along with a lead shield plug. Assays are done for each can and for the drums.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-144-153

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	28	DRUM	5.94	1,493.00	COMBUSTIBLE LAB WASTE
Subtotal	28		5.94	1,493.00	

Total 28**5.94 m3****1,493.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.20E+03	8.00E+02
Totals		1.20E+03	8.00E+02

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	4.00E-01	9.46E-07	5.86E+01	7.84E-07	5.86E+01	9.46E-07	5.86E+01	7.84E-07	5.86E+01
U-235	2.24E+02	1.90E-04	0.00E+00	3.65E-01	3.65E-01	2.81E-04	0.00E+00	5.40E-01	5.40E-01
U-238	1.50E+02	7.14E-04	0.00E+00	2.40E-01	2.40E-01	7.14E-04	0.00E+00	2.40E-01	2.40E-01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)	
<u>Non- Combustible</u> ($<10\%$ Combustible)	Glass -	Glass Rasching Rings		
		Other Glass	5.0	
	Metals -	Carbon Steel		
		Stainless Steel	5.0	
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal		
		Lead (Bulk Pb)	20.0	
		Other HVPM(Zn,Cd)		
	Misc. Non-Combustible -	Ceramic (molds)		
		Firebrick		
		Concrete		
		Portland Cement		
		Dirt/Soil		
		Ash		
		Oil-dri	20.0	
		Vermiculite		
		Salts		
		Filters/Insulation -	Glass Filter Media	
			Asbestos (filter, insulation)	
Filter Dust				
Inorganic Sludge -	Magnesia (insulations)			
	Sludge High Na ₂ O (1st Stage)			
	Sludge High CaO (2nd Stage)			
<u>Partial Combustible</u> (10% - 90% Combustible)	Partially Combustible -	Aqueous Solutions		
		Leaded Rubber		
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelex/lead		
		Sheetrock		
		Plastics -	Polyethylene	18.0
			Polyvinyl Chloride (PVC)	4.0
Teflon	0.0			
Plexiglass				
Rubber -	Rubber	5.0		
	Surgeons' Glove	5.0		
	Misc. Combustibles -	Graphite (molds)		
Paper		10.0		
Wood				
Cardboard				
Cloth		10.0		

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
FILTERS (FILTER MEDIA)			4-1, 2
METAL (METAL PIECES)			4-1, 2
ORGANICS	14	LB/FT3	4-1
OTHER (LEATHER, Q-TIPS)			4-1, 2
PAPER			4-1, 2
PLASTIC (PVC)			4-1, 2
RUBBER (GASKETS, GLOVES)			4-1, 2
WOOD			4-1, 2

A. IDENTIFICATIONINEL ID/Name: **ID-EGG-144** RADIOACTIVE SOURCES (a-LLW)C. Code/Name: **154** SAMPLE FUEL**B. DESCRIPTION****INEL ID (WMIS) Description:**

Sample fuel Pu & Am sources and hot-cell waste.

Total Volume (m3): .21

Gross Mass (kg): 210.00

Drum Equivalents: 1.00

Physical Form: SOLID

Physical Type: OTHER

PCBs: ☐

Combustibility:

- ☐
- Combustible (>90%)
-
- ☒
- Partially Combustible (10%-90%)
-
- ☐
- Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☐ Contact-Handled ☒ Remote-Handled**Content Code Description:**

This waste stream was generated at the INEL. These wastes include actinide neutron sources, a radium needle, small vials of fuel, and metal containers of experimental fuel capsules.

This waste is WIPP certifiable. Gas generation potential should be acceptable, since the organic content is less than 14 lb/ft³. Combustibles, including packaging, may exceed 25 volume percent. The levels of dispersible fines should be within WIPP-WAC limits. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in this waste.

These wastes are packaged three different ways, depending on when the packaging was done. Pu-Be sources packaged in 1975 were placed in a carbon steel pipe, which was cemented and encapsulated into the center of a 55-gallon drum. In 1978, Pu-Be sources were packaged in four 55-gallon drums. Wastes packed in 1980 were wrapped plastic, placed in paraffin lined 15-gallon drums, and then placed in 55-gallon drums.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

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INEL Waste Profile Sheet

ALLMW

ID-EGG-144-154

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	DRUM	0.21	210.00	SAMPLE FUEL
Subtotal	1	0.21	210.00	

Total 1**.21 m3****210.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUTE

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

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INEL Waste Profile Sheet

ALLMW

ID-EGG-144-154

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

When no data are available, please refer to Section 3.7 of this report.

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ORGANICS	14	LB/FT3	4-1
OTHER (ACTINIDE NEUTRON SOURCES, RADIUM NEEDLE)			4-1, 2
OTHER (FUEL)			4-1, 2

A. IDENTIFICATIONINEL ID/Name: **ID-EGG-145**

RESINS (a-LLW)

C. Code/Name: **430**

UNLEACHED ION COLUMN RESIN

B. DESCRIPTION**INEL ID (WMIS) Description:**

Leached and unleached ion column exchange resins used in the purification and recovery of plutonium and americium.

Total Volume (m3): 1.91

Gross Mass (kg): 1,610.00

Drum Equivalents: 9.00

Physical Form: SOLID

Physical Type: OTHER.

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☒ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste, generated at the Rocky Flats Plant, consists of anionic and cationic exchange resins used in the purification and recovery of plutonium and americium, respectively. The anionic resins were DOWEX 1-X4 and the cationic resins were DOWEX 50W-X8, both being polystyrene-divinylbenzene copolymers.

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INEL Waste Profile Sheet

ALLMW

ID-EGG-145-430

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
9	DRUM	1.91	1,610.00	UNLEACHED ION COLUMN RESIN
Subtotal	9	1.91	1,610.00	

Total 9**1.91 m3****1,610.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D001	IGNITABLE	OXIDIZERS			200,000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings Other Glass	
	Metals -	Carbon Steel Stainless Steel Aluminum (AL) Tantalum 10W Miscellaneous Metal Lead (Bulk Pb) Other HVPM(Zn,Cd)	0.1
	Misc. Non-Combustible -	Ceramic (molds) Firebrick Concrete Portland Cement Dirt/Soil Ash Oil-dri Vermiculite Salts	0.3 0.1 5.2 0.3
	Filters/Insulation -	Glass Filter Media Asbestos (filter, insulation) Filter Dust Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage) Sludge High CaO (2nd Stage) Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber Organic Sludge Uncemented Resin Cemented Resin Asphalt Benzene/lead Sheetrock	82.1
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene Polyvinyl Chloride (PVC) Teflon Plexiglass	9.5 2.4 0.0
	Rubber -	Rubber Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds) Paper Wood Cardboard Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
RESINS (ANIONIC AND CATIONIC EXCHANGE RESINS)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-145

RESINS (a-LLW)

C. Code/Name: 431

LEACHED RESIN

B. DESCRIPTION**INEL ID (WMIS) Description:**

Leached and unleached ion column exchange resins used in the purification and recovery of plutonium and americium.

Total Volume (m3): .42

Gross Mass (kg): 366.00

Drum Equivalents: 2.00

Physical Form: SOLID

Physical Type: OTHER.

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☒ Partially Combustible (10%-90%)☐ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste, generated at the Rocky Flats Plant, consists of anionic and cationic exchange resins used in the purification and recovery of plutonium and americium, respectively. It is believed that the resins were content code 430 resins that were processed by leaching to recover plutonium. Content code was used during 1972 only.

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INEL Waste Profile Sheet

ALLMW

ID-EGG-145-431

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
2	DRUM	0.42	366.00	LEACHED RESIN
Subtotal	2	0.42	366.00	

Total	2	.42 m3	366.00 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D001	IGNITABLE	OXIDIZERS			200.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	0.1
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	0.3
		Dirt/Soil	0.1
		Ash	
		Oil-dri	5.2
		Vermiculite	0.3
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	82.1
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	9.5
		Polyvinyl Chloride (PVC)	2.4
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
RESINS (LEACHED ANIONIC & CATIONIC EXCHANGE RESIN)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-145

RESINS (a-LLW)

C. Code/Name: 432

LEACHED AND CEMENTED RESIN

B. DESCRIPTION**INEL ID (WMIS) Description:**

Leached and unleached ion column exchange resins used in the purification and recovery of plutonium and americium.

Total Volume (m3): 8.90

Gross Mass (kg): 5,700.00

Drum Equivalents: 42.00

Physical Form: SOLID

Physical Type: OTHER.

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste, generated at the Rocky Flats Plant, consists of anion and cation exchange resins used in the purification and recovery of plutonium and americium, respectively. The resins are leached and cemented before disposal.

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INEL Waste Profile Sheet

ALLMW

ID-EGG-145-432

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	42	DRUM	8.90	5,700.00	LEACHED AND CEMENTED RESIN
Subtotal	42		8.90	5,700.00	

Total 42**8.90 m3****5,700.00 kg**

1. Values in this table represent actual quantities in storage.
2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD		7439-92-1		10.000
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	9.50E+01	7.20E+01
Totals		9.50E+01	7.20E+01

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	1.30E-02	1.37E-07	1.09E+01	5.74E-04	1.09E+01	1.80E-07	1.43E+01	7.54E-04	1.43E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings Other Glass	
	Metals -	Carbon Steel Stainless Steel Aluminum (AL) Tantalum 10W Miscellaneous Metal Lead (Bulk Pb) Other HVPM(Zn,Cd)	0.1
	Misc. Non-Combustible -	Ceramic (molds) Firebrick Concrete Portland Cement Dirt/Soil Ash Oil-dri Vermiculite Salts	0.3 0.1 5.2 0.3
	Filters/Insulation -	Glass Filter Media Asbestos (filter, insulation) Filter Dust Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (1st Stage) Sludge High CaO (2nd Stage) Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber Organic Sludge Uncemented Resin Cemented Resin Asphalt Benzolex/lead Sheetrock	82.1
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene Polyvinyl Chloride (PVC) Teflon Plexiglass	9.5 2.4 0.0
	Rubber -	Rubber Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds) Paper Wood Cardboard Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
OTHER (LEACHED & CEMENTED ANION,CATION EXCHG RESIN			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-146

SALTS (a-LLW)

C. Code/Name: 5

EVAPORATOR SALTS

B. DESCRIPTION

INEL ID (WMIS) Description:

Evaporator salts and pyrochemical salts.

Total Volume (m3): 13.56

Gross Mass (kg): 10,850.00

Drum Equivalents: 63.95

Physical Form: SOLID

Physical Type: OTHER, RUBBER, PAPER, RAGS, METAL

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste, generated at the Rocky Flats Plant, consists of a salt residue generated by concentrating and drying liquid waste from the solar evaporation ponds. The approximate chemical makeup of the salt is 60% NaNO₃, 30% KNO₃, and 10% miscellaneous. Small amounts of other wastes such as surgeons' gloves, paper, rags, and metal may be found in the waste drums.

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INEL Waste Profile Sheet

ALLMW

ID-EGG-146-5

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
49	DRUM	10.39	9,010.00	EVAPORATOR SALTS
1	BOX	3.17	1,840.00	EVAPORATOR SALTS
Subtotal 50		13.56	10,850.00	

Total 50**13.56 m3****10,850.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volume.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D001	IGNITABLE	OXIDIZERS		900.000	900.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.60E+03	1.40E+03
Totals		1.60E+03	1.40E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	5.00E-01	3.12E-07	2.49E+01	1.31E-03	2.49E+01	3.64E-07	2.90E+01	1.53E-03	2.90E+01

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INEL Waste Profile Sheet

ALLMW

ID-EGG-146-5

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	5.0
		Dirt/Soil	
		Ash	
		Oil-dri	
		Vermiculite	
		Salts	90.0
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
	Partially Combustible -	Leaded Rubber	
<u>Partial Combustible</u> (10%-90% Combustible)		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	4.0
		Polyvinyl Chloride (PVC)	1.0
<u>Combustibles</u> (>90% Combustible)		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
KNO ₃	30	% WT	4-1
METAL			4-1
MISCELLANEOUS	10	% WT	4-1
NaNO ₃	60	% WT	4-1
PAPER			4-1
RAGS			4-1
RUBBER (SURGEONS GLOVES)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-158

UNCEMENTED ORGANIC SLUDGE (a-LLW)

C. Code/Name: 3

ORGANIC SETUPS, OIL SOLIDS

B. DESCRIPTION**INEL ID (WMIS) Description:**

Miscellaneous organic setups

Total Volume (m3): 1,001.85

Gross Mass (kg): 1,009,100.07

Drum Equivalents: 4,725.72

Physical Form: SOLID

Physical Type: SLUDGE, ABSORBENT MATERIALS

PCBs: ☒

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream contains liquid organic wastes generated by various plutonium and nonplutonium operations at the Rocky Flats Plant. These liquid wastes were mixed with calcium silicate to form a grease or paste-like material. Small amounts of Oil-dri absorbent were usually mixed with the waste.

