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Radiological, Physical, and Chemical Characterization of Transuranic Wastes Stored at the Idaho National Engineering Laboratory

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ABSTRACT

This document provides radiological, physical and chemical characterization data for transuranic radioactive wastes and transuranic 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 (PSPI). 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 139 waste streams which represent an estimated total volume of 39,380 m³ corresponding to a total mass of approximately 19,000,000 kg. In addition, considerable information concerning alpha, beta, gamma, and neutron source term data specific to Rocky Flats Plant 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
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
EFL	Experimental Fuels Laboratory
ENSDF	Evaluated Nuclear Structure Data File
EPA	United States Environmental Protection Agency
EWR	Early waste retrieval
FCF	Fuel Cycle Facility
FFCA	Federal Facility Compliance Act
FMF	Fuel Manufacturing Facility
FRP	Fiberglass-reinforced polyester
HEDL	Hanford Engineering and Development Laboratory
HEPA	High-efficiency particulate air
HFEF	Hot Fuel Examination Facility
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
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 Transuranic Wastes Stored at the Idaho National Engineering Laboratory

1. INTRODUCTION

This document provides physical, chemical and radiological descriptive information for the transuranic mixed waste (TRUMW) and transuranic waste (TRUW) 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 Low-Level Alpha Contaminated Wastes Stored at the Idaho National Engineering Laboratory,"¹⁻¹ provides similar information for the alpha low-level mixed waste (ALLMW) and alpha low-level wastes (ALLW) 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 *transuranic waste* refers to waste material 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 assay. The term *hazardous waste* refers to waste defined as hazardous according to the Resource Conservation and Recover 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 TRUMW and TRUW. 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 of this report contains the INEL Waste Profile Sheets for the TRUMW, while Section 5 contains the INEL Waste Profile Sheets for the TRUW. Section 6 contains INEL waste profile sheets presently categorized as ALLMW or ALLW but which may be TRUMW or TRUW. 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 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. Such systems 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 so as 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 that 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, 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 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 as such alpha radiation must also 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 shield 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 EDF's 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 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 the *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
Content Code 312: Coarse Graphite
Content Code 814: Contaminated Mercury or Graphite

are categorized under the waste stream

ID-EGG-137T: Nonmetal Molds and Crucibles.

Waste descriptive information and physical, chemical and radiological data contained in this report are provided in accordance with the 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 TRUWs and TRUMWs 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 20 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.

Transuranic 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 TRUMW and TRUW.

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
15	Neutron sources
20	Noncompressible, noncombustible
30	Solidified grinding sludge, etc.
50	Solidified solutions
100	General plant waste
101	Cut-up gloveboxes
102	Absorbed liquids
104	Alpha hot cell waste
105	Empty bottles
106	Special source material
107	Uncertified TRU—RH waste
110	Research-generated waste compact
111	WIPP precertified, RGW noncompactible solids or certified solids wet sludge
112	Certified 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
120	DDW combustible solids
121	WIPP precertified DDW noncombustible solids
122	Certified TRU inorganic solid waste
123	Certified TRU leaded rubber
124	Certified TRU pyrochemical salt waste
150	Laboratory waste

Table 1-1. (continued).

Content code number	Content code name
151	Solidified fuel sludge
152	Pu neutron sources
153	Combustible lab waste
154	Sample fuel
155	TRU scrap
157	Miscellaneous sources
160	ANL-W HFEF analytical chemistry and metallographic combustibles
162	ANL-W FMF EFL ZR-U fuel casting alloys residues
163	ANL-W ACL cold-line absorbed liquid
200	Americium sources
201	Noncombustible solids
202	Combustible solids
203	Paper, metals, glass
204	Solidified solutions
241	Americium process residue
290	Filter sludge
292	Cemented sludge
300	Graphite
301	Graphite cores
302	Benelex and Plexiglas ^a
303	Scarfed graphite chunks
310	Graphite scarfings
311	Graphite heels
312	Coarse graphite
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 ^b
360	Insulation
361	Insulation heels
370	Crucible, LECO
371	Firebrick

Table 1-1. (continued).

Content code number	Content code name
372	Grit
374	Blacktop, concrete, dirt and sand
375	Oil-Dri residue from incinerator
376	Cemented insulation/filter media
391	Crucibles and sand
392	Sand, slag, and crucibles
393	Sand, slag, and crucible heels
409	Molten salts—30% unpulverized
410	Molten salts—30% pulverized
411	Electrorefining salt
412	Gibson salts
414	Direct oxide reduction salt
416	Zinc magnesium alloy metal
420	Virgin incinerator ash
421	Ash heels
422	Soot
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
460	Washables, rubber, plastics
463	Leaded rubber gloves and aprons ^b
464	Benelex and Plexiglas ^a
480	Nonspecial source metal
481	Leached nonspecial source metal
490	CWS filters
700	Organic and sludge immobilization
801	Plastic, Tygon, manipulator boots
802	Dry box gloves and o-rings
803	Metal, equipment, pipes, valves, etc.
804	Plastic, Tygon, manipulator boots
805	Asbestos filters

Table 1-1. (continued).

Content code number	Content code name
810	Glass, flasks, sample vials, etc.
811	Evaporator and dissolver sludge
813	Glass filters and fiberglass
814	Contaminated mercury or graphite
815	Classified parts
824	Noncombustible equipment boxes
825	Noncombustible equipment drums
826	Combustible equipment boxes or floor sweepings and rust
827	Combustible equipment drums
834	High-level acid
835	High-level caustic
836	High-level sludge/cement
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
980	Equipment
995	Sludge ^c
9999	Pre-73 drums

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

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

c. 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. (Note: Content Code 95 is not a TRUMW or TRUW content code.)

NOTE: INEL waste streams identified in this report but for which there are no identified content code numbers or names are not included in this table. The content code designation used in the Table of Contents and INEL Waste Profile Sheets for these waste streams is an asterisk (*).

1.4 References

- 1-1. Apel, M. L., G. K. Becker, Z. K. Ragan, J. Frasure, B. D. Raivo, L. G. Gale, and D. P. Pace, *Radiological, Physical and Chemical Characterization of Low-Level Alpha Contaminated Wastes Stored at the Idaho National Engineering Laboratory*, Idaho National Engineering Laboratory, EG&G Idaho, Inc., EGG-RWMC-11189, March 1994.
- 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 the processing of transuranic contaminated waste forms must include provisions to assure 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 transuranic (TRU) and/or non-transuranic (non-TRU) source material entrained within the waste matrices.

This source term data is developed and illustrated for retrievably-stored INEL 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 due to generators such as Mound Laboratory, Battelle Columbus Laboratories, and the Bettis Atomic Power Laboratory. Source term data associated with these generators are briefly addressed in this document. Due to the present unavailability of precise process source composition data for the non-RFP wastes, data for these wastes are not as complete as the RFP source characterization data. 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 associated with the non-RFP wastes need to be satisfactorily established and evaluated prior to processing.

The RFP alpha, electron, and photon source term data is 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 in all cases. These assumptions are as follows:

- Rocky Flats Plant source characteristics are due to the radionuclides and radionuclidic compounds as specified in Table 2-1
- Nominal isotopic composition of the two radionuclidic compounds specified in Table 2-1 is as per Table 2-2
- Source characterization data as specified account for and include the parent material 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 can not be calculated directly from the use of nuclear data and a specified set of parent radionuclides or compounds. This 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 SWEPP waste examination facility as a function of waste form, i.e., content code.

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 plutonium: 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

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, the 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 two components defined as TRU and non-TRU. 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 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.²⁻¹ The method and results illustrated in this section are based on previous work by Becker (1993).²⁻²

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.²⁻³ 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 accounted for.

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 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 is then determined by summing all computed decay chain member alpha activities within the category of interest.

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

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 weighed by the appropriate parent compound 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 the time zero purification date which is nominally 200 micrograms ^{241}Am per gram of WG Pu. No impurities are identified for the HS Pu alpha activity calculations.

As indicated in the assumption 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 assumed that the radon isotopes will quickly 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 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, i.e., alpha emitters with atomic numbers less than or equal to 92 and/or half-lives less than 20 years.