About 47% of the organic waste stream is lathe coolant, which is 60% Texaco Regal oil and 40% carbon tetrachloride. About 10% of the organic waste stream is trichloroethane. The remaining 43% includes all of the other organic wastes.

The setup waste was prepared by blending approximately 30 gallons of organic wastes with 100 lb of calcium silicate (John Manville Microcel E) to form a solid-like paste or grease. Usually 10-20 lb of Oil-dri were mixed with the paste. The paste was placed into drums using the following procedures:

1970 - 1972: 1) place inside double plastic bags with Oil-dri in each bag, 2) place inside steel drum with more Oil-dri.

1972-present: 1) place inside O-ring bag and a second plastic bag, with Oil-dri in each bag, 2) place inside 90-mil PE drum liner, inside steel drum, with more Oil-dry in each container.

Average assays for the waste drums were usually obtained from radiochemical analysis of the batch mixtures and/or assays of individual bottles or drums received for setup processing. Since 1972, the setup drums were inspected for free liquids, proper packaging, and proper content code labeling. Rejected drums were returned for correction. Oil-dri (pre-1982) or vermiculite (post 1982) was added to the top to the sealed drum bag and liner.

The organic content probably exceeds 14 lb/ft³. Gas generation potential is not known, but no problems have yet been identified. Analysis of a retrieved content code 3 drum showed some separation of liquid waste from the calcium silicate, and damage to the inner plastic bag. In addition, bottles of organic wastes may be included periodically.

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
4636	DRUM	962.83	1,000,000.07	ORGANIC SETUPS, OIL SOLIDS
6	BOX	19.02	9,100.00	ORGANIC SETUPS, OIL SOLIDS
Subtotal		4642	1,001.85	1,009,100.07

Total	4,642	1,001.85 m3	1,009,100.07 kg
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1. Values in this table represent actual quantities in storage.
2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volume.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D005	BARIUM		7440-39-3		10.000
D011	SILVER		7440-22-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	150.000	300.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	50.000	100.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	50.000	100.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		10.000
F004	SPENT NON-HALOGENATED SOLVENTS	NITROBENZENE	98-95-3		10.000
P015	BERYLLIUM DUST		7440-41-7	1.000	10.000
TSCA	PCBs		1336-36-3	150.000	300.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	3.10E+05	2.70E+05
Totals		3.10E+05	2.70E+05

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	1.84E+02	6.04E-07	4.82E+01	2.53E-03	4.82E+01	6.72E-07	5.36E+01	2.82E-03	5.36E+01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
Non-Combustible (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	1.0
		Vermiculite	0.3
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
	Inorganic Sludge -	Magnesia (insulations)	
		Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
Partial Combustible (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	97.8
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	0.9
		Polyvinyl Chloride (PVC)	0.2
		Teflon	0.0
		Plexiglass	
Combustibles (>90% Combustible)	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
1,1,1-TRICHLOROETHANE (TCA)	10	% VOL	4-1, 2
ABSORBENT (OIL-DR)			4-1
CALCIUM SILICATE			4-1
ORGANICS	43	% VOL	4-1
OTHER (LATHE COOLANT)	47	% VOL	4-1
POLYCHLORINATED-BIPHENYLS (PCB's)			4-2

A. IDENTIFICATIONINEL ID/Name: **ID-EGG-163** TAN DECON HEAVY METAL SOLIDS AND DEBRIS

C. Code/Name: *

B. DESCRIPTION**INEL ID (WMIS) Description:**

This waste stream is dry solids (appears as sand) water rinsed from contaminated materials. The waste is from decontamination and decommissioning of a decontamination facility. High alpha content.

Total Volume (m3): .32

Gross Mass (kg): 263.08

Drum Equivalents: 1.52

Physical Form: SOLID

Physical Type: SLUDGE

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled

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INEL Waste Profile Sheet

ALLMW

ID-EGG-163-*

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
3	DM	0.32	263.08	TAN DECON SHOP DRY POWDERED SLUDGE
Subtotal	3	0.32	263.08	

Total 3**.32 m3****263.08 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D005	BARIUM	.	7440-39-3	266	10.000
D006	CADMIUM	.	7440-43-9	84	10.000
D007	CHROMIUM	.	7440-47-32	864	10.000
D008	LEAD	.	7439-92-1	1,580	10.000
D009	MERCURY	LOW MERCURY <280 MG/KG TOTAL MERCURY	7439-97-6	240	280
D011	SILVER	.	7440-22-4	74	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

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INEL Waste Profile Sheet

ALLMW

ID-EGG-163-*

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

When no data are available, please refer to Section 3.7 of this report.

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
BARIUM	266	PPM	4-6
CADMIUM	84	PPM	4-6
CHROMIUM	864	PPM	4-6
LEAD	1580	PPM	4-6
MERCURY	240	PPM	4-6
SILVER	74	PPM	4-6
SLUDGE	99	% WT	4-6

A. IDENTIFICATION

INEL ID/Name: ID-EGG-287

UNCATEGORIZED (a-LLW)

C. Code/Name: 0

NOT RECORDED - UNKNOWN

B. DESCRIPTION**INEL ID (WMIS) Description:**

This waste stream was received prior to 1973. As container specific information was not entered into the database prior to 1973, these wastes are uncategorized. It is expected to be similar to other Rocky Flats wastes received since 1973.

Total Volume (m3): 136.74

Gross Mass (kg): 60,000.00

Drum Equivalents: 645.00

Physical Form: SOLID

Physical Type: UNKNOWN

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☒ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the INEL, contains waste retrieved from shallow land burial during the INEL Early Waste Retrieval (EWR) and the Initial Drum Retrieval (IDR) projects. Most of these wastes are believed to have been initially generated at the Rocky Flats Plant. No content information is available. This stream is believed to consist of various types of waste generated by plutonium and nonplutonium operations. Any presence of hazardous wastes is unknown at this time. This waste is not WIPP certifiable due to lack of waste form information.

Following retrieval, buried wastes were repackaged in either plastic bags, tri-wall cardboard containers, 55-gallon drums or 83-gallon drums before placement in M-III bins. Some of the loose waste and operations generated waste was compacted in drums. Drummed wastes which were retrieved were overpacked in 83-gallon drums or placed in cargo containers if the drum integrity is good. Breached or internally contaminated drums were wrapped in plastic and placed in M-III bins. A few (11) drums from Rocky Flats Plant which were included in this waste stream were not part of the retrieval program. The content of these drums is unknown.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

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INEL Waste Profile Sheet

ALLMW

ID-EGG-287-0

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
645	DRUM	136.74	60,000.00	NOT RECORDED - UNKNOWN
Subtotal 645		136.74	60,000.00	

Total 645**136.74 m3****60,000.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

HAZARDOUS CONSTITUENTS					
EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS					
D002	CORROSIVE				10.000
D006	CADMIUM		7440-43-9	10	10.000
D008	LEAD		7439-92-1	50.000	100.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	5.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	50.000	100.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	2.000	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	1.000	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1	25	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3	10	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	50	10.000
P015	BERYLLIUM DUST		7440-41-7	1.000	10.000
TSCA	PCBs		1336-36-3	20.000	50.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	3.20E+04	2.40E+04
Totals		3.20E+04	2.40E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	3.20E+00	7.77E-07	4.82E+01	6.44E-07	4.82E+01	1.01E-06	6.28E+01	8.39E-07	6.28E+01
PU-52	1.58E+01	5.58E-07	4.45E+01	2.34E-03	4.45E+01	7.49E-07	5.98E+01	3.14E-03	5.98E+01

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INEL Waste Profile Sheet

ALLMW

ID-EGG-287-0

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

When no data are available, please refer to Section 3.7 of this report.

PHYSICAL/CHEMICAL COMPOSITION

When no data are available, please refer to Section 3.7 of this report.

A. IDENTIFICATION

INEL ID/Name: ID-EGG-287 UNCATEGORIZED (a-LLW)

C. Code/Name: 9999 PRE 73 DRUMS

B. DESCRIPTION**INEL ID (WMIS) Description:**

This waste stream was received prior to 1973. As container specific information was not entered into the database prior to 1973, these wastes are uncategorized. It is expected to be similar to other Rocky Flats wastes received since 1973.

Content Code Description:

Total Volume (m3): 3,007.86

Gross Mass (kg): 1,471,348.10

Drum Equivalents: 14,188.00

Physical Form: SOLID

Physical Type: UNKNOWN

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☒ Partially Combustible (10%-90%)☐ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-287-9999

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	14188	DRUM	3,007.86	1,471,348.10	PRE 73 DRUMS
Subtotal	14188		3,007.86	1,471,348.10	

Total 14,188**3,007.86 m3****1,471,348.10 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS					
D002	CORROSIVE				10.000
D006	CADMIUM		7440-43-9	10	10.000
D008	LEAD		7439-92-1	50.000	100.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	5.000	10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5	50.000	100.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		10.000
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6	2.000	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2	1.000	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1	25	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3	10	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	50	10.000
P015	BERYLLIUM DUST		7440-41-7	1.000	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

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22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-287-9999

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

PHYSICAL/CHEMICAL COMPOSITION

When no data are available, please refer to Section 3.7 of this report.

When no data are available, please refer to Section 3.7 of this report.

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288

UNKNOWN (a-LLW)

C. Code/Name: 102

ABSORBED LIQUIDS

B. DESCRIPTION**INEL ID (WMIS) Description:**

This waste has been determined to have insufficient RCRA characterization information available to assign EPA hazardous waste codes. It consists mainly of contaminated A-LLW trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 13.46

Gross Mass (kg): 6,300.00

Drum Equivalents: 63.51

Physical Form: SOLID

Physical Type: ABSORBENT MATERIALS

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled

Content Code Description:

This waste comes from Argonne National Laboratory-East. It consists of liquids adjusted to Ph 10 using NaOH which are then absorbed in vermiculite. No hazardous constituents have been identified in the waste.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-102

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
47	DRUM	9.96	5,000.00	ABSORBED LIQUIDS
1	BIN	3.50	1,300.00	ABSORBED LIQUIDS
Subtotal	48	13.46	6,300.00	

Total	48	13.46 m3	6,300.00 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)

UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	3.00E+03	2.30E+03
Totals		3.00E+03	2.30E+03

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	5.82E-02	6.31E-08	3.91E+00	5.23E-08	3.91E+00	8.10E-08	5.02E+00	6.71E-08	5.02E+00
PU-240	7.80E-03	1.30E-08	2.95E+00	1.34E-06	2.95E+00	1.68E-08	3.81E+00	1.73E-06	3.81E+00
TH-232	1.00E+01	7.87E-06	0.00E+00	2.19E-03	2.19E-03	1.04E-05	0.00E+00	2.89E-03	2.89E-03
U-235	2.65E+01	3.44E-05	0.00E+00	6.61E-02	6.61E-02	4.33E-05	0.00E+00	8.32E-02	8.32E-02
U-238	5.61E+02	2.38E-04	0.00E+00	7.98E-02	7.98E-02	3.07E-04	0.00E+00	1.03E-01	1.03E-01

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)	
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings		
		Other Glass		
	Metals -	Carbon Steel		
		Stainless Steel		
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal		
		Lead (Bulk Pb)		
		Other HVPM(Zn,Cd)		
	Misc. Non-Combustible -	Ceramic (molds)		
		Firebrick		
		Concrete		
		Portland Cement		
		Dirt/Soil		
		Ash		
		Oil-dri		
		Vermiculite	35.0	
		Salts		
	Filters/Insulation -	Glass Filter Media		
		Asbestos (filter, insulation)		
		Filter Dust		
	Inorganic Sludge -	Magnesia (insulations)		
Sludge High Na2O (1st Stage)				
Sludge High CaO (2nd Stage)				
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Aqueous Solutions	59.0	
		Leaded Rubber		
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelex/lead		
		Sheetrock		
		Plastics -	Polyethylene	4.8
			Polyvinyl Chloride (PVC)	1.2
Teflon	0.0			
<u>Combustibles</u> (>90% Combustible)	Rubber -	Plexiglass		
		Rubber		
	Misc. Combustibles -	Surgeons' Glove		
		Graphite (molds)		
		Paper		
		Wood		
		Cardboard		
Cloth				

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (VERMICULITE)			4-1, 2
WATER			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288

UNKNOWN (a-LLW)

C. Code/Name: 155

TRU SCRAP

B. DESCRIPTION**INEL ID (WMIS) Description:**

This waste has been determined to have insufficient RCRA characterization information available to assign EPA hazardous waste codes. It consists mainly of contaminated A-LLW trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 4.44

Gross Mass (kg): 828.00

Drum Equivalents: 20.95

Physical Form: SOLID

Physical Type: PLASTIC, CONTAMINATED EQUIPMENT

PCBs: ☐

Combustibility:

- ☐ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☒ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at Idaho National Engineering Laboratory, consists of a plastic glovebox, a hydraulic pump containing oil, vacuum pumps, centrifuges, tools, and experimental fuel capsules. The presence of hazardous materials is not known, but some absorbed oil is likely.