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 associated continuous 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.²⁻⁴

The total atomic electron source term per parent 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.²⁻³ 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 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. This value is then multiplied by the disintegration rate of a given radionuclide to arrive at the electron energy emission rate in keV/sec. 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 in the determination of 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 a modified 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 to establish a baseline for its subsequent use. As with the alpha and electron source terms, all photon source term data is based on an initial one-gram 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 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.

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

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 at 15 years.

The exception to this method involves the isotopes of the radon nuclide as indicated in the alpha and electron source term sections. 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, note that there are several radionuclides that have spontaneous fission branches. Since a spontaneous fission event leads to many different daughter nuclides, the associated γ -rays will be very weak and therefore have 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 the 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 since 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 as a reasonable compromise between data manipulation complications and data integrity as processed for input to V shielding 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 of the source. 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 15 year decay time due to an initial time zero parent or parent compound mass of one gram. Note 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.

**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	3.65E+08	1.825	9.22E+08
75	3.16E+11	975	1.32E+09	1.875	0.00E+00
125	6.08E+09	1.025	0.00E+00	1.925	0.00E+00
175	1.17E+09	1.075	5.88E+09	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	2.50E+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	5.31E+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+09	2.425	0.00E+00
675	1.01E+08	1.575	0.00E+00	2.475	0.00E+00
725	5.20E+10	1.625	1.14E+10	2.525	0.00E+00
775	1.38E+10	1.675	6.16E+08	2.575	0.00E+00
825	1.13E+08	1.725	5.63E+06	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)**

Bin Midpoint keV	Gamma Emission photons/sec-g	Bin 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	5.88E+09	2.225	1.89E+09
75	9.84E+09	1.175	6.85E+08	2.275	1.38E+08
125	0.00E+00	1.225	2.43E+09	2.325	1.34E+07
175	0.00E+00	1.275	5.88E+08	2.375	7.04E+06
225	2.84E+09	1.325	9.07E+07	2.425	5.90E+06
275	7.67E+09	1.375	1.82E+09	2.475	7.80E+05
325	1.51E+08	1.425	1.46E+09	2.525	2.23E+06
375	1.40E+10	1.475	3.06E+07	2.575	1.49E+05
425	1.15E+08	1.525	1.12E+09	2.625	5.07E+05
475	5.44E+08	1.575	5.00E+08	2.675	1.34E+07
525	1.69E+08	1.625	7.06E+06	2.725	6.69E+05
575	1.51E+08	1.675	5.51E+08	2.775	1.19E+07
625	1.75E+10	1.725	1.15E+09	2.825	9.28E+05
675	6.55E+08	1.775	6.04E+09	2.875	6.04E+06
725	4.14E+08	1.825	9.54E+08	2.925	7.27E+06
775	2.47E+09	1.875	2.10E+08	2.975	9.33E+06
825	8.18E+08	1.925	1.93E+07	3.025	0.00E+00
875	0.00E+00	1.975	2.04E+06	3.075	1.04E+07
925	1.25E+09	2.025	2.69E+07	3.125	7.27E+05
975	0.00E+00	2.075	5.14E+07	3.175	7.52E+05
1.025	0.00E+00	2.125	4.95E+08	3.225	7.43E+04
1.075	0.00E+00	2.175	2.45E+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- η	Bin Midpoint keV	Gamma Emission photons/sec- η	Bin Midpoint keV	Gamma Emission photons/sec- η
25	1.06E+06	1.125	8.25E+05	2.225	2.65E+05
75	4.28E+05	1.175	9.61E+04	2.275	1.94E+04
125	3.72E+05	1.225	3.41E+05	2.325	1.67E+03
175	2.32E+05	1.275	7.82E+04	2.375	9.87E+02
225	3.93E+05	1.325	1.27E+04	2.425	8.28E+04
275	1.18E+06	1.375	2.85E+05	2.475	1.09E+02
325	2.11E+04	1.425	2.05E+05	2.525	3.13E+02
375	1.94E+05	1.475	4.28E+03	2.575	2.08E+01
425	1.62E+04	1.525	1.57E+05	2.625	7.11E+01
475	7.57E+04	1.575	7.01E+04	2.675	1.88E+03
525	2.34E+04	1.625	9.90E+02	2.725	9.38E+01
575	2.52E+04	1.675	7.73E+04	2.775	1.67E+03
625	2.44E+05	1.725	1.62E+05	2.825	1.30E+02
675	9.19E+04	1.775	8.47E+05	2.875	8.47E+02
725	5.81E+04	1.825	1.34E+05	2.925	1.02E+03
775	3.48E+05	1.875	2.94E+04	2.975	1.31E+03
825	1.14E+05	1.925	2.71E+03	3.025	0.00E+00
875	0.00E+00	1.975	2.87E+02	3.075	1.45E+03
925	1.76E+05	2.025	3.77E+03	3.125	1.02E+02
975	0.00E+00	2.075	7.21E+03	3.175	1.05E+02
1,025	0.00E+00	2.125	6.95E+04	3.225	1.04E+01
1,075	0.00E+00	2.175	3.44E+03	3.275	5.23E+00
				3.325	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	2.86E+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	5.95E+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	7.45E+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	5.04E+03	1,625	6.96E+01
275	7.52E+02	975	1.14E+03	1,675	2.53E+02
325	1.95E+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	5.13E+10	925	8.38E+03	1.825	9.22E+02
75	1.29E+08	975	1.70E+03	1.875	0.00E+00
125	5.37E+05	1.025	7.79E+03	1.925	0.00E+00
175	4.41E+06	1.075	6.17E+03	1.975	0.00E+00
225	4.31E+05	1.125	1.36E-08	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	5.47E+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	6.45E+04	1.425	0.00E+00	2.325	0.00E+00
575	1.24E+04	1.475	0.00E+00	2.375	0.00E+00
625	3.29E+02	1.525	2.54E+03	2.425	0.00E+00
675	1.31E+03	1.575	0.00E+00	2.475	0.00E+00
725	9.15E+04	1.625	1.14E+04	2.525	0.00E+00
775	1.91E+05	1.675	6.16E+02	2.575	0.00E+00
825	5.92E+03	1.725	5.63E+00	2.625	2.93E+05
875	5.39E+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 $t = 0$)**

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 the alpha decay particles 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 since it is in most cases impossible to reliably know the plutonium chemical compounds existing in a given waste container sufficient to calculate a neutron source term. For this reason an alternate method has been devised with the intent of providing some bounds on the expected neutron source term. The method and results presented in this section are based on work by East (1994).²⁻⁵

The method is based on the evaluation of a database containing neutron measurement data on approximately 12,000 drums of RFP-generated waste acquired at the SWEPP waste examination 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 since 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.

2.4.1 Calculational Method

To support the calculational method, discussion is required on the origin of neutrons emitted from TRU waste. Additionally, estimates are made of the various radionuclidic and waste chemical forms such that neutron yields can be calculated.

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

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

For most TRU 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

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

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 (PuO_2) and four (PuF_4), respectively. The beryllium and boron values are based on thick target yields from Reference 2-6.

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 chemical 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 on the isotopic composition, but it also is highly dependent on the chemical form due to the vastly different (α ,n) yields of different elements. It also depends on 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 common isotopic compositions and chemical forms. 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 the 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.²⁻⁷ 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 as 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). Neutron yields²⁻⁶ 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 system was used to calculate actual average neutron emission rates for many of the retrievably-stored RFP waste categories.²⁻⁸

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

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

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. 50% of the thick target yields²⁻⁷ 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 emissions.

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

where

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

B_{avg} = Average background rate determined from approximately 100 background measurements (28.13 counts/sec)

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

Note that no matrix corrections (for neutron absorption, etc.) have been applied.

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:

- As declared by the waste generator (RFP)
- As determined by the SWEPP drum assay system in active mode
- As determined by the SWEPP drum assay 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 (content code) available in the sample set. The results are shown in Table 2-27 for each 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 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 SWEPP-derived mass values; the most notable exception is the sludge content code 4 for which an order-of-magnitude difference exists.