The drums are WIPP certifiable, but the box is not, due to the presence of free liquids. Gas generation potential for the boxes should be acceptable, since the organic content is minimal. Organic content of the box may exceed 6 lb/ft³. The levels of dispersible fines should be within WIPP-WAC limits. No sludges or free liquids should be present, except for the hydraulic pump oil in the box. No explosive or pyrophoric materials should be in this waste.

The waste was placed directly into prepared drums of boxes, or else packaged in 1-gallon cans which were placed in prepared drums. The waste was generated in 1975 and 1979. Some of the waste is double wrapped in plastic. It is not known if the box is FRP coated.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-155

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
6	DRUM	1.27	760.00	TRU SCRAP
1	BOX	3.17	68.00	TRU SCRAP
Subtotal	7	4.44	828.00	

Total 7**4.44 m3****828.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)

UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design-Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	8.50E+02	7.60E+02
Totals		8.50E+02	7.60E+02

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	5.82E-03	1.06E-08	6.56E-01	8.77E-09	6.56E-01	1.15E-08	7.15E-01	9.56E-09	7.15E-01
PU-242	7.88E-03	1.43E-08	5.63E-02	1.33E-10	5.63E-02	1.56E-08	6.13E-02	1.45E-10	6.13E-02
TH-232	1.04E+04	5.75E-02	0.00E+00	1.60E+01	1.60E+01	6.58E-02	0.00E+00	1.83E+01	1.83E+01
U-233	3.62E+01	1.19E-04	0.00E+00	1.15E+03	1.15E+03	1.40E-04	0.00E+00	1.36E+03	1.36E+03

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	1.0
	Metals -	Carbon Steel	10.0
		Stainless Steel	28.0
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	10.0
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
	Inorganic Sludge -	Magnesia (insulations)	
		Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Aqueous Solutions	
		Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Bonalex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	40.0
		Polyvinyl Chloride (PVC)	10.0
		Teflon	0.1
		Plexiglass	
	Rubber -	Rubber	1.0
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ORGANICS	6	LB/FT3	4-1
OTHER (HYDRAULIC PUMP, VACUUM PUMPS, CENTRIFUGE)			4-1, 2
PLASTIC (GLOVEBOX)			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288

UNKNOWN (a-LLW)

C. Code/Name: 156

CHEM CELL RIP-OUT

B. DESCRIPTION**INEL ID (WMIS) Description:**

This waste has been determined to have insufficient RCRA characterization information available to assign EPA hazardous waste codes. It consists mainly of contaminated A-LLW trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): #Error

Gross Mass (kg): #Error

Drum Equivalents: #Error

Physical Form: SOLID

Physical Type: METALS, ABSORBENT MATERIALS, RAGS, OTHER

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☒ Partially Combustible (10%-90%)☐ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream, generated at Idaho National Engineering Laboratory, contains steel piping, vessels, scaffolding, anti-contamination clothing, concrete, and welding slag.

The waste is WIPP certifiable. Gas generation potential should be acceptable, since the organic content is minimal. The levels of dispersible fines should be within WIPP-WAC limits. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in this waste.

Most of the waste was placed into prepared boxes at the ICPP. Some of the waste is double wrapped in plastic. The boxes are FRP-reinforced plywood. Absorbent was added if moisture was present.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

A&LMW

ID-EGG-288-156

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
9	BOX	28.53	11,000.00	CHEM CELL RIP-OUT
Subtotal 9		28.53	11,000.00	

Total #Error

#Error m3

#Error kg

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)

UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.10E+04	1.10E+04
Totals		1.10E+04	1.10E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

ID-EGG-288-156 contains both low-level (Interval 0) and transuranic (Intervals 1 through 34) waste. Since storage data for this content code have not been differentiated between low-level and transuranic classifications, all radiological characterization data for this content code are reported in this profile sheet. Low level and transuranic radionuclide and alpha activity concentration data are provided separately.

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
3	1,000 <= nCi/g < 2,000	2.50E+02	2.50E+02
Totals		2.50E+02	2.50E+02

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

Alpha Activity Distribution

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	4.70E+00	4.32E-07	2.68E+01	3.58E-07	2.68E+01	4.32E-07	2.68E+01	3.58E-07	2.68E+01

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	5.00E+00	2.00E-05	1.24E+03	1.66E-05	1.24E+03	2.00E-05	1.24E+03	1.66E-05	1.24E+03

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)	
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings		
		Other Glass		
	Metals -	Carbon Steel	12.5	
		Stainless Steel	31.1	
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal	41.4	
		Lead (Bulk Pb)	0.8	
		Other HVPM(Zn,Cd)	0.0	
	Misc. Non-Combustible -	Ceramic (molds)		
		Firebrick		
		Concrete		
		Portland Cement	1.5	
		Dirt/Soil		
		Ash		
		Oil-dri	3.2	
		Vermiculite	4.5	
		Salts		
		Filters/Insulation -	Glass Filter Media	
			Asbestos (filter, insulation)	
	Filter Dust			
Magnesia (insulations)				
Inorganic Sludge -	Sludge High Na2O (1st Stage)			
	Sludge High CaO (2nd Stage)			
	Aqueous Solutions			
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber		
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelex/lead		
		Sheetrock		
		Plastics -	Polyethylene	3.8
			Polyvinyl Chloride (PVC)	1.0
			Teflon	0.0
Plexiglass				
Rubber -	Rubber			
	Surgeons' Glove			
	Misc. Combustibles -	Graphite (molds)		
Paper		0.0		
Wood				
Cardboard				
Cloth				

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
CLOTHING (ANTI-CONTAMINATION)			4-1, 2
METAL (STEEL PIPING, WELDING SLAG)			4-1, 2
OTHER (CONCRETE, SCAFFOLDING)			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288

UNKNOWN (a-LLW)

C. Code/Name: 161

ANL-W ACL GLASSWARE, PAPER, POLY, AND
MISCELLANEOUS HARDWARE**B. DESCRIPTION****INEL ID (WMIS) Description:**

This waste has been determined to have insufficient RCRA characterization information available to assign EPA hazardous waste codes. It consists mainly of contaminated A-LLW trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): .42

Gross Mass (kg): 140.00

Drum Equivalents: 2.00

Physical Form: SOLID

Physical Type: PAPER, PLASTIC, CONTAMINATED EQUIPMENT

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☒ Partially Combustible (10%-90%)☐ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☐ Contact-Handled☒ Remote-Handled**Content Code Description:**

There is no content information on this code, which was generated at INEL. Hazardous materials that may be present in this waste are unknown at this time.

(ACL: Analytical Chemistry Laboratory)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-161

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
2	DRUM	0.42	140.00	ANL-W ACL GLASSWARE, PAPER, POLY, AND MISCELLANEOUS
Subtotal	2	0.42	140.00	

Total	2	.42 m3	140.00 kg
--------------	----------	---------------	------------------

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)

UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	2.50E+02	1.70E+02
Totals		2.50E+02	1.70E+02

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

ID-EGG-288-161 contains both low-level (Interval 0) and transuranic (Intervals 1 through 34) waste. Since storage data for this content code have not been differentiated between low-level and transuranic classifications, all radiological characterization data for this content code are reported in this profile sheet. Low level and transuranic radionuclide and alpha activity concentration data are provided separately.

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
3	1,000 <= nCi/g < 2,000	9.60E+01	7.30E+01
13	20,000 <= nCi/g < 30,000	8.90E+01	6.60E+01
Totals		1.85E+02	1.39E+02

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

Alpha Activity Distribution

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
AM-241	1.50E-03	1.36E-08	4.56E+01	8.18E-09	4.56E+01	1.88E-08	6.31E+01	1.13E-08	6.31E+01
PU-239	1.60E-01	6.43E-07	3.99E+01	5.33E-07	3.99E+01	9.24E-07	5.73E+01	7.65E-07	5.73E+01
U-235	3.18E-01	2.29E-06	0.00E+00	4.40E-03	4.40E-03	3.40E-06	0.00E+00	6.53E-03	6.53E-03

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	3.09E+01	3.46E-04	2.14E+04	2.87E-04	2.14E+04	4.63E-04	2.87E+04	3.84E-04	2.87E+04
U-235	1.17E+02	1.29E-03	0.00E+00	2.49E+00	2.49E+00	1.73E-03	0.00E+00	3.32E+00	3.32E+00

F. Design Basis Bulk Waste Materials**WASTE MATRIX CONSTITUENTS****PHYSICAL/CHEMICAL COMPOSITION**

Component	Conc.	Units of Conc.	Ref.
GLASS (GLASSWARE)			4-1, 2
PAPER			4-1, 2
PLASTIC (POLY)			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288

UNKNOWN (a-LLW)

C. Code/Name: 202

COMBUSTIBLE SOLIDS

B. DESCRIPTION**INEL ID (WMIS) Description:**

This waste has been determined to have insufficient RCRA characterization information available to assign EPA hazardous waste codes. It consists mainly of contaminated A-LLW trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 14.00

Gross Mass (kg): 2,760.00

Drum Equivalents: 66.04

Physical Form: SOLID

Physical Type: PLASTIC, RUBBER, OTHER

PCBs: ☐

Combustibility:

- ☒ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at Battelle Columbus Laboratories, contains such combustible items as wood, plastic suits, nylon reinforced plastic tent structures, shoe covers, rubber gloves, and air hose. The waste is from decontamination and deactivation of the plutonium laboratory.

The waste is WIPP certifiable. Organic material in the waste is subject to gas generation. The average wastes organic material content may range from 6 lb/ft³ (including the plywood liner) for bins to 8 lb/ft³ (excluding the 90 mil liner) for drums. No significant levels of fines should be present. The waste is packaged with no free liquids, sludges, explosives, compressed gases, pyrophoric or corrosive materials.

Each waste item is given a smear test and then triple-wrapped in nylon reinforced plastic or triple-bagged in PE bags. The items are then placed inside 55-gallon drums with 90-mil liners, or in type M-III bins with non-removable plywood liners. Type M-III bins have also been used to overpack 17H drums that do not meet INEL packaging criteria.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-202

C. STORAGE

	# of Conl.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	4	BIN	14.00	2,760.00	COMBUSTIBLE SOLIDS
Subtotal	4		14.00	2,760.00	

Total 4**14.00 m3****2,760.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)

UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.90E+03	9.80E+02
Totals		1.90E+03	9.80E+02

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclatures for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	0.1
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	3.7
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	0.0
		Misc. Non-Combustible -	
		Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	0.0
		Ash	
		Oil-dri	1.7
		Vermiculite	1.1
		Salts	
		Filters/Insulation -	
		Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
		Leaded Rubber	2.4
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	31.7
		Polyvinyl Chloride (PVC)	7.9
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	1.3
		Surgeons' Glove	7.7
	Misc. Combustibles -	Graphite (molds)	
		Paper	28.2
		Wood	4.8
		Cardboard	4.8
		Cloth	4.7

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
CLOTHING (SHOE COVERS)			4-1,2
ORGANICS	6 - 8	LB/FT3	4-1
PLASTIC (PLASTIC SUITS, NYLON REINF. PLASTIC)			4-1,2
RUBBER (GLOVES, AIR HOSE)			4-1,2
WOOD			4-1,2

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	1.20E+00	6.31E-07	3.92E+01	5.23E-07	3.92E+01	1.22E-06	7.59E+01	1.01E-06	7.59E+01

AIM

Association for Information and Image Management

1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910

301/587-8202

Centimeter

Inches

MANUFACTURED TO AIM STANDARDS
BY APPLIED IMAGE, INC.

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22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-203

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288

UNKNOWN (a-LLW)

C. Code/Name: 203

PAPER, METALS, GLASS

B. DESCRIPTION**INEL ID (WMIS) Description:**

This waste has been determined to have insufficient RCRA characterization information available to assign EPA hazardous waste codes. It consists mainly of contaminated A-LLW trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 21.00

Gross Mass (kg): 4,400.00

Drum Equivalents: 99.06

Physical Form: SOLID

Physical Type: PAPER, METAL, GLASS

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☒ Partially Combustible (10%-90%)☐ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream, generated at Battelle Columbus Laboratories, contains a mixture of combustible and noncombustible items in roughly equal proportions. Combustible items include paper and paper products. Noncombustibles are primarily metal and some glass.

This waste is WIPP certifiable. Gas generation potential should be acceptable, since the organic content is about 9 lb/ft3 in drums and about 5 lb/ft3 in bins. Combustibles, including packaging, may exceed 25 volume percent. The levels of dispersible fines should be within WIPP-WAC limits. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in this waste.

Prior to packaging, each waste item is given a smear test and then triple contained in either nylon reinforced plastic sheeting or PE bags. The waste is placed in 55 gallon drums fitted with 90 mil liners, or else placed in M-III bins. Some drums which do not meet INEL packaging criteria are also overpacked in bins.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-203

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
6	BIN	21.00	4,400.00	PAPER, METALS, GLASS
Subtotal 6		21.00	4,400.00	

Total 6**21.00 m3****4,400.00 kg**

1. Values in this table represent actual quantities in storage.
2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-203

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

HAZARDOUS CONSTITUENTS					
EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS					
D008	LEAD		7439-92-1	2.000	10.000
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHL	75-9-2	200	10.000
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7	50	10.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.50E+03	8.80E+02
Totals		1.50E+03	8.80E+02

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

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INEL Waste Profile Sheet

ALLMW

ID-EGG-288-203

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	8.00E-01	5.35E-07	3.31E+01	4.43E-07	3.31E+01	9.05E-07	5.61E+01	7.50E-07	5.61E+01

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INEL Waste Profile Sheet

ALLMW

ID-EGG-288-203

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)	
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings		
		Other Glass	17.0	
	Metals -	Carbon Steel	43.0	
		Stainless Steel		
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal	1.0	
		Lead (Bulk Pb)	6.0	
		Other HVPM(Zn,Cd)	0.0	
	Misc. Non-Combustible -	Ceramic (molds)		
		Firebrick		
		Concrete		
		Portland Cement		
		Dirt/Soil		
		Ash		
		Oil-dri		
		Vermiculite		
		Salts		
		Filters/Insulation -	Glass Filter Media	
Asbestos (filter, insulation)				
Filter Dust				
Magnesia (insulations)				
Inorganic Sludge -	Sludge High Na2O (1st Stage)			
	Sludge High CaO (2nd Stage)			
	Aqueous Solutions			
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber		
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelex/lead		
		Sheetrock		
		Plastics -	Polyethylene	5.6
			Polyvinyl Chloride (PVC)	1.4
			Teflon	0.0
Plexiglass				
Rubber -	Rubber		1.0	
	Surgeons' Glove			
Misc. Combustibles -	Graphite (molds)			
	Paper	10.0		
	Wood	5.0		
	Cardboard	5.0		
	Cloth	5.0		

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
GLASS	50	% VOL	4-1, 2
METAL	50	% VOL	4-1, 2
ORGANICS	5-9	LB/FT3	4-1
PAPER	50	% VOL	4-1, 2

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-204

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288

UNKNOWN (a-LLW)

C. Code/Name: 204

SOLIDIFIED SOLUTIONS

B. DESCRIPTION**INEL ID (WMIS) Description:**

This waste has been determined to have insufficient RCRA characterization information available to assign EPA hazardous waste codes. It consists mainly of contaminated A-LLW trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): .64

Gross Mass (kg): 729.00

Drum Equivalents: 3.00

Physical Form: SOLID

Physical Type: OTHER

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste comes from Battelle Columbus Labs. It is a Turco soap decontamination solution (used to decontaminated glove boxes from a Pu lab) which is solidified in Plaster-of-Paris.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-204

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
3	DRUM	0.64	729.00	SOLIDIFIED SOLUTIONS
Subtotal 3		0.64	729.00	

Total 3**.64 m3****729.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-204

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)

UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS

When no Concentration Values are given, please refer to Section 3.7 of this report.

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INEL Waste Profile Sheet

ALLMW

ID-EGG-288-204

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	5.00E+02	4.50E+02
Totals		5.00E+02	4.50E+02

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

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INEL Waste Profile Sheet

ALLMW

ID-EGG-288-204

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	5.00E-01	1.01E-06	6.24E+01	8.34E-07	6.24E+01	1.11E-06	6.86E+01	9.17E-07	6.86E+01

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-204

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings Other Glass	
	Metals -	Carbon Steel Stainless Steel Aluminum (AL) Tantalum 10W Miscellaneous Metal Lead (Bulk Pb) Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds) Firebrick Concrete Portland Cement Dirt/Soil Ash Oil-dri Vermiculite Salts	50.0
	Filters/Insulation -	Glass Filter Media Asbestos (filter, insulation) Filter Dust Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage) Sludge High CaO (2nd Stage) Aqueous Solutions	50.0
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber Organic Sludge Uncemented Resin Cemented Resin Asphalt Benelex/lead Sheetrock	
		Plastics - Polyethylene Polyvinyl Chloride (PVC) Teflon Plexiglass	
<u>Combustibles</u> (>90% Combustible)	Rubber -	Rubber Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds) Paper Wood Cardboard Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
OTHER (TURCO SOAP DECON SOLN IN PLASTER OF PARIS)			4-1, 2

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-838

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288

UNKNOWN (a-LLW)

C. Code/Name: 838

<10 nCi/g NONCOMBUSTIBLE

B. DESCRIPTION**INEL ID (WMIS) Description:**

This waste has been determined to have insufficient RCRA characterization information available to assign EPA hazardous waste codes. It consists mainly of contaminated A-LLW trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): .21

Gross Mass (kg): 150.00

Drum Equivalents: 1.00

Physical Form: SOLID

Physical Type: UNKNOWN

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

There is little information on this code. One drum of this waste was mistakenly shipped in 1975 from Mound Laboratory to INEL instead of a commercial disposal facility. Mound records indicate that this drum is combustible waste. According to the assay information, this waste is not WIPP certifiable due to the low TRU concentration.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-838

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	DRUM	0.21	150.00	<10 nCi/g NONCOMBUSTIBLE
Subtotal 1		0.21	150.00	

Total 1**.21 m3****150.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-838

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)

UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS

When no Concentration Values are given, please refer to Section 3.7 of this report.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-838

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-838

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTSPHYSICAL/CHEMICAL COMPOSITION

Major Category	Minor Category	Constituent	Composition (wt%)		
<u>Non- Combustible</u> (<u><10% Combustible</u>)	Glass -	Glass Rasching Rings			
		Other Glass			
	Metals -	Carbon Steel	2.0		
		Stainless Steel	1.0		
		Aluminum (AL)			
		Tantalum 10W			
		Miscellaneous Metal			
		Lead (Bulk Pb)	1.0		
		Other HVPM(Zn,Cd)	0.0		
	Misc. Non-Combustible -	Ceramic (molds)			
		Firebrick			
		Concrete			
		Portland Cement			
		Dirt/Soil	6.7		
		Ash			
		Oil-dri	3.0		
		Vermiculite			
		Salts			
		Filters/Insulation -	Glass Filter Media	6.7	
Asbestos (filter, insulation)					
Filter Dust					
Inorganic Sludge -	Magnesia (insulations)				
	Sludge High Na2O (1st Stage)				
	Sludge High CaO (2nd Stage)				
<u>Partial Combustible</u> (<u>10%-90% Combustible</u>)	Partially Combustible -	Aqueous Solutions			
		Leaded Rubber			
		Organic Sludge			
		Uncemented Resin			
		Cemented Resin			
		Asphalt			
		Benelox/lead			
		Sheetrock			
		<u>Combustibles</u> (<u>>90% Combustible</u>)	Plastics -	Polyethylene	32.0
				Polyvinyl Chloride (PVC)	8.0
Teflon	0.0				
Plexiglass	6.7				
Rubber -	Rubber				
Misc. Combustibles -	Surgeons' Glove				
	Graphite (molds)				
	Paper				
	Wood	33.0			
	Cardboard				
	Cloth				

When no data are available, please refer to Section 3.7 of this report.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-847

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288

UNKNOWN (a-LLW)

C. Code/Name: 847

LSA < 100 nCi/g COMBUSTIBLE

B. DESCRIPTION**INEL ID (WMIS) Description:**

This waste has been determined to have insufficient RCRA characterization information available to assign EPA hazardous waste codes. It consists mainly of contaminated A-LLW trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 152.85

Gross Mass (kg): 84,700.01

Drum Equivalents: 721.00

Physical Form: SOLID

Physical Type: PLASTIC, PAPER, RUBBER

PCBs: ☐

Combustibility:

- ☒ Combustible (>90%)
☐ Partially Combustible (10%-90%)
☐ Noncombustible (<10%)

Waste Type

☐ ALLW ☒ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream is from Mound Laboratory and consists of nonline generated combustible wastes such as plastic sheeting, paper, reagents, gloves (rubber, cloth), plastic bottles, wood, paper suits, and shoe covers. About 75% of the waste is compacted. The waste may be either dry or damp.

The waste is WIPP certifiable, but since it is mostly low specific activity (LSA) it will not require shipment to WIPP. Organic material in the waste is subject to gas generation. The average waste organic material content usually exceeds 14 lb/t3 for drums. Levels of fines should be within WIPP-WAC limits. There should be no sludges, free liquids, explosives, compressed gases, pyrophoric, toxic, or corrosive materials.

Combustibles were packed into plastic bags which were sealed and compacted inside prepared drums. The compaction ratio is about 4:1. About 25% of the waste is not compacted, due to the presence of noncompactible items such as wood. Drums were prepared according to post-1972 procedures. Prior to January 1982, drums were scanned for gamma radiation and assayed if readings above background levels were detected. After 1982, all drums were assayed.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-847

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
721	DRUM	152.85	84,700.01	LSA < 100 nCi/g COMBUSTIBLE
Subtotal 721		152.85	84,700.01	

Total 721**152.85 m3****84,700.01 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)

UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS

When no Concentration Values are given, please refer to Section 3.7 of this report.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-847

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-847

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	1.0
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	
		Vermiculite	10.0
		Salts	
		Filters/Insulation -	
		Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	28.0
		Polyvinyl Chloride (PVC)	7.0
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	1.0
		Surgeons' Glove	8.0
	Misc. Combustibles -	Graphite (molds)	
		Paper	30.0
		Wood	5.0
		Cardboard	5.0
		Cloth	5.0

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
CLOTHING (GLOVES)			4-1
CLOTHING (PAPER SUITS AND SHOE COVERS)			4-1
ORGANICS	14	LB/FT3	4-1
PAPER			4-1
PLASTIC (SHEETING, PLASTIC BOTTLES)			4-1
RUBBER (GLOVES)			4-1
WOOD			4-1

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-848

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288

UNKNOWN (a-LLW)

C. Code/Name: 848

LSA < 100nCi/g NONCOMBUSTIBLE

B. DESCRIPTION**INEL ID (WMIS) Description:**

This waste has been determined to have insufficient RCRA characterization information available to assign EPA hazardous waste codes. It consists mainly of contaminated A-LLW trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 27.14

Gross Mass (kg): 12,420.00

Drum Equivalents: 128.00

Physical Form: SOLID

Physical Type: CONTAMINATED EQUIPMENT, GLASS, SOIL, METAL

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream, generated at Mound Laboratory, consists of nonline generated noncombustible wastes such as tools, pipe, equipment, metal, glass, concrete, plaster, bricks, and dirt. Limited amounts of combustible wastes such as paper, rags, etc. are also included.