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

For RFP 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 .

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	Scarfed graphite chunks
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

2.5 References

- 2-1. 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.
- 2-2. 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.
- 2-3. Browne E. and R. B. Firestone, *Table of Radioactive Isotopes*, John Wiley & Sons, 1986.
- 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.
- 2-6. Anderson M. E. and J. F. Lemming, *Selected Measurement Data for Plutonium and Uranium*, Mound Laboratory report MLM-3009/ISPO-157, November 1982.
- 2-7. 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.
- 2-8. East, L. V., *SWEPP Passive-Active Neutron Assay Database Description*, EG&G Idaho RWMC-EDF-688, December 1993.
- 2-9. Becker, G. K., *Pink Drum Calibration and Verification Calculations for FTC-CF-Z284 Californium Source*, RWMC-EDF-547, May 1992.

3. INEL WASTE PROFILE SHEET FORMAT

The description of the contents and format of the INEL Waste Profile Sheets for TRUMWs and TRUWs is provided below. Each TRUMW 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 TRUW 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 Facilities 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 containers in storage. Values in this section of the Profile Sheets 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 Containers</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 Idaho Mixed Waste Inventory (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 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., TRUMW). EPA-defined contaminant 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 No.</i>	The hazardous waste number [as defined in Title 40 of the Code of Federal Regulations Part 268 (40 CFR 269)] 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 the presence of contaminants was in accordance with the current IMWI databases and supporting documentation used for compliance with 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, 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 for similar alpha low-level wastes. 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 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 of 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 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 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.

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.

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

c. 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.

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 Interval 0.

Since transuranic waste is by definition greater than or equal to 100 nCi/g, all waste described in this report is categorized in Intervals 1 through 34.

Also included in Section E of the Profile Sheets is a chart showing the alpha activity concentration distribution in terms of percent total gross mass. For example, the chart contained in Section E of the INEL Waste Profile Sheet ID-EGG-102T-2 shows that approximately 79% of the gross mass of the transuranic waste within this content code has a transuranic alpha activity concentration of

$$100 \text{ nCi/g} \leq \text{TRU alpha activity concentration} < 500 \text{ nCi/g}$$

whereas, approximately 21% has

$$1000 \text{ nCi/g} \leq \text{TRU alpha activity concentration} < 2000 \text{ nCi/g}$$

This information allows the reader to quickly compare the alpha activity concentration within content codes.

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

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).

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.

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.
<i>Alpha Activity Distribution</i>	Chart displaying alpha activity concentration in terms of total gross mass percent and interval number.

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" subreport. 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>Physical/Chemical Composition</i>	
<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 data reported.

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 estimation of chemical composition of the constituents defined in the profile sheets. Table 3-4 presents an additional detailed estimation of chemical composition based on the inert fraction of constituents listed in Table 3-2. Table 3-5 presents an additional detailed estimation of chemical composition based on 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 TRUMW and TRUW are required. Use of these base case data will reduce assumptions or other conclusions drawn from an incomplete data set for these waste types.

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

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 Na2O	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								Inert
	Carbon	Hydrogen	Oxygen	Nitrogen	Sulfur	Chlorine	Fluorine	Water	
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	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	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
Dirt/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 Na ₂ O	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
Surgeon's 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

An INEL Waste Profile Sheet with the INEL ID of "Design Basis" and Content Code designation of "TRUW" is provided in this report section. This design basis profile sheet provides a set of data and information considered "typical" of the INEL stored transuranic mixed waste and transuranic 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 concentration data to be applied to empty record cases is reasonable in terms of the actual characteristics of the INEL transuranic stored wastes.

The design case data presented in this report are based on a typical drum filled with a heterogenous waste mixture of combustibles and lead. Values are based on one 55-gallon drum weighing 175 lbs (79.4 kg) gross mass, 100 lbs (45.5 kg) waste mass. The source composition is comprised of a nominal WG Pu composition at 15 years post purification at a mass per container of 2.5 grams. In addition, the waste contains lead, which is a RCRA hazardous constituent. 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-288T-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 3-21. In this profile sheet, one EPA Hazardous Waste Code (lead) and associated data are provided. These data include an estimated concentration (mg/kg) and assumed maximum concentration (mg/kg).

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

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

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

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
Benelex/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
Surgeon's 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

in 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

$$200,000 \frac{\text{mg}}{\text{kg}} \times 6,240 \text{ kg} = 1.25\text{E}+09 \text{ mg (1,248 kg) lead} \quad (3-2)$$

Example 2: The INEL Waste Profile Sheet ID-EGG-114T-10 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-TRUW) on page 3-22. 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 (79.6 kg) and waste mass (45.5 kg).

To complete the waste characterization data in INEL Waste Profile Sheet ID-EGG-114T-10, the reader should use the design basis radionuclide mixture, Pu-52. To determine the mass of Pu-52 in ID-EGG-114T-10, the Pu Mix Mass/Gross Mass concentration in ID-EGG-114T-10 must be normalized to the respective Design Basis Case concentration, DES-BASIS-TRUW. This normalization and determination of the associated mass of Pu-52 in ID-EGG-114T-10 is done as follows:

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

$$\begin{aligned} \text{Design Basis Pu-52 concentration} \times \text{Gross Mass ID-EGG-114T-10} \\ = \text{Pu-52 mass in ID-EGG-114T-10} \end{aligned} \quad (3-4)$$

In this example,

$$\text{Design Basis Pu-52 concentration} = \frac{2.5 \text{ g Pu-52}}{79,800 \text{ g Gross Mass}} \quad (3-5)$$

$$\text{Design Basis Pu-52 concentration} = 3.14\text{E}-05 \frac{\text{g Pu-52}}{\text{g Gross Mass}} \quad (3-6)$$

$$\begin{aligned} 3.14\text{E}-05 \frac{\text{g Pu-52}}{\text{g Gross Mass}} \times 68,100,000 \text{ g Gross Mass} \\ = 2,138 \text{ g Pu-52 in ID-EGG-114T-10} \end{aligned} \quad (3-7)$$

Therefore the total alpha activity for ID-EGG-114T-10 would be estimated as 1.71E+11 nanoCuries by the following equation.

$$2,138 \text{ g Pu-52} \times 7.977\text{E-02} \frac{\text{Ci}}{\text{g Pu-52}} \times 1.0\text{E+09} \frac{\text{nCi}}{\text{Ci}} = 1.71\text{E+11 nCi TRU } \alpha \text{ activity} \quad (3-8)$$

To obtain the TRU alpha activity concentration, the TRU alpha activity computed above is divided by the gross mass in ID-EGG-114T-10 as shown below. The conversion factor used to convert Pu-52 mass to TRU alpha activity (in Ci) is found in Table 2-2.

$$\frac{1.71\text{E+11}}{68,100,000} \frac{\text{nCi TRU } \alpha \text{ activity}}{\text{g Gross Mass ID-EGG-114T-10}} = 2,511 \frac{\text{nCi}}{\text{g Gross Mass}} \quad (3-9)$$

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-287T-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-TRUW) on page 3-24. In this profile sheet, an estimated typical matrix composition for a mixture of heterogeneous combustibles and lead is presented.

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

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

$$721,588 \text{ kg Paper} = 40.0 \text{ Wt\%} \times 1,803,970 \text{ kg} \quad (3-11)$$

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

TRUMW

DES-BASIS-TRUW

A. IDENTIFICATION

INEL ID/Name: DES-BASIS

N/A

C. Code/Name: TRUW

Default Design Basis Information For Transuranic Waste (Mixed or Non-mixed)

B. DESCRIPTION

INEL ID (WMIS) Description:

N/A

Total Volume (m3): .21

Gross Mass (kg): 79.38

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

21-Mar-94

INEL Waste Profile Sheet

TRUMW DES-BASIS-TRUW

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	DM	0.21	79.38	
Subtotal 1		0.21	79.38	

Total 1	.21 m3	79.38 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	200.000	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)
4	2,000 <= nCi/g < 3,000	7.96E+01	4.55E+01
Totals		7.96E+01	4.55E+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.