The waste is not presently WIPP certifiable due to the potential presence of excessive fines. Fines which may be present include soil, plaster, and concrete chips. Gas generation potential is minimal, since the organic content is less than 14 lb/ft3. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in this waste.

This waste stream is packaged in drums. Depending on size and contamination levels of individual items, the waste is contained in one or two plastic bags or placed directly into prepared waste drums. Each drum is lined with a 90 mil liner and a plastic bag. Florco absorbent is added to the bottom of the drum if dampness is suspected. Plywood spacers are added as needed on top of the liner lid. Each barrel is assayed by a drum counter or by portable gamma detecting instruments.

[Note: Content code name and/or description incorrectly states or infers that waste is transuranic.]

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-848

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	128	DRUM	27.14	12,420.00	LSA < 100nCi/g NONCOMBUSTIBLE
Subtotal	128		27.14	12,420.00	

Total	128	27.14 m3	12,420.00 kg
--------------	------------	-----------------	---------------------

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-848

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)

UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-288-848

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

When no data are available, please refer to Section 3.7 of this report.

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)	
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings		
		Other Glass	2.0	
	Metals -	Carbon Steel	20.0	
		Stainless Steel	20.0	
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal	1.0	
		Lead (Bulk Pb)		
		Other HVPM(Zn,Cd)	0.0	
	Misc. Non-Combustible -	Ceramic (molds)		
		Firebrick	14.3	
		Concrete	10.0	
		Portland Cement		
		Dirt/Soil	14.3	
		Ash		
		Oil-dri		
		Vermiculite		
		Salts		
	Filters/Insulation -	Glass Filter Media		
		Asbestos (filter, insulation)		
		Filter Dust		
Inorganic Sludge -	Magnesia (insulations)			
	Sludge High Na2O (1st Stage)			
	Sludge High CaO (2nd Stage)			
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Aqueous Solutions		
		Leaded Rubber		
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelex/lead		
		Sheetrock	14.3	
		Plastics -	Polyethylene	1.6
			Polyvinyl Chloride (PVC)	0.4
Teflon	0.0			
<u>Combustibles</u> (>90% Combustible)	Rubber -	Plexiglass		
		Rubber		
	Misc. Combustibles -	Surgeons' Glove		
		Graphite (molds)		
		Paper	1.0	
		Wood	1.0	
		Cardboard		
Cloth				

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (FLORCO)			4-1
GLASS			4-1
METAL (TOOLS,PIPE, EQUIPMENT)			4-1
ORGANICS	14	LB/FT3	4-1
OTHER (CONCRETE, PLASTER, BRICKS)			4-1
PAPER			4-1
RAGS			4-1
SOIL (DIRT)			4-1

22-Mar-94

INEL Waste Profile Sheet

ALLMW

NR-NRF-190-*

A. IDENTIFICATION

INEL ID/Name: NR-NRF-190 LEAD FILINGS

C. Code/Name: *

B. DESCRIPTION

INEL ID (WMIS) Description:

Previous name: this waste stream was previously named "lead ash." This waste stream is drill cuttings contaminated with lead.

Total Volume (m3): .03

Gross Mass (kg): 56.70

Drum Equivalents: .16

Physical Form: SOLID

Physical Type: METAL

PCBs: ☐

Combustibility:

☐ Combustible (>90%)

☐ Partially Combustible (10%-90%)

☒ Noncombustible (<10%)

Waste Type

☐ ALLW

☒ ALLMW

☐ TRUW

☐ TRUMW

Rad. Level

☒ Contact-Handled

☐ Remote-Handled

22-Mar-94

INEL Waste Profile Sheet

ALLMW

NR-NRF-190-*

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	DM	0.03	56.70	NRF LEAD ASH
Subtotal 1		0.03	56.70	

Total 1	.03 m3	56.70 kg
---------	--------	----------

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

NR-NRF-190-*

D. Design Basis EPA Contaminant Concentration Data

HAZARDOUS CONSTITUENTS

EPA Haz. Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		900.000

When no Concentration Values are given, please refer to Section 3.7 of this report.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

NR-NRF-190-*

E. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

When no data are available, please refer to Section 3.7 of this report.

22-Mar-94

INEL Waste Profile Sheet

ALLMW

NR-NRF-190-*

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

When no data are available, please refer to Section 3.7 of this report.

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
METAL (DRILL CUTTINGS CONTAMINATED WITH LEAD)	100	% WT	4-3

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- 4-7. IMWI Reference No. 7. Letter from S. A. Anderson, EG&G Rocky Flats, to S. M. Caregeorges, Benchmark Environmental Corporation, RCRA Part B Permit Information of Rocky Flats Waste—SAA-004.**
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- 4-16. IMWI Reference No. 16. EG&G Form 669R, Generator's Mixed Waste Radiological Profile, EG&G Idaho, April 1991.
- 4-17. IMWI Reference No. 17. EG&G Form 669R, Generator's Mixed Waste Radiological Profile, EG&G Idaho, February 1992.
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- 4-20. IMWI Reference No. 20. D. R. Tyson, Treatment Study of Turco Decon Solvents Generated from TAN (WERF Code #50-90), WROC-EDF-103, January 16, 1992.
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5. ALPHA LOW-LEVEL WASTE PROFILE SHEETS

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-102N-95

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102N UNCEMENTED INORGANIC SLUDGE (a-LLW)

C. Code/Name: 95 SLUDGE

B. DESCRIPTIONINEL ID (WMIS) Description:
Non hazardous a-LLW

Total Volume (m3): 4.88

Gross Mass (kg): 4,000.00

Drum Equivalents: 23.00

Physical Form: SOLID

Physical Type: SLUDGE

PCBs: ☐

Combustibility:

- ☐
- Combustible (>90%)
-
- ☐
- Partially Combustible (10%-90%)
-
- ☒
- Noncombustible (<10%)

Waste Type

☒ ALLW ☐ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant, is sewage sludge from cleaning stabilization ponds. The sludge may be moist or dry, and may consist of fines, chunks or pieces of dried cake. Shipment of sewer sludge to the INEL stopped in 1976.

The waste is uncertifiable (for WIPP) due to the high levels of fines. In addition the drums may be uncertifiable because the containers contain free liquids. The sewage sludge should contain less than 10 nCi/g TRU elements. Organic content in the sludge is not known. Some drums may be subject to gas generation. No free liquids should be present. No explosive, pyrophoric, or corrosive materials should be in the waste.

Sewer sludge was placed directly into prepared 55-gallon drums until 1974. Drums were prepared according to pre and post-1972 procedures. Portland cement was added to the bottom and top of the inner bag. If the sludge was moist, portland cement was also added in layers with the sludge. Since 1974, packaging was changed to 4 x 4 x 7 ft fiberglass-reinforced polyester (FRP) coated plywood boxes due to the pressure buildup in the drums. Each box was lined with a PE bag and a cardboard liner. About 90 lb of portland cement was added to the bottom and top of each box. Fissile content of the sewage was determined by radiochemical analysis of sludge samples.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-102N-95

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
23	DRUM	4.88	4,000.00	SLUDGE
Subtotal 23		4.88	4,000.00	

Total 23**4.88 m3****4,000.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-102N-95

D. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-102N-95

D. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	10.0
		Dirt/Soil	
		Ash	
		Oil-dri	
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (1st Stage)	44.5
		Sludge High CaO (2nd Stage)	44.5
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	0.8
		Polyvinyl Chloride (PVC)	0.2
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (PORTLAND CEMENT)	90	LBS/BOX	4-1
SLUDGE (SEWAGE SLUDGE)			4-1

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-102N-95

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-102N-995

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102N UNCEMENTED INORGANIC SLUDGE (a-LLW)

C. Code/Name: 995 SLUDGE

B. DESCRIPTIONINEL ID (WMIS) Description:
Non hazardous a-LLW

Total Volume (m3): 68.82

Gross Mass (kg): 60,400.00

Drum Equivalents: 324.62

Physical Form: SOLID

Physical Type: SLUDGE

PCBs: ☐

Combustibility:

- ☐
- Combustible (>90%)
-
- ☐
- Partially Combustible (10%-90%)
-
- ☒
- Noncombustible (<10%)

Waste Type

☒ ALLW ☐ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream, generated at the Rocky Flats Plant, is sewage sludge from cleaning stabilization ponds. This waste also contains a limited number of drums containing sludge generated by plutonium recovery operations. The sludge may be moist or dry, and may consist of fines, chunks or pieces of dried cake. Shipment of sewer sludge to the INEL stopped in 1976.

The waste is uncertifiable (for WIPP) due to the high levels of fines. In addition the drums may be uncertifiable because the containers contain free liquids. The sewage sludge should contain less than 10 nCi/g TRU elements. Organic content in the sludge is not known. Some drums may be subject to gas generation. No free liquids should be present. No explosive, pyrophoric, or corrosive materials should be in the waste.

Sewer sludge was placed directly into prepared 55-gallon drums until 1974. Drums were prepared according to pre and post-1972 procedures. Portland cement was added to the bottom and top of the inner bag. If the sludge was moist, portland cement was also added in layers with the sludge. Since 1974, packaging was changed to 4 x 4 x 7 ft fiberglass-reinforced polyester (FRP) coated plywood boxes due to the pressure buildup in the drums. Each box was lined with a PE bag and a cardboard liner. About 90 lb of portland cement was added to the bottom and top of each box. Fissile content of the sewage was determined by radiochemical analysis of sludge samples.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-102N-995

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
205	DRUM	43.46	44,500.00	SLUDGE
8	BOX	25.36	15,900.00	SLUDGE
Subtotal	213	68.82	60,400.00	

Total 213**68.82 m3****60,400.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	2.00E+04	1.70E+04
Totals		2.00E+04	1.70E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclatures for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-102N-995

D. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	7.40E+00	3.65E-07	2.91E+01	1.53E-03	2.91E+01	4.24E-07	3.38E+01	1.78E-03	3.38E+01

E. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Reaching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	10.0
		Dirt/Soil	
		Ash	
		Oil-dri	
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
	Inorganic Sludge -	Magnesia (insulations)	
		Sludge High Na ₂ O (1st Stage)	44.5
		Sludge High CaO (2nd Stage)	44.5
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benoles/lead	
		Sheetrock	
	Plastics -	Polyethylene	0.8
		Polyvinyl Chloride (PVC)	0.2
		Teflon	0.0
<u>Combustibles</u> (>90% Combustible)	Plastics -	Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (PORTLAND CEMENT)			4-1
SLUDGE (SEWAGE SLUDGE, PLUTONIUM RECOVERY SLUDGE)			4-1

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INEL Waste Profile Sheet

ALLW

ID-EGG-102N-995

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-115N-960

A. IDENTIFICATION

INEL ID/Name: ID-EGG-115N CONCRETE - BRICK (a-LLW)

C. Code/Name: 960 CONCRETE, ASPHALT, ETC.

B. DESCRIPTIONINEL ID (WMIS) Description:
Non hazardous a-LLW

Total Volume (m3): 681.35

Gross Mass (kg): 451,900.03

Drum Equivalents: 3,213.93

Physical Form: SOLID

Physical Type: SOIL, OTHER

PCBs: ☐

Combustibility:

- ☐
- Combustible (>90%)
-
- ☐
- Partially Combustible (10%-90%)
-
- ☒
- Noncombustible (<10%)

Waste Type

- ☒
- ALLW
- ☐
- ALLMW
- ☐
- TRUW
- ☐
- TRUMW

Rad. Level

- ☒
- Contact-Handled
- ☐
- Remote-Handled

Content Code Description:

This waste, generated at the Rocky Flats Plant, is primarily concrete and asphalt with limited amounts of dirt and combustibles. The code was replaced by 374 in 1973. Content code 374 is considered under the soils, asphalt, and sands waste stream. The major source for this waste is concrete from removal of six reinforced-concrete aqueous treatment tanks. Other sources include concrete from cutouts for doorways, and asphalt from a spill. Information about the waste is not complete. The waste is packaged in standard RFP drums and boxes.