Alpha Activity Distribution

21-Mar-94

INEL Waste Profile Sheet

TRUMW DES-BASIS-TRUW

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	2.50E+00	3.14E-05	2.51E+03	1.32E-01	2.51E+03	5.50E-05	4.39E+03	2.31E-01	4.39E+03

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTSPHYSICAL/CHEMICAL COMPOSITION

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)	20.0
		Other HVPM(Zn,Cd)	
	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		
	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		
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	40.0
		Wood	
		Cardboard	
		Cloth	

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

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. TRANSURANIC MIXED WASTE PROFILE SHEETS

A. IDENTIFICATION

INEL ID/Name: CH-ANL-177T LEAD SHIELD PLUGS, TRU

C. Code/Name: *

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

This waste stream consists of TRU-contaminated shield plugs in the ANL-771 Radioactive Scrap and Waste Facility (RWSF). Plugs are an integral part of waste containers stored at RSWF.

Total Volume (m3): .25

Gross Mass (kg): 2,862.50

Drum Equivalents: 1.18

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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

CH-ANL-177T-*

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
		0.25	2,862.50	
Subtotal		0.25	2,862.50	

Total**.25 m3****2,862.50 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		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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****PHYSICAL/CHEMICAL COMPOSITION**

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

Component	Conc.	Units of Conc.	Ref.
LEAD	50	% WT	4-4

AIM

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Silver Spring, Maryland 20910
301/587-8202

Centimeter

Inches

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BY APPLIED IMAGE, INC.

2 of 11

A. IDENTIFICATION

INEL ID/Name: CH-ANL-180T SODIUM - TRU

C. Code/Name: *

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

Sodium is used as a primary and secondary coolant for the EBR-II reactor. Waste sodium metal is a hazardous constituent of some of the TRU waste stored at the ANL-W Radioactive Scrap and Waste Facility (RSWF). The waste is generated during maintenance and operational activities. The sodium typically coats waste metal equipment, experiments and components removed during reactor operations and maintenance activities.

Total Volume (m3): .14

Gross Mass (kg): 126.10

Drum Equivalents: .66

Physical Form: SOLID

Physical Type: METAL, CONTAMINATED EQUIPMENT

PCBs: ☐

Combustibility:

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

Waste Type

☐ ALLW ☐ ALLMW ☐ TRUW ☒ TRUMW

Rad. Level

☐ Contact-Handled ☒ Remote-Handled

23-Mar-94

INEL Waste Profile Sheet

TRUMW

CH-ANL-180T-*

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
		0.14	126.10	
Subtotal		0.14	126.10	

Total**.14 m3****126.10 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)
D001	IGNITABLE	REACTIVES			
D003	REACTIVE	WATER REACTIVE			

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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**

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 PIECES, RODS, SODIUM)			4-4

A. IDENTIFICATION

INEL ID/Name: CH-ANL-182T SODIUM POTASSIUM -NaK- TRU

C. Code/Name: *

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

Sodium potassium alloy (NaK) is used as a coolant for some components of the EBR-II Reactor. Waste NaK metal is a hazardous constituent of some transuranic wastes stored at the ANL-W Radioactive Scrap and Waste Facility (RSWF). The remote-handled NaK waste at RSWF is contained in stainless steel capsules or tubing and placed inside carbon steel waste cans which then are placed in stainless steel outer cans. The entire package is then stored in RSWF storage liners (carbon steel soil storage vaults). The NaK is generated during maintenance and operational activities. NaK waste is in canisters with TRU waste metal pieces and rods from reactor experiments.

Total Volume (m3): .01

Gross Mass (kg): 5.00

Drum Equivalents: .03

Physical Form: SOLID

Physical Type: METAL, CONTAMINATED EQUIPMENT

PCBs: ☐

Combustibility:

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

Waste Type

☐ ALLW☐ ALLMW☐ TRUW☒ TRUMW

Rad. Level

☐ Contact-Handled☒ Remote-Handled

23-Mar-94

INEL Waste Profile Sheet

TRUMW

CH-ANL-182T-*

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
		0.01	5.00	
Subtotal		0.01	5.00	

Total**.01 m3****5.00 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	REACTIVES			
D003	REACTIVE	WATER REACTIVE			

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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**

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

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
METAL (PIECES AND RODS)			4-4
OTHER (NaK)			4-4

A. IDENTIFICATION

INEL ID/Name: CH-ANL-241T TRU-CD-HOT CELL WASTE

C. Code/Name: *

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

This waste stream consists of metallic cadmium, salts, and associated cleanup materials (paper towels and cloth rags). The waste is contaminated with activation and fission products as well as with plutonium. This waste stream is generated for Integral Fast Reactor /Fuel Cycle Facility Demonstration support experiments. Because this waste is currently stored in a satellite accumulation area, and not in a RCRA-permitted storage area, it is assumed that the volume is less than 55 gallons (0.2 cubic meters).

Total Volume (m3): .20

Gross Mass (kg):

Drum Equivalents: .94

Physical Form: SOLID

Physical Type: METAL, PAPER, RAGS, OTHER

PCBs: ☐

Combustibility:

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

Waste Type

☐ ALLW ☐ ALLMW ☐ TRUW ☒ TRUMW

Rad. Level

☐ Contact-Handled ☒ Remote-Handled

23-Mar-94

INEL Waste Profile Sheet

TRUMW

CH-ANL-241T-*

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
		0.20		
Subtotal		0.20		

Total	.20 m3	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)
D006	CADMIUM		7440-43-9		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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**

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

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
OTHER (CADMIUM SALTS)			4-4
PAPER			4-4
RAGS			4-4

A. IDENTIFICATION

INEL ID/Name: CH-ANL-243T ELEMENT HARDWARE FCF WASTE

C. Code/Name: *

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

This waste stream consists of metal ends of EBR-II fuel elements. This waste stream will be generated from the "Element Chopper" station in the ANL-W Fuel Cycled Facility Integral Fast Reactor Demonstration.

Total Volume (m3): .00

Gross Mass (kg): .00

Drum Equivalents: .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

C. STORAGE

Total	.00 m3	.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)
D005	BARIUM		7440-39-3		
D006	CADMIUM		7440-43-9		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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**

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

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
BARIUM	3000	PPM	4-4
CADMIUM	3000	PPM	4-4

A. IDENTIFICATION

INEL ID/Name: CH-ANL-245T ELECTROREFINER STRIPPER CADMIUM

C. Code/Name: *

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

This waste stream consists of waste cadmium metal. This waste stream will be generated from the Electrorefiner station in the ANL-W Fuel Cycled Facility Integral Fast Reactor Demonstration.

Total Volume (m3): .00

Gross Mass (kg): .00

Drum Equivalents: .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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

CH-ANL-245T-*

C. STORAGE

Total	.00 m3	.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)
D006	CADMIUM		7440-43-9		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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**

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

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
CADMIUM	99	% WT	4-4

A. IDENTIFICATIONINEL ID/Name: **CH-ANL-246T** ELECTROREFINER INSOLUBLES W/CADMIUM

C. Code/Name: *

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

This waste stream consists of cadmium metal with other heavy metals & "noble" metals (they are not reactive in the FCF electrorefining process). This waste stream will be generated from the Electrorefiner station in the ANL-W Fuel Cycle Facility Fast Reactor Demonstration. This waste stream includes inorganic sludges/particulates.

Total Volume (m3): .00

Gross Mass (kg): .00

Drum Equivalents: .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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

CH-ANL-246T-*

C. STORAGE

Total	.00 m3	.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)
D006	CADMIUM		7440-43-9		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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**

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

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
CADMIUM	57	% WT	4-4
HEAVY METALS	2	% WT	4-4
METALS (NOBLE - MOSTLY ZIRCONIUM)	41	% WT	4-4

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102T UNCEMENTED INORGANIC SLUDGE (TRU)

C. Code/Name: 1 FIRST STAGE SLUDGE

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

Miscellaneous inorganic setups.