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INEL Waste Profile Sheet

ALLW

ID-EGG-115N-960

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
657	DRUM	139.28	130,000.01	CONCRETE, ASPHALT, ETC.
171	BOX	542.07	321,900.02	CONCRETE, ASPHALT, ETC.
Subtotal	828	681.35	451,900.03	

Total 828**681.35 m3****451,900.03 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	2.50E+04	2.40E+04
Totals		2.50E+04	2.40E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

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INEL Waste Profile Sheet

ALLW

ID-EGG-115N-960

D. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	4.40E+00	1.79E-07	1.42E+01	7.49E-04	1.42E+01	1.83E-07	1.46E+01	7.67E-04	1.46E+01

E. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings Other Glass	
	Metals -	Carbon Steel Stainless Steel Aluminum (AL) Tantalum 10W Miscellaneous Metal Lead (Bulk Pb) Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds) Firebrick Concrete Portland Cement Dirt/Soil Ash Oil-dri Vermiculite Salts	96.9 2.9
	Filters/Insulation -	Glass Filter Media Asbestos (filter, insulation) Filter Dust Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (1st Stage) Sludge High CaO (2nd Stage) Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber Organic Sludge Uncemented Resin Cemented Resin Asphalt Benelox/lead Sheetrock	
		Plastics -	
		Polyethylene Polyvinyl Chloride (PVC) Teflon Plexiglass	0.2 0.0 0.0
<u>Combustibles</u> (>90% Combustible)	Rubber -	Rubber Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds) Paper Wood Cardboard Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
COMBUSTIBLES			4-1
OTHER (CONCRETE AND ASPHALT)			4-1
SOIL			4-1

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-115N-960

A. IDENTIFICATION

INEL ID/Name: ID-EGG-134N MISCELLANEOUS(PAPER,METAL, ETC.) (a-LLW)

C. Code/Name: 825

NONCOMBUSTIBLE EQUIPMENT DRUMS

B. DESCRIPTIONINEL ID (WMIS) Description:
Non hazardous a-LLW

Total Volume (m3): 16.09

Gross Mass (kg): 5,900.00

Drum Equivalents: 75.91

Physical Form: SOLID

Physical Type: CONTAMINATED EQUIPMENT, PLASTIC, ABSORBENT MATERIALS

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☒ Partially Combustible (10%-90%)☐ Noncombustible (<10%)

Waste Type

☒ ALLW☐ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream, generated at Mound Laboratory, is similar to content code 824 except that the waste items are smaller and can fit inside drums. The stream consists of noncombustible wastes such as small tanks, piping, small valves, tools, hot plates, presses, grinders, metallurgical polishers, ringstands, concrete, floor tile, sheet metal, electric motors, pumps, metallurgical presses, dissolvers, ladders, vacuum sweeper filters, sweeper hose, and glass. Limited amounts of combustible wastes such as plastic tanks are also included.

The waste is certifiable (for WIPP). Gas generation potential is minimal, since the organic content is less than 14 lb/ft³. Respirable fines should be within limits. No sludges or free liquids should be present. No explosive or pyrophoric materials should be in this waste. Some emptied cylinders and fire extinguishers with opened valves are included in the waste.

The waste stream is packaged in drums except for one standard sized box, which should be correctly labeled content code 824. Some items are wiped down prior to packaging. Each item is generally single or double contained in plastic. Florco absorbent is added to the bottom of each drum. Plywood spacers are added between the drum liner and the drum lid. Each barrel is assayed.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
46	DRUM	9.75	4,100.00	NONCOMBUSTIBLE EQUIPMENT DRUMS
2	BOX	6.34	1,800.00	NONCOMBUSTIBLE EQUIPMENT DRUMS
Subtotal 48		16.09	5,900.00	

Total 48	16.09 m3	5,900.00 kg
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1. Values in this table represent actual quantities in short tons.
2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volume.

D. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	4.60E+02	3.90E+02
Totals		4.60E+02	3.90E+02

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

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INEL Waste Profile Sheet

ALLW

ID-EGG-134N-825

D. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-239	4.00E-01	1.31E-06	8.13E+01	1.09E-06	8.13E+01	1.42E-06	8.79E+01	1.17E-06	8.79E+01
PU-52	1.32E-01	1.10E-06	8.78E+01	4.61E-03	8.78E+01	1.47E-06	1.18E+02	6.18E-03	1.18E+02
U-235	3.00E+00	7.69E-05	0.00E+00	1.48E-01	1.48E-01	1.84E-04	0.00E+00	3.54E-01	3.54E-01

E. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)		
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Reaching Rings			
		Other Glass	22.7		
	Metals -	Carbon Steel	56.3		
		Stainless Steel	1.8		
		Aluminum (AL)			
		Tantalum 10W			
		Miscellaneous Metal	1.9		
		Lead (Bulk Pb)	8.7		
		Other HVPM(Zn,Cd)	0.0		
	Misc. Non-Combustible -	Ceramic (molds)			
		Firebrick			
		Concrete			
		Portland Cement			
		.Dirt/Soil			
		Ash			
		Oil-dri			
		Vermiculite			
		Salts			
		Filters/Insulation -	Glass Filter Media		
			Asbestos (filter, insulation)		
			Filter Dust		
Inorganic Sludge -		Magnesia (insulations)			
	Sludge High Na2O (1st Stage)				
	Sludge High CaO (2nd Stage)				
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Aqueous Solutions			
		Leaded Rubber			
		Organic Sludge			
		Uncemented Resin			
		Cemented Resin			
		Asphalt			
		Benelux/lead			
		Sheetrock			
		Plastics -	Polyethylene	0.4	
			Polyvinyl Chloride (PVC)	0.1	
			Teflon	0.0	
		<u>Combustibles</u> (>90% Combustible)	Plastics -	Plexiglass	
				Rubber	
Surgeons' Glove					
Misc. Combustibles -	Graphite (molds)				
	Paper		1.8		
	Wood		3.2		
	Cardboard		3.2		
	Cloth				

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (FLORCO)			4-1
GLASS			4-1
METAL (EQUIPMENT, TANKS, PIPING, VALVES, TOOLS)			4-1
METAL (SHEET METAL, ELECTRIC MOTORS, PUMPS)			4-1
ORGANICS	14	LB/FT ³	4-1
OTHER (CONCRETE, FLOOR TILE, LADDERS)			4-1
OTHER (VACUUM SWEEPER FILTERS, SWEEPER HOSE)			4-1

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INEL Waste Profile Sheet

ALLW

ID-EGG-134N-825

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INEL Waste Profile Sheet

ALLW

ID-EGG-137N-115

A. IDENTIFICATION

INEL ID/Name: ID-EGG-137N

NONMETAL MOLDS AND CRUCIBLES (a-LLW)

C. Code/Name: 115

CERTIFIED TRU GRAPHITE WASTE

B. DESCRIPTION

INEL ID (WMIS) Description:

Non hazardous a-LLW

Total Volume (m3): 1.06

Gross Mass (kg): 410.00

Drum Equivalents: 5.00

Physical Form: SOLID

Physical Type: OTHER

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☒ ALLW☐ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

Certified TRU (for WIPP) graphite waste consists of discarded graphite molds, laboratory equipment and furnace equipment (whole pieces) from plutonium casting of laboratory operations. The content codes certifiably packaged and renamed 115 are 300, 302, and 312.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

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INEL Waste Profile Sheet

ALLW

ID-EGG-137N-115

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
5	DRUM	1.06	410.00	CERTIFIED TRU GRAPHITE WASTE
Subtotal	5	1.06	410.00	

Total 5**1.06 m3****410.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volume.

D. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	4.10E+02	2.60E+02
Totals		4.10E+02	2.60E+02

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

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INEL Waste Profile Sheet

ALLW

ID-EGG-137N-115

D. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
PU-52	5.05E-02	1.23E-07	9.80E+00	5.15E-04	9.80E+00	1.95E-07	1.56E+01	8.18E-04	1.56E+01

E. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings Other Glass	
	Metals -	Carbon Steel Stainless Steel Aluminum (AL) Tantalum 10W Miscellaneous Metal Lead (Bulk Pb) Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds) Firebrick Concrete Portland Cement Dirt/Soil Ash Oil-dri Vermiculite Salts	1.3 5.0
	Filters/Insulation -	Glass Filter Media Asbestos (filter, insulation) Filter Dust Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage) Sludge High CaO (2nd Stage) Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber Organic Sludge Uncemented Resin Cemented Resin Asphalt Benelex/lead Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene Polyvinyl Chloride (PVC) Teflon Plexiglass	1.9 0.5 0.0
	Rubber -	Rubber Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds) Paper Wood Cardboard Cloth	89.3 2.1

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
OTHER (FURNACE AND LAB EQUIPMENT, GRAPHITE MOLDS)			4-1

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INEL Waste Profile Sheet

ALLW

ID-EGG-137N-115

A. IDENTIFICATION

INEL ID/Name: ID-EGG-137N NONMETAL MOLDS AND CRUCIBLES (a-LLW)

C. Code/Name: 310

GRAPHITE SCARFINGS

B. DESCRIPTIONINEL ID (WMIS) Description:
Non hazardous a-LLW

Total Volume (m3): .21

Gross Mass (kg): 100.00

Drum Equivalents: 1.00

Physical Form: SOLID

Physical Type: OTHER, ABSORBENT MATERIALS

PCBs: ☐

Combustibility:

- ☐
- Combustible (>90%)
-
- ☐
- Partially Combustible (10%-90%)
-
- ☒
- Noncombustible (<10%)

Waste Type

☒ ALLW ☐ ALLMW ☐ TRUW ☐ TRUMW

Rad. Level

☒ Contact-Handled ☐ Remote-Handled**Content Code Description:**

This waste stream was generated at the Rocky Flats Plant. Graphite scarfings are the pieces of graphite waste generated from scarfing or scraping graphite molds to remove adhered plutonium. The scarfings were not leached with nitric acid to recover plutonium, because the plutonium content was not at above-discard levels. Scarfings which had above-discard plutonium levels were leached and then identified as content code 311.

This waste is not WIPP certifiable due to excessive fines. This waste is almost entirely carbon powder and granules. The waste should be inert in storage, but it is essentially 100% combustible. The waste is packaged with no free liquids, sludges, explosives, compressed gases, pyrophoric or corrosive materials.

Scarfings are collected into 1-gallon PE bottles. Each bottle is sealed inside PVC and PE bags, and then assayed. About 15-20 bottles will fit into a drum. Drums were packed according to the usual pre-1972 and post 1972 procedures. Since 1972, the drums were also processed according to inspection and sealing procedures, and, since 1982, vermiculite instead of Oil-dri was placed on top of the outer sealed PE drum bag.

{Note: Content code name and/or description incorrectly states or infers that waste is transuranic.}

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	DRUM	0.21	100.00	GRAPHITE SCRAPINGS
Subtotal 1		0.21	100.00	

Total 1	.21 m3	100.00 kg
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1. Values in this table represent actual quantities in storage.
2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volume.

D. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

When no data are available, please refer to Section 3.7 of this report.

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INEL Waste Profile Sheet

ALLW

ID-EGG-137N-310

D. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

When no data are available, please refer to Section 3.7 of this report.