Total Volume (m3): 2,531.01

Gross Mass (kg): 2,580,959.17

Drum Equivalents: 11,938.72

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 (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 (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 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 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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-102T-1

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
11849	DRUM	2,511.99	2,570,859.17	FIRST STAGE SLUDGE
6	BOX	19.02	10,100.00	FIRST STAGE SLUDGE
Subtotal	11855	2,531.01	2,580,959.17	

Total 11,855**2,531.01 m3****2,580,959.17 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)
D002	CORROSIVE	ACID			
D005	BARIUM	.	7440-39-3		
D006	CADMIUM	.	7440-43-9		
D007	CHROMIUM	.	7440-47-32		
D008	LEAD	.	7439-92-1		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		
D011	SILVER	.	7440-22-4		
D022	CHLOROFORM	.	67-66-3		
D028	1,2-DICHLOROETHANE	.	107-06-2		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		
P015	BERYLLIUM DUST	.	7440-41-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	3.30E+04	3.00E+04
2	500 <= nCi/g < 1,000	2.20E+04	1.90E+04
3	1,000 <= nCi/g < 2,000	5.20E+04	4.70E+04
4	2,000 <= nCi/g < 3,000	5.10E+04	4.50E+04
5	3,000 <= nCi/g < 4,000	6.10E+04	5.40E+04
6	4,000 <= nCi/g < 5,000	4.70E+04	4.20E+04
7	5,000 <= nCi/g < 6,000	5.40E+04	4.80E+04
8	6,000 <= nCi/g < 7,000	5.10E+04	4.50E+04
9	7,000 <= nCi/g < 8,000	6.00E+04	5.40E+04
10	8,000 <= nCi/g < 9,000	6.30E+04	5.70E+04
11	9,000 <= nCi/g < 10,000	5.70E+04	5.10E+04
12	10,000 <= nCi/g < 20,000	7.50E+05	6.70E+05
13	20,000 <= nCi/g < 30,000	6.00E+05	5.40E+05
14	30,000 <= nCi/g < 40,000	3.00E+05	2.70E+05
15	40,000 <= nCi/g < 50,000	1.70E+05	1.60E+05
16	50,000 <= nCi/g < 60,000	9.60E+04	8.50E+04
17	60,000 <= nCi/g < 70,000	5.30E+04	4.70E+04
18	70,000 <= nCi/g < 80,000	3.00E+04	2.60E+04
19	80,000 <= nCi/g < 90,000	1.70E+04	1.40E+04
20	90,000 <= nCi/g < 100,000	1.10E+04	9.10E+03
21	100,000 <= nCi/g < 200,000	4.10E+04	3.30E+04
22	200,000 <= nCi/g < 300,000	3.90E+03	3.20E+03
23	300,000 <= nCi/g < 400,000	3.20E+03	2.70E+03
24	400,000 <= nCi/g < 500,000	6.40E+02	5.40E+02
25	500,000 <= nCi/g < 600,000	6.30E+02	5.40E+02
Totals		2.63E+06	2.35E+06

Alpha Activity Distribution

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	1.93E+04	6.61E-04	2.21E+06	3.96E-04	2.21E+06	7.76E-04	2.60E+06	4.65E-04	2.60E+06
PU-52	5.05E+04	6.04E-04	4.81E+04	2.53E+00	4.81E+04	7.00E-04	5.59E+04	2.94E+00	5.59E+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	
		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-dri	0.5
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
Inorganic Sludge -		Sludge High Na ₂ O (1st Stage)	46.5
		Sludge High CaO (2nd Stage)	46.5
<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	0.9
		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 (OIL-DR)			4-1
ABSORBENT (PORTLAND CEMENT)	50	LBS/DRUM	4-1
ABSORBENT (VERMICULITE)			4-1
BERYLLIUM	1000	PPM	4-1
ORGANICS	14	LB/FT ³	4-1, 2
SLUDGE			4-1, 2
WATER	50-70	% WT	4-1

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-102T-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102T UNCEMENTED INORGANIC SLUDGE (TRU)

C. Code/Name: 2 SECOND STAGE SLUDGE

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

Miscellaneous inorganic setups.

Total Volume (m3): 1,296.80

Gross Mass (kg): 1,402,000.09

Drum Equivalents: 6,117.00

Physical Form: SOLID

Physical Type: SLUDGE, GLASS, 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 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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-102T-2

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	6117	DRUM	1,296.80	1,402,000.09	SECOND STAGE SLUDGE
Subtotal	6117		1,296.80	1,402,000.09	

Total 6,117**1,296.80 m3****1,402,000.09 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			
D003	REACTIVE	OTHER REACTIVES			
D005	BARIUM	.	7440-39-3		
D006	CADMIUM	.	7440-43-9		
D007	CHROMIUM	.	7440-47-32		
D008	LEAD	.	7439-92-1		
D009	MERCURY	ELEMENTAL MERCURY CONTAMINATED WITH RADIOACTIVE MATERIALS	7439-97-6		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		
D011	SILVER	.	7440-22-4		
D022	CHLOROFORM	.	67-66-3		
D028	1,2-DICHLOROETHANE	.	107-06-2		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		
P015	BERYLLIUM DUST	.	7440-41-7		

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INEL Waste Profile Sheet

TRUMW

ID-EGG-102T-2

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	6.90E+05	6.20E+05
3	1,000 <= nCi/g < 2,000	1.80E+05	1.60E+05
4	2,000 <= nCi/g < 3,000	5.50E+02	4.80E+02
12	10,000 <= nCi/g < 20,000	1.40E+03	1.20E+03
13	20,000 <= nCi/g < 30,000	1.80E+02	1.60E+02
Totals		8.72E+05	7.82E+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.

Alpha Activity Distribution

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INEL Waste Profile Sheet

TRUMW

ID-EGG-102T-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)
AM-241	8.67E+01	1.26E-05	4.23E+04	7.58E-06	4.23E+04	1.44E-05	4.82E+04	8.64E-06	4.82E+04
PU-52	1.26E+03	1.21E-05	9.65E+02	5.07E-02	9.65E+02	1.37E-05	1.09E+03	5.75E-02	1.09E+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		
		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 Na2O (1st Stage)		
Sludge High CaO (2nd Stage)		91.9		
Aqueous Solutions		3.8		
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber		
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelex/lead		
		Sheetrock		
		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)			4-1, 2
METAL (ELECTRIC MOTORS)			4-1, 2
ORGANICS	14	LB/FT3	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

TRUMW

ID-EGG-102T-2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102T UNCEMENTED INORGANIC SLUDGE (TRU)

C. Code/Name: 7 BLDG 374 DRY SLUDGE

B. DESCRIPTION

INEL ID (WMIS) Description:

Miscellaneous inorganic setups.

Total Volume (m3): 459.19

Gross Mass (kg): 482,470.03

Drum Equivalents: 2,166.00

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:**

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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-102T-7

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
2166	DRUM	459.19	482,470.03	BLDG 374 DRY SLUDGE
Subtotal	2166	459.19	482,470.03	

Total 2,166**459.19 m3****482,470.03 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			
D006	CADMIUM		7440-43-9		
D007	CHROMIUM		7440-47-32		
D008	LEAD		7439-92-1		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		
D022	CHLOROFORM		67-66-3		
D028	1,2-DICHLOROETHANE		107-06-2		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		
P015	BERYLLIUM DUST		7440-41-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.80E+05	1.60E+05
2	500 <= nCi/g < 1,000	4.70E+05	4.20E+05
3	1,000 <= nCi/g < 2,000	4.80E+04	4.30E+04
4	2,000 <= nCi/g < 3,000	2.10E+04	1.90E+04
5	3,000 <= nCi/g < 4,000	1.90E+03	1.70E+03
6	4,000 <= nCi/g < 5,000	1.60E+04	1.50E+04
7	5,000 <= nCi/g < 6,000	1.20E+04	1.10E+04
8	6,000 <= nCi/g < 7,000	1.20E+03	1.10E+03
11	8,000 <= nCi/g < 10,000	2.60E+02	2.40E+02
12	10,000 <= nCi/g < 20,000	3.50E+03	3.10E+03
14	30,000 <= nCi/g < 40,000	1.20E+02	9.70E+01
15	40,000 <= nCi/g < 50,000	1.50E+02	1.30E+02
Totals		7.54E+05	6.74E+05

Alpha Activity Distribution

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 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	1.61E+02	2.68E-05	8.97E+04	1.61E-05	8.97E+04	3.07E-05	1.03E+05	1.84E-05	1.03E+05
PU-52	1.92E+03	4.87E-04	3.88E+04	2.04E+00	3.88E+04	5.92E-04	4.72E+04	2.48E+00	4.72E+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	
		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	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	42.3
		Sludge High CaO (2nd Stage)	42.3
		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	1.1
		Polyvinyl Chloride (PVC)	0.3
		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.
SLUDGE			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102T UNCEMENTED INORGANIC SLUDGE (TRU)

C. Code/Name: 30 SOLIDIFIED GRINDING SLUDGE, ETC.

B. DESCRIPTION

INEL ID (WMIS) Description:

Miscellaneous inorganic setups.

Total Volume (m3): 9.54

Gross Mass (kg): 4,900.00

Drum Equivalents: 45.00

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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-102T-30

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	45	DRUM	9.54	4,900.00	SOLIDIFIED GRINDING SLUDGE, ETC.
Subtotal	45		9.54	4,900.00	

Total 45**9.54 m3****4,900.00 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		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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	7.0
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
	Misc. Non-Combustible -	Other HVPM(Zn,Cd)	0.0
		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)		37.0	
Sludge High CaO (2nd Stage)		37.0	
<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	5.6
		Polyvinyl Chloride (PVC)	1.4
<u>Combustibles</u> (>90% Combustible)		Teflon	0.0
	Plexiglass		
		Rubber -	
	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/FT3	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-102T UNCEMENTED INORGANIC SLUDGE (TRU)
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): 553.53

Gross Mass (kg): 535,400.04

Drum Equivalents: 2,611.00

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 (for WIPP) 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. Hazardous materials expected in the stream include cadmium (EP Toxic, Waste Code D006) and lead (EP Toxic, Waste code D008).

The certified 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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-102T-111

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	2611	DRUM	553.53	535,400.04	WIPP PRECERTIFIED RGW NONCOMPACTIBLE SOLIDS OR CERT
Subtotal	2611		553.53	535,400.04	

Total 2,611**553.53 m3****535,400.04 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			
D004	ARSENIC	.	7440-38-2		
D005	BARIUM	.	7440-39-3		
D006	CADMIUM	.	7440-43-9		
D007	CHROMIUM	.	7440-47-32		
D008	LEAD	.	7439-92-1		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	ETHYL BENZENE	100-41-4		
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		
P015	BERYLLIUM DUST	.	7440-41-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.60E+05	1.30E+05
2	500 <= nCi/g < 1,000	2.90E+05	2.50E+05
3	1,000 <= nCi/g < 2,000	2.20E+04	1.90E+04
4	2,000 <= nCi/g < 3,000	1.80E+04	1.50E+04
5	3,000 <= nCi/g < 4,000	1.60E+04	1.40E+04
6	4,000 <= nCi/g < 5,000	1.70E+04	1.50E+04
7	5,000 <= nCi/g < 6,000	1.20E+04	1.00E+04
8	6,000 <= nCi/g < 7,000	1.80E+04	1.50E+04
9	7,000 <= nCi/g < 8,000	1.70E+04	1.50E+04
10	8,000 <= nCi/g < 9,000	1.60E+04	1.30E+04
11	9,000 <= nCi/g < 10,000	1.20E+04	9.90E+03
12	10,000 <= nCi/g < 20,000	9.90E+04	8.40E+04
13	20,000 <= nCi/g < 30,000	5.80E+04	4.90E+04
14	30,000 <= nCi/g < 40,000	2.30E+04	1.90E+04
15	40,000 <= nCi/g < 50,000	1.50E+04	1.20E+04
16	50,000 <= nCi/g < 60,000	4.30E+03	3.60E+03
17	60,000 <= nCi/g < 70,000	8.40E+02	7.30E+02
19	80,000 <= nCi/g < 90,000	1.60E+02	1.30E+02
21	100,000 <= nCi/g < 200,000	7.30E+01	5.00E+01
22	200,000 <= nCi/g < 300,000	1.20E+02	7.50E+01
Totals		7.98E+05	6.74E+05

Alpha Activity Distribution

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	1.46E+03	8.34E-05	2.79E+05	5.00E-05	2.79E+05	9.91E-05	3.31E+05	5.94E-05	3.31E+05
PU-239	6.05E+02	5.30E-03	3.29E+05	4.40E-03	3.29E+05	7.85E-03	4.87E+05	6.50E-03	4.87E+05
PU-241	4.30E-02	6.52E-07	1.13E+03	7.86E-01	1.13E+03	9.93E-07	1.73E+03	1.20E+00	1.73E+03
PU-240	2.23E+01	1.86E-04	4.21E+04	1.91E-02	4.21E+04	2.99E-04	6.77E+04	3.08E-02	6.77E+04
PU-52	8.55E+03	1.32E-03	1.05E+05	5.53E+00	1.05E+05	1.61E-03	1.29E+05	6.76E+00	1.29E+05
U-233	3.60E+01	5.46E-04	0.00E+00	5.28E+03	5.28E+03	8.31E-04	0.00E+00	8.04E+03	8.04E+03
U-235	1.46E+01	9.02E-06	0.00E+00	1.73E-02	1.73E-02	1.06E-05	0.00E+00	2.03E-02	2.03E-02

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)			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

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INEL Waste Profile Sheet

TRUMW

ID-EGG-102T-113

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102T UNCEMENTED INORGANIC SLUDGE (TRU)

C. Code/Name: 113 CERTIFIED SOLID LAB WASTE

B. DESCRIPTION

INEL ID (WMIS) Description:
Miscellaneous inorganic setups.

Total Volume (m3): 14.42

Gross Mass (kg): 19,680.00

Drum Equivalents: 68.00

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

Content Code Description:

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

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
68	DRUM	14.42	19,680.00	CERTIFIED SOLID LAB WASTE
Subtotal 68		14.42	19,680.00	

Total 68	14.42 m3	19,680.00 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 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			
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.40E+03	1.20E+03
2	500 <= nCi/g < 1,000	3.40E+03	3.10E+03
3	1,000 <= nCi/g < 2,000	8.20E+03	7.40E+03
4	2,000 <= nCi/g < 3,000	4.80E+03	4.30E+03
5	3,000 <= nCi/g < 4,000	1.20E+03	1.10E+03
6	4,000 <= nCi/g < 5,000	3.00E+02	2.70E+02
7	5,000 <= nCi/g < 6,000	2.80E+02	2.50E+02

Totals

1.96E+04 1.76E+04

Alpha Activity Distribution

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	4.36E+02	2.38E-04	1.90E+04	9.97E-01	1.90E+04	2.65E-04	2.12E+04	1.11E+00	2.12E+04
U-235	7.40E+01	2.74E-04	0.00E+00	5.27E-01	5.27E-01	3.09E-04	0.00E+00	5.94E-01	5.94E-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.
ABSORBENT	90	LBS/BOX	4-1
SLUDGE (SEWAGE SLUDGE)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102T UNCEMENTED INORGANIC SLUDGE (TRU)

C. Code/Name: 292 CEMENTED SLUDGE

B. DESCRIPTIONINEL ID (WMIS) Description:
Miscellaneous inorganic setups.

Total Volume (m3): 110.45

Gross Mass (kg): 66,024.00

Drum Equivalents: 521.00

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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-102T-292

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	521	DRUM	110.45	66,024.00	CEMENTED SLUDGE
Subtotal	521		110.45	66,024.00	