D. P

ISOTOPIC

E. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	0.1
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	0.0
		Misc. Non-Combustible -	
		Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	5.5
		Vermiculite	1.6
		Salts	
		Filters/Insulation -	
		Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
		Partially Combustible -	
<u>Partial Combustible</u> (10%-90% Combustible)		Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
		Plastics -	
<u>Combustibles</u> (>90% Combustible)		Polyethylene	3.0
		Polyvinyl Chloride (PVC)	0.7
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	86.6
		Paper	2.4
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)			4-1
ABSORBENT (VERMICULITE)			4-1
OTHER (GRAPHITE SCARFINGS, CARBON POWDERED GRANULES)			4-1

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INEL Waste Profile Sheet

ALLW

ID-EGG-137N-310

A. IDENTIFICATIONINEL ID/Name: **ID-EGG-137N** NONMETAL MOLDS AND CRUCIBLES (a-LLW)C. Code/Name: **370**

CRUCIBLE, LECO

B. DESCRIPTION

INEL ID (WMIS) Description:

Non hazardous a-LLW

Total Volume (m3): 4.88

Gross Mass (kg): 3,680.00

Drum Equivalents: 23.00

Physical Form: SOLID

Physical Type: OTHER, ABSORBENT MATERIALS

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☒ ALLW☐ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste stream includes blank Leco crucibles and caps used for sample analysis. The crucibles are 1 inch high by 1 inch diameter, made of fired silica based ceramic. The crucibles were used to calibrate the Leco analyzer, and contain fused amounts of accelerating metals (iron, tin, copper, titanium, stainless steel, etc.) used for blank calibration. The crucibles should be unbroken except for those generated prior to 1975, which were broken before packaging. Even when broken, there should be minimal respirable or dispersible fines which would not exceed the WIPP-WAC. The waste stream is certifiable (for WIPP).

The waste stream handling and packaging is as follows: blank crucibles and caps were placed into 1-gallon metal paint cans, about 150-200 per can. The can lid was placed and sealed with tape. each paint can was double-bagged out the glovebox in PVC or PE-PVC bags and placed in prepared 55-gallon drums, about 20-25 cans per drum. Prior to 1972, 90-mil sealed rigid liners were used in addition to the two PE bags.

Since 1972, drums were inspected (and corrected where needed) for free liquids, proper packaging, and proper content code. One to two quarts of Oil-dri was placed on the outer sealed PE drum bag. Starting in February 1982, 3-12 lb of vermiculite was used to fill the space between the outer drum bag and the rigid liner.

(Note: Content code name and/or description incorrectly states or infers that waste is transuranic.)

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INEL Waste Profile Sheet

ALLW

ID-EGG-137N-370

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	23	DRUM	4.88	3,680.00	CRUCIBLE, LECO
Subtotal	23		4.88	3,680.00	

Total	23	4.88 m3	3,680.00 kg
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1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volume.

D. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-137N-370

D. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt%)
<u>Non-Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings	
		Other Glass	
	Metals -	Carbon Steel	8.3
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM (Zn, Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	83.3
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	1.4
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	5.6
		Polyvinyl Chloride (PVC)	1.4
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	
<u>Combustibles</u> (>90% Combustible)			

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)			4-1
ABSORBENT (VERMICULITE)	3-12	LBS/DRUM	4-1
CERAMIC (LECO CRUCIBLES AND CAPS)			4-1
METAL(FUSED IRON, TIN COPPER, TITANIUM, STAINLESS)			4-1

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-137N-370

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-141N-425

A. IDENTIFICATION

INEL ID/Name: ID-EGG-141N PARTICULATE WASTES (a-LLW)

C. Code/Name: 425 FLUID BED ASH

B. DESCRIPTIONINEL ID (WMIS) Description:
Non hazardous a-LLW

Total Volume (m3): 1.27

Gross Mass (kg): 1,050.00

Drum Equivalents: 6.00

Physical Form: SOLID

Physical Type: OTHER

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☒ ALLW☐ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled**Content Code Description:**

This waste, generated at the Rocky Flats Plant, consists of ash generated from the experimental pilot and demonstration fluid bed incinerator plants. Combustibles used for experiments were contaminated with low levels of Pu. Ash is packaged in standard RFP drums. Drums were assayed and fissile quantities calculated.

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-141N-425

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
6	DRUM	1.27	1,050.00	FLUID BED ASH
Subtotal 6		1.27	1,050.00	

Total 6**1.27 m3****1,050.00 kg**

1. Values in this table represent actual quantities in storage.
2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

When no data are available, please refer to Section 3.7 of this report.

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-141N-425

D. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

When no data are available, please refer to Section 3.7 of this report.

D. F. 1

ISOTOPIC

E. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non- Combustible</u> (<10% Combustible)	Glass -	Glass Rasching Rings Other Glass	
	Metals -	Carbon Steel Stainless Steel Aluminum (AL) Tantalum 10W Miscellaneous Metal Lead (Bulk Pb) Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds) Firebrick Concrete Portland Cement Dirt/Soil Ash Oil-dri Vermiculite Salts	89.0 1.0 2.0
	Filters/Insulation -	Glass Filter Media Asbestos (filter, insulation) Filter Dust Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage) Sludge High CaO (2nd Stage) Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber Organic Sludge Uncemented Resin Cemented Resin Asphalt Benelex/lead Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene Polyvinyl Chloride (PVC) Teflon Plexiglass	6.4 1.6 0.0
	Rubber -	Rubber Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds) Paper Wood Cardboard Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
OTHER (ASH FROM FLUID BED INCINERATOR)			4-1

**6. PROFILE SHEETS CATEGORIZED AS TRANSURANIC
THAT MAY BE ALPHA LOW-LEVEL**

6. PROFILE SHEETS CATEGORIZED AS TRANSURANIC THAT MAY BE ALPHA LOW-LEVEL

Previous INEL reports have identified the profile sheets tabulated in this section as TRUMW or TRUW. The precise rationale used for the initial categorization of the indicated profile sheets as transuranic is not known. Based upon the interpretation of the current DOE 5820.2A definition of transuranic waste, these particular profile sheets should be considered ALLMW or ALLW for the purpose of waste treatment feasibility studies and related activities. A basis for the ALLW/ALLMW classification of each of the profile sheets is provided in the respective Content Code Description in Section B.

A. IDENTIFICATIONINEL ID/Name: **ID-EGG-132TN** METALS (TRU)C. Code/Name: **81** MET SAMPLES FISSILE**B. DESCRIPTION**

INEL ID (WMIS) Description:

Non hazardous TRU waste.

Total Volume (m3): 3.60

Gross Mass (kg): 1,400.00

Drum Equivalents: 17.00

Physical Form: SOLID

Physical Type: OTHER

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☒ ALLW☐ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☐ Contact-Handled☒ Remote-Handled**Content Code Description:**

There is not content information on this code, which was generated at Bettis Atomic Power Laboratory.

ID-EGG-132TN-81 is currently classified as TRUW by the Idaho Mixed Waste Information database. The only radionuclide reported in TWDB for this wastestream is Th-232 and U-233. Since thorium and uranium have atomic numbers of 90 and 92 respectively, they are not usually considered to be a transuranium radionuclides, as defined in DOE Order 5820.2A. Since the TRU alpha activity concentration for ID-EGG-132TN-81 is less than 100 nCi/g, this wastestream may be ALLW, and should be considered as such for INEL waste treatment feasibility studies.

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-132TN-81

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
17	DRUM	3.60	1,400.00	MET SAMPLES FISSILE
Subtotal 17		3.60	1,400.00	

Total 17**3.60 m3****1,400.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-132TN-81

D. Design Basis Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.40E+03	8.40E+02
		1.40E+03	8.40E+02

Totals

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass—Container net mass+waste mass. Waste Mass = Mass of Waste only.

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-132TN-81

D. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

When no data are available, please refer to Section 3.7 of this report.

E. Design Basis Bulk Waste Materials**WASTE MATRIX CONSTITUENTS**

When no data are available, please refer to Section 3.7 of this report.

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
METAL (METAL SAMPLES FISSILE)			4-2

AIM

Association for Information and Image Management

1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910
301/587-8202

Centimeter

Inches

MANUFACTURED TO AIM STANDARDS
BY APPLIED IMAGE, INC.

8 of 8

A. IDENTIFICATIONINEL ID/Name: **ID-EGG-144TN** RADIOACTIVE SOURCES (TRU)C. Code/Name: **12** MISCELLANEOUS SOURCES**B. DESCRIPTION**

INEL ID (WMIS) Description:

Non hazardous TRU waste.

Total Volume (m3): .21

Gross Mass (kg): 160.00

Drum Equivalents: 1.00

Physical Form: SOLID

Physical Type: OTHER

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☐ Partially Combustible (10%-90%)☒ Noncombustible (<10%)

Waste Type

☒ ALLW☐ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☐ Contact-Handled☒ Remote-Handled**Content Code Description:**

There is no content information on this codes, which was generated at Bettis Atomic Power laboratory.

ID-EGG-144TN-12 is currently classified as TRUW by the Idaho Mixed Waste Information database. The only radionuclide reported in TWDB for this wastestream is Ra-226. Since radium has an atomic number of 88 it is not usually considered to be a transuranium radionuclide, as defined in DOE Order 5820.2A. Since the TRU alpha activity concentration for ID-EGG-144TN-12 is less than 100 nCi/g. this wastestream may be ALLW, and should be considered as such for INEL waste treatment feasibility studies.

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-144TN-12

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	1	DRUM	0.21	160.00	MISCELLANEOUS SOURCES
Subtotal	1		0.21	160.00	

Total 1**.21 m3****160.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	1.60E+02	1.30E+02
Totals		1.60E+02	1.30E+02

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS Pu), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-144TN-12

D. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.

ISOTOPIC COMPOSITION PROFILE

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
RA-226	4.86E-02	3.04E-07	0.00E+00	6.81E+02	6.81E+02	3.75E-07	0.00E+00	8.41E+02	8.41E+02

E. Design Basis Bulk Waste Materials**WASTE MATRIX CONSTITUENTS**

When no data are available, please refer to Section 3.7 of this report.

PHYSICAL/CHEMICAL COMPOSITION

When no data are available, please refer to Section 3.7 of this report.

22-Mar-94

INEL Waste Profile Sheet

ALLW

ID-EGG-144TN-12

A. IDENTIFICATION

INEL ID/Name: ID-EGG-144T

RADIOACTIVE SOURCES (TRU)

C. Code/Name: 40

SOLID BINARY SCRAP POWDER, ETC.

B. DESCRIPTION

INEL ID (WMIS) Description:

Sample fuel Pu & Am and hot-cell waste.

Total Volume (m3): 36.46

Gross Mass (kg): 38,000.00

Drum Equivalents: 172.00

Physical Form: SOLID

Physical Type: METAL, OTHER

PCBs: ☐

Combustibility:

☐ Combustible (>90%)☒ Partially Combustible (10%-90%)☐ Noncombustible (<10%)

Waste Type

☐ ALLW☒ ALLMW☐ TRUW☐ TRUMW

Rad. Level

☐ Contact-Handled☒ Remote-Handled**Content Code Description:**

This waste stream, generated at Bettis Atomic Power Laboratory, contains solid binary scrap as powder, pellets, or rods. The material is made of ceramic based UO₂ and ThO₂. Some "kilorods" or fuel rods constructed of fuel pellets within hollow zirconium tubes are also included.

Some of this waste is WIPP certifiable. Fuel rods (kilorods) in 6m drums are certifiable. Drums containing binary scrap powder or powder and pellet mixtures are not certifiable due to the potential of excessive fines. Gas generation potential should be acceptable, since the organic content (excluding plywood spacers) is probably less than 1 lb/ft³. Combustibles, including packaging, may exceed 25 volume percent. No sludges or free liquids should be present. No explosive or pyrophoric material should be in this wastes. Trace amounts of nitric acid contamination may be present.

Binary scrap powder and pellets are packaged in tin plated steel cans. The sizes of these cans are 3-1/4 inch in diameter and 7 inches high or 4-3/8 inches in diameter and 24 inches high. Each can is wrapped in plastic. Three cans are placed in each drum. Kilorods are placed in plastic lined 5 inch diameter pipes placed in either 55- or 100-gallon drums. Between 18-20 rods are placed in each 100-gallon drum and 10-11 rods are placed in each 55-gallon drum. The drums which contain kilorods have 3/4 to 1 inch thick lead shielding. Fissile content for the drums was determined by weight difference calculations, chemical analysis, assay gauge, or by individual fuel rod values.

ID-EGG-144T-40 is currently classified as TRUMW by the Idaho Mixed Waste Information database. The only radionuclide reported in TWDB for this wastestream is Th-232 and U-233. Since thorium and uranium have atomic numbers of 90 and 92 respectively, they are not usually considered to be transuranium radionuclides, as defined in DOE Order 5820.2A. Since the TRU alpha activity concentration for ID-EGG-144T-40 is less than 100 nCi/g, this wastestream may be ALLMW, and should be considered as such for INEL waste treatment feasibility studies.

23-Mar-94

INEL Waste Profile Sheet

ALLMW

ID-EGG-144T-40

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	172	DRUM	36.46	38,000.00	SOLID BINARY SCRAP POWDER, ETC.
Subtotal	172		36.46	38,000.00	

Total 172**36.46 m3****38,000.00 kg**

1. Values in this table represent actual quantities in storage.

2. Gross mass = Net container mass + mass of waste. Volume is based on container estimated external volumes.

D. Design Basis EPA Contaminant Concentration Data**HAZARDOUS CONSTITUENTS**

EPA Haz Waste Code	Category	Chemical Constituent	Design Basis Information		
			CAS #	Estimated Conc. (mg/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD		7439-92-1		
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		

When no Concentration Values are given, please refer to Section 3.7 of this report.

E. Design Basis Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	3.80E+04	3.10E+04
Totals		3.80E+04	3.10E+04

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number greater than 92 and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included. All activity calculations are based on a 15 year post purification date or decay date. Fifteen years is a representative waste age average.

2. Values may not agree with those reported in Section C since values in this table are based on stored waste quantities for which radiological data are available.

3. Pu-52 and Pu-83 are database nomenclature for weapons grade plutonium (WG Pu) and heat source plutonium (HS P-), respectively. See Section 2 Table 2.2 for the nominal isotopic compositions.

4. Gross Mass=Container net mass+waste mass. Waste Mass = Mass of Waste only.

E. Design Basis Radionuclide and Alpha Activity Concentration Information, Cont'd.**ISOTOPIC COMPOSITION PROFILE**

Major Nuclide / Pu Mix	Nuclide / Pu Mix Mass (g)	Nuclide / Pu Mix Mass per Gross Mass (g/g)	TRU Alpha Activity per Gross Mass (nCi/g)	Non-TRU Alpha Activity per Gross Mass (nCi/g)	Total Alpha Activity per Gross Mass (nCi/g)	Nuclide / Pu Mix Mass per Waste Mass (g/g)	TRU Alpha Activity per Waste Mass (nCi/g)	Non-TRU Alpha Activity per Waste Mass (nCi/g)	Total Alpha Activity per Waste Mass (nCi/g)
TH-232	8.09E+06	3.11E-01	0.00E+00	8.64E+01	8.64E+01	3.91E-01	0.00E+00	1.09E+02	1.09E+02
U-233	3.59E+04	9.45E-04	0.00E+00	9.15E+03	9.15E+03	1.15E-03	0.00E+00	1.11E+04	1.11E+04

F. Design Basis Bulk Waste Materials**WASTE MATRIX CONSTITUENTS**

When no data are available, please refer to Section 3.7 of this report.

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
CERAMIC (BINARY SCRAP: POWDER, PELLETS OR RODS)			4-1
NITRIC ACID	FEW	PPM	4-1
ORGANICS	1	LB/FT3	4-1
OTHER (FUEL RODS WITH HOLLOW ZIRCONIUM TUBES)			4-1

7. INDEX BY CONTENT CODE

Table 7-1 provides a cross-reference to the INEL Waste Profile Sheet corresponding to a particular content code. When used in conjunction with the Table of Contents for Sections 4 and 5 of this document, this table will assist in location of information in the report.

Table 7-1. Cross-reference of alpha low-level content code numbers and INEL Profile Sheet page numbers.

Content code number	Content code name	INEL ID number	Waste type	INEL Profile Sheet page number
0	Not recorded-unknown	ID-EGG-287	ALLMW	4-443
1	First-stage sludge	ID-EGG-102	ALLMW	4-003
2	Second-stage sludge	ID-EGG-102	ALLMW	4-009
3	Organic setups, oil solids	ID-EGG-158	ALLMW	4-431
4	Special setups (cement)	ID-EGG-112	ALLMW	4-059
5	Evaporator salts	ID-EGG-146	ALLMW	4-425
7	Building 374 dry sludge	ID-EGG-102	ALLMW	4-017
10	Combustibles	ID-EGG-114	ALLMW	4-107
12	Miscellaneous sources	ID-EGG-144TN	ALLW	6-011
20	Noncompressible, noncombustible	ID-EGG-132	ALLMW	4-263
30	Solidified grinding sludge, etc.	ID-EGG-102	ALLMW	4-023
40	Solid binary scrap powder, etc.	ID-EGG-144T	ALLMW	6-017
81	Met samples fissile	ID-EGG-132TN	ALLW	6-005
90	Dirt	ID-EGG-141	ALLMW	4-353
95	Sludge ^a	ID-EGG-102N	ALLW	5-003
100	General plant waste	ID-EGG-134	ALLMW	4-299
101	Cut-up gloveboxes	ID-EGG-134	ALLMW	4-305
102	Absorbed liquids	ID-EGG-288	ALLMW	4-455
104	Alpha hot cell waste	ID-EGG-144	ALLMW	4-389
111	WIPP precertified, RGW noncompactible solids or certified solids wet sludge	ID-EGG-102	ALLMW	4-029
112	Solid organics	ID-EGG-112	ALLMW	4-065
113	Certified solid lab waste	ID-EGG-102	ALLMW	4-035
114	Certified solid inorganic process solution	ID-EGG-112	ALLMW	4-071
115	Certified TRU graphite waste	ID-EGG-137N	ALLW	5-027
116	Certified TRU combustible waste	ID-EGG-114	ALLMW	4-113

Table 7-1. (continued).

Content code number	Content code name	INEL ID number	Waste type	INEL Profile Sheet page number
117	Certified TRU metal waste	ID-EGG-132	ALLMW	4-269
118	Certified TRU glass waste	ID-EGG-119	ALLMW	4-215
119	Certified TRU HEPA filter waste	ID-EGG-118	ALLMW	4-173
121	WIPP precertified DDW noncombustible solids	ID-EGG-134	ALLMW	4-311
122	Certified TRU inorganic solid waste	ID-EGG-115	ALLMW	4-155
123	Certified TRU leaded rubber	ID-EGG-120	ALLMW	4-239
150	Laboratory waste	ID-EGG-141	ALLMW	4-359
153	Combustible lab waste	ID-EGG-144	ALLMW	4-395
154	Sample fuel	ID-EGG-144	ALLMW	4-401
155	TRU scrap	ID-EGG-288	ALLMW	4-461
156	Chem cell rip-out	ID-EGG-288	ALLMW	4-467
161	ANL-W ACL glassware, paper, poly, and miscellaneous hardware	ID-EGG-288	ALLMW	4-473
201	Noncombustible solids	ID-EGG-134	ALLMW	4-317
202	Combustible solids	ID-EGG-288	ALLMW	4-479
203	Paper, metals, glass	ID-EGG-288	ALLMW	4-485
204	Solidified solutions	ID-EGG-288	ALLMW	4-491
241	Americium process residue	ID-EGG-134	ALLMW	4-323
292	Cemented sludge	ID-EGG-102	ALLMW	4-041
300	Graphite	ID-EGG-137	ALLMW	4-341
301	Graphite cores	ID-EGG-137	ALLMW	4-347
302	Benelex and Plexiglas ^b	ID-EGG-109	ALLMW	4-047
310	Graphite scarfings	ID-EGG-137N	ALLW	5-033
320	Tantalum	ID-EGG-132	ALLMW	4-275
328	Fulflo incinerator filters	ID-EGG-118	ALLMW	4-179
330	Dry paper and rags	ID-EGG-114	ALLMW	4-119
335	Absolute 8 × 8 filters	ID-EGG-118	ALLMW	4-185
336	Moist paper and rags	ID-EGG-114	ALLMW	4-125
337	Plastics, teflon, wash, PVC	ID-EGG-114	ALLMW	4-131
338	Insulation and CWS filter media	ID-EGG-118	ALLMW	4-191
339	Leaded rubber gloves and aprons ^b	ID-EGG-120	ALLMW	4-245

Table 7-1. (continued).

Content code number	Content code name	INEL ID number	Waste type	INEL Profile Sheet page number
360	Insulation	ID-EGG-118	ALLMW	4-197
370	Crucible, LECO	ID-EGG-137N	ALLW	5-039
371	Firebrick	ID-EGG-115	ALLMW	4-161
372	Grit	ID-EGG-141	ALLMW	4-365
374	Blacktop, concrete, dirt, and sand	ID-EGG-141	ALLMW	4-371
375	Oil-Dri residue from incinerator	ID-EGG-115	ALLMW	4-167
376	Cemented insulation/filter media	ID-EGG-118	ALLMW	4-203
425	Fluid bed ash	ID-EGG-141N	ALLW	5-045
430	Unleached iron column resin	ID-EGG-145	ALLMW	4-407
431	Leached resin	ID-EGG-145	ALLMW	4-413
432	Leached and cemented resin	ID-EGG-145	ALLMW	4-419
440	Glass	ID-EGG-119	ALLMW	4-221
441	Unleached Raschig rings	ID-EGG-119	ALLMW	4-227
442	Leached Raschig rings	ID-EGG-119	ALLMW	4-233
463	Leaded rubber gloves and aprons ^c	ID-EGG-120	ALLMW	4-251
464	Benelex and Plexiglas ^b	ID-EGG-109	ALLMW	4-053
480	Nonspecial source metal	ID-EGG-132	ALLMW	4-281
481	Leached nonspecial source metal	ID-EGG-132	ALLMW	4-287
490	CWS filters	ID-EGG-118	ALLMW	4-209
803	Metal, equipment, pipes, valves, etc.	ID-EGG-132	ALLMW	4-293
824	Noncombustible equipment boxes	ID-EGG-134	ALLMW	4-329
825	Noncombustible equipment drums	ID-EGG-134N	ALLW	5-021
826	Combustible equipment boxes or floor sweepings and rust	ID-EGG-114	ALLMW	4-137
834	High-level acid	ID-EGG-112	ALLMW	4-077
835	High-level caustic	ID-EGG-112	ALLMW	4-083
836	High-level sludge/cement	ID-EGG-112	ALLMW	4-089
838	<10 nCi/g noncombustible	ID-EGG-288	ALLMW	4-497
842	Contaminated soil	ID-EGG-141	ALLMW	4-377
847	LSA <100 nCi/g combustible	ID-EGG-288	ALLMW	4-503
848	LSA <100 nCi/g noncombustible	ID-EGG-288	ALLMW	4-509

Table 7-1. (continued).

Content code number	Content code name	INEL ID number	Waste type	INEL Profile Sheet page number
900	LSA plastics, paper, etc.	ID-EGG-114	ALLMW	4-143
950	LSA metal, glass, etc.	ID-EGG-134	ALLMW	4-335
960	Concrete, asphalt, etc.	ID-EGG-115N	ALLW	5-015
970	Wood	ID-EGG-114	ALLMW	4-149
976	Building 776 process sludge	ID-EGG-112	ALLMW	4-095
978	Laundry sludge	ID-EGG-112	ALLMW	4-101
990	Dirt	ID-EGG-141	ALLMW	4-383
995	Sludge ^a	ID-EGG-102N	ALLW	5-009
9999	Pre-73 drums	ID-EGG-287	ALLMW	4-449
*	(No content code name assigned)	ID-EGG-127	ALLMW	4-257
*	(No content code name assigned)	ID-EGG-163	ALLMW	4-437
*	(No content code name assigned)	NR-NRF-190	ALLMW	4-515

a. Although content codes 95 and 995 have the same name, content code 995 also contains a limited number of drums of sludge generated by plutonium recovery operations.

b. Content code 302 was replaced by content code 464 in 1973.

c. Content code 339 was replaced by content code 463 in 1973.

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