Total 521**110.45 m3****66,024.00 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			
D006	CADMIUM		7440-43-9		
D008	LEAD		7439-92-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	4.00E+02	3.60E+02
2	500 <= nCi/g < 1,000	6.10E+02	5.00E+02
3	1,000 <= nCi/g < 2,000	4.20E+03	3.50E+03
4	2,000 <= nCi/g < 3,000	4.30E+03	3.50E+03
5	3,000 <= nCi/g < 4,000	3.10E+03	2.50E+03
6	4,000 <= nCi/g < 5,000	2.80E+03	2.20E+03
7	5,000 <= nCi/g < 6,000	4.60E+03	3.70E+03
8	6,000 <= nCi/g < 7,000	2.90E+03	2.30E+03
9	7,000 <= nCi/g < 8,000	3.20E+03	2.60E+03
10	8,000 <= nCi/g < 9,000	2.40E+03	2.00E+03
11	9,000 <= nCi/g < 10,000	2.00E+03	1.60E+03
12	10,000 <= nCi/g < 20,000	1.20E+04	9.70E+03
13	20,000 <= nCi/g < 30,000	8.10E+03	6.60E+03
14	30,000 <= nCi/g < 40,000	5.10E+03	4.10E+03
15	40,000 <= nCi/g < 50,000	4.30E+03	3.40E+03
16	50,000 <= nCi/g < 60,000	1.40E+03	1.10E+03
17	60,000 <= nCi/g < 70,000	1.80E+03	1.50E+03
18	70,000 <= nCi/g < 80,000	9.00E+02	7.20E+02
19	80,000 <= nCi/g < 90,000	4.40E+02	3.50E+02
20	90,000 <= nCi/g < 100,000	4.00E+02	3.10E+02
21	100,000 <= nCi/g < 200,000	7.30E+02	5.50E+02
Totals		6.57E+04	5.31E+04

Alpha Activity Distribution

1. The TRU alpha activity concentration reported in this section consists of alpha-emitting transuranic 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	4.34E-01	4.21E-07	1.41E+03	2.53E-07	1.41E+03	5.17E-07	1.73E+03	3.10E-07	1.73E+03
PU-52	1.66E+04	8.41E-03	6.71E+05	3.53E+01	6.71E+05	1.07E-02	8.54E+05	4.49E+01	8.54E+05

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
		Ceramic (molds)	
	Misc. Non-Combustible -	Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	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	
		Leaded Rubber	
	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/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-DRI)			4-1
ABSORBENT (PORTLAND CEMENT)			4-1, 2
ABSORBENT (VERMICULITE)			4-1
ORGANICS	14	LB/FT3	4-1
RUBBER (SURGICAL GLOVES)			4-1, 2
SLUDGE			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102T

UNCEMENTED INORGANIC SLUDGE (TRU)

C. Code/Name: 811

EVAPORATOR AND DISSOLVER SLUDGE

B. DESCRIPTION

INEL ID (WMIS) Description:

Miscellaneous inorganic setups.

Total Volume (m3): .85

Gross Mass (kg): 300.00

Drum Equivalents: 4.00

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 Mound Laboratory, consists of dry evaporator and dissolver sludge and insoluble residue. The consistency ranges from powder to sand-like particles. Limited amounts of other noncombustible wastes including content codes 803, 805, 810, 813, 814, 826, and 832 may be included. A few containers may have limited amounts of beryllium-contaminated wastes including glass, paper, gloves and sample precipitates.

The waste is considered uncertifiable (for WIPP) due to the potential for and lack of information on fines. In addition the drums may be uncertifiable because the containers contain free liquids. Gas generation potential is minimal, because the expected organic content in the drums is less than 14lb/ft³. No explosive, pyrophoric, or corrosive materials should be in the waste.

After removal from the bottom of dissolver pots, the dried sludge is rinsed with nitric acid and dried on a hotplate. Dried sludges are packaged in 1/2-gallon metal cans and then sealed in a PE bag, or else packed in 1/2-gallon plastic-coated cardboard cartons, and then sealed in a PE bag. Each container is assayed and placed in PVC or PE sleeve bags. Sleeve bags can hold up to 5 containers per bag. Up to 8 sleeve bags are placed in each prepared 55-gallon drum. Drums are prepared according to post-1972 procedures, with plywood spacers as needed between on top of the rigid drum liner lid.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-102T-811

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	4	DRUM	0.85	300.00	EVAPORATOR AND DISSOLVER SLUDGE
Subtotal	4		0.85	300.00	

Total 4**.85 m3****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)
D001	IGNITABLE	OXIDIZERS			
D009	MERCURY	ELEMENTAL MERCURY CONTAMINATED WITH RADIOACTIVE MATERIALS	7439-97-6		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		
P015	BERYLLIUM DUST		7440-41-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
27	700,000 <= nCi/g < 800,000	7.40E+01	5.10E+01
29	900,000 <= nCi/g < 1,000,000	7.10E+01	4.80E+01
31	2,500,000 <= nCi/g < 5,000,000	1.60E+02	1.10E+02
Totals		3.05E+02	2.09E+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	8.00E+01	6.53E-04	4.05E+04	5.42E-04	4.05E+04	9.30E-04	5.77E+04	7.71E-04	5.77E+04
PU-238	3.90E+01	3.08E-04	4.68E+06	2.26E+02	4.68E+06	4.38E-04	6.65E+06	3.21E+02	6.65E+06

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	12.0
		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	
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	36.5
		Sludge High CaO (2nd Stage)	36.5
		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	4.8
		Polyvinyl Chloride (PVC)	1.2
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	9.0
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
BERYLLIUM			4-1
CLOTHING (GLOVES)			4-1
GLASS			4-1
METAL (METAL CANS)			4-1
ORGANICS	14	LB/FT ³	4-1
PAPER			4-1
PLASTIC (PVC BAGS)			4-1
SLUDGE (DRY EVAPORATOR AND DISSOLVER SLUDGE)			4-1

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-102T-980

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102T UNCEMENTED INORGANIC SLUDGE (TRU)

C. Code/Name: 980 EQUIPMENT

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

Miscellaneous inorganic setups.

Total Volume (m3): .21

Gross Mass (kg): 81.00

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:**

The information for this code is unclear, except that the waste stream consists of only one (1) drum, and was generated at the Rocky Flats Plant in 1973.

The waste stream is not certifiable (for WIPP) without more information. Assay records indicate that the drum contains Content Code 290 sludge, and that the sludge may be in a single bottle. It is assumed that drum preparation, packaging, and inspection was done according to post-1972 procedures.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-102T-980

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	DRUM	0.21	81.00	EQUIPMENT
Subtotal	1	0.21	81.00	

Total 1**.21 m3****81.00 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		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
12	10,000 <= nCi/g < 20,000	8.10E+01	5.80E+01
Totals		8.10E+01	5.80E+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.

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-52	1.10E+01	1.36E-04	1.08E+04	5.70E-01	1.08E+04	1.89E-04	1.51E+04	7.91E-01	1.51E+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	
		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	10.0
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (1st Stage)	40.0
		Sludge High CaO (2nd Stage)	40.0
		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	8.0
		Polyvinyl Chloride (PVC)	2.0
		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.
SLUDGE			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-109T BENELEX, PLEXIGLASS (TRU)

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): 22.20

Gross Mass (kg): 13,464.00

Drum Equivalents: 104.72

Physical Form: SOLID

Physical Type: METAL, OTHER, PLASTIC, RUBBER.

FCBs: ☐

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.

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

TRUMW

ID-EGG-109T-302

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
15	DRUM	3.18	1,564.00	BENELEX AND PLEXIGLASS
6	BOX	19.02	11,900.00	BENELEX AND PLEXIGLASS
Subtotal	21	22.20	13,464.00	

Total 21**22.20 m3****13,464.00 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		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.20E+04	1.00E+04
2	500 <= nCi/g < 1,000	4.20E+02	3.60E+02
3	1,000 <= nCi/g < 2,000	3.80E+02	2.90E+02
4	2,000 <= nCi/g < 3,000	4.00E+02	3.10E+02
5	3,000 <= nCi/g < 4,000	2.10E+02	1.70E+02
7	5,000 <= nCi/g < 6,000	8.60E+01	6.30E+01
12	10,000 <= nCi/g < 20,000	7.80E+01	5.50E+01
Totals		1.36E+04	1.12E+04

Alpha Activity Distribution

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	2.56E-02	1.96E-07	6.57E+02	1.18E-07	6.57E+02	2.66E-07	8.91E+02	1.60E-07	8.91E+02
PU-52	9.20E+01	3.21E-04	2.56E+04	1.35E+00	2.56E+04	4.36E-04	3.48E+04	1.83E+00	3.48E+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	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)	
		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 Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	71.9
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	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.
OTHER (BENELEX)			4-1
PLASTIC (PLEXIGLASS)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-109T BENELEX, PLEXIGLASS (TRU)

C. Code/Name: 464 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): 6.15

Gross Mass (kg): 3,310.00

Drum Equivalents: 29.00

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

TRUMW

ID-EGG-109T-464

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	29	DRUM	6.15	3,310.00	BENELEX AND PLEXIGLASS
Subtotal	29		6.15	3,310.00	

Total 29**6.15 m3****3,310.00 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		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
2	500 <= nCi/g < 1,000	9.60E+02	7.50E+02
3	1,000 <= nCi/g < 2,000	5.80E+02	4.40E+02
4	2,000 <= nCi/g < 3,000	1.10E+03	8.50E+02
5	3,000 <= nCi/g < 4,000	4.00E+02	3.10E+02
6	4,000 <= nCi/g < 5,000	2.00E+02	1.50E+02
7	5,000 <= nCi/g < 6,000	1.30E+02	1.10E+02
Totals		3.37E+03	2.61E+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.

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-52	8.90E+01	2.30E-04	1.83E+04	9.63E-01	1.83E+04	2.90E-04	2.31E+04	1.22E+00	2.31E+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	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 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	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.
METAL (METAL HINGES, ANGLE IRON)			4-1
OTHER (BENELEX)			4-1, 2
PLASTIC (PLEXIGLASS)			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-112T CEMENTED SLUDGES (TRU)

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): 226.83

Gross Mass (kg): 286,980.02

Drum Equivalents: 1,069.95

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

TRUMW

ID-EGG-112T-4

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1055	DRUM	223.66	285,280.02	SPECIAL SET UPS (CEMENT)
1	BOX	3.17	1,700.00	SPECIAL SET UPS (CEMENT)
Subtotal	1056	226.83	286,980.02	

Total	1,056	226.83 m3	286,980.02 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			
D005	CADMIUM		7440-43-9		
D008	LEAD		7439-92-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.30E+05	1.20E+05
2	500 <= nCi/g < 1,000	6.80E+04	6.20E+04
3	1,000 <= nCi/g < 2,000	4.60E+04	4.20E+04
4	2,000 <= nCi/g < 3,000	1.10E+04	9.80E+03
5	3,000 <= nCi/g < 4,000	1.00E+03	9.10E+02
6	4,000 <= nCi/g < 5,000	7.80E+02	7.00E+02
7	5,000 <= nCi/g < 6,000	3.20E+02	2.70E+02
8	6,000 <= nCi/g < 7,000	2.60E+02	2.30E+02
12	10,000 <= nCi/g < 20,000	1.60E+03	1.50E+03
13	20,000 <= nCi/g < 30,000	3.30E+02	2.90E+02
17	60,000 <= nCi/g < 70,000	7.40E+02	6.50E+02
18	70,000 <= nCi/g < 80,000	1.70E+02	1.50E+02
21	100,000 <= nCi/g < 200,000	9.20E+01	6.90E+01
Totals		2.60E+05	2.39E+05

Alpha Activity Distribution

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	9.19E+00	1.10E-05	3.69E+04	6.62E-06	3.69E+04	1.20E-05	4.02E+04	7.20E-06	4.02E+04
PU-52	3.24E+03	3.84E-03	3.07E+05	1.61E+01	3.07E+05	4.71E-03	3.76E+05	1.98E+01	3.76E+05

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-dri	1.1		
		Vermiculite	0.2		
		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	0.7
				Polyvinyl Chloride (PVC)	0.2
Tellon	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

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INEL Waste Profile Sheet

TRUMW

ID-EGG-112T-112

A. IDENTIFICATION

INEL ID/Name: ID-EGG-112T CEMENTED SLUDGES (TRU)

C. Code/Name: 112 CERTIFIED 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): 164.09

Gross Mass (kg): 191,620.01

Drum Equivalents: 774.00

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:**

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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-112T-112

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	774	DRUM	164.09	191,620.01	CERTIFIED SOLID ORGANICS
Subtotal	774		164.09	191,620.01	

Total 774**164.09 m3****191,620.01 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)
D022	CHLOROFORM		67-66-3		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	5.80E+04	5.10E+04
2	500 <= nCi/g < 1,000	8.90E+04	7.90E+04
3	1,000 <= nCi/g < 2,000	4.10E+04	3.60E+04
4	2,000 <= nCi/g < 3,000	2.20E+02	1.90E+02
5	3,000 <= nCi/g < 4,000	2.40E+02	2.10E+02
6	4,000 <= nCi/g < 5,000	2.40E+02	2.10E+02
7	5,000 <= nCi/g < 6,000	2.60E+02	2.30E+02
9	7,000 <= nCi/g < 8,000	2.60E+02	2.30E+02
10	8,000 <= nCi/g < 9,000	2.30E+02	2.00E+02
11	9,000 <= nCi/g < 10,000	5.00E+02	4.40E+02
12	10,000 <= nCi/g < 20,000	2.00E+03	1.70E+03
13	20,000 <= nCi/g < 30,000	7.50E+02	6.60E+02
Totals		1.93E+05	1.70E+05

Alpha Activity Distribution

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

TRUMW

ID-EGG-112T-112

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	2.00E+00	5.26E-06	1.76E+04	3.16E-06	1.76E+04	6.27E-06	2.10E+04	3.76E-06	2.10E+04
PU-52	2.40E+03	1.01E-03	8.03E+04	4.22E+00	8.03E+04	1.15E-03	9.18E+04	4.83E+00	9.18E+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.
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 (UNKNOWN)			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-112T

CEMENTED SLUDGES (TRU)

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): 70.81

Gross Mass (kg): 58,400.00

Drum Equivalents: 334.00

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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-112T-114

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	334	DRUM	70.81	58,400.00	CERTIFIED SOLID INORGANIC PROCESS SOLUTION
Subtotal	334		70.81	58,400.00	

Total 334**70.81 m3****58,400.00 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		7439-92-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-112T-114

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)
1	100 <= nCi/g < 500	2.30E+04	1.90E+04
2	500 <= nCi/g < 1,000	3.50E+03	2.90E+03
3	1,000 <= nCi/g < 2,000	3.60E+03	2.90E+03
4	2,000 <= nCi/g < 3,000	5.50E+03	4.50E+03
5	3,000 <= nCi/g < 4,000	3.20E+03	2.60E+03
6	4,000 <= nCi/g < 5,000	4.00E+03	3.30E+03
7	5,000 <= nCi/g < 6,000	1.90E+03	1.60E+03
8	6,000 <= nCi/g < 7,000	1.90E+03	1.50E+03
9	7,000 <= nCi/g < 8,000	1.20E+03	9.70E+02
10	8,000 <= nCi/g < 9,000	1.30E+03	1.10E+03
11	9,000 <= nCi/g < 10,000	6.00E+02	4.80E+02
12	10,000 <= nCi/g < 20,000	3.60E+03	2.90E+03
13	20,000 <= nCi/g < 30,000	3.20E+03	2.70E+03
14	30,000 <= nCi/g < 40,000	9.40E+02	7.60E+02
15	40,000 <= nCi/g < 50,000	2.30E+02	1.70E+02
16	50,000 <= nCi/g < 60,000	5.10E+02	4.20E+02
17	60,000 <= nCi/g < 70,000	6.40E+02	5.10E+02
18	70,000 <= nCi/g < 80,000	1.70E+02	1.40E+02
21	100,000 <= nCi/g < 200,000	2.00E+02	1.40E+02
Totals		5.92E+04	4.86E+04

Alpha Activity Distribution

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

TRUMW

ID-EGG-112T-114

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	5.63E-01	1.05E-06	3.53E+03	6.33E-07	3.53E+03	1.26E-06	4.22E+03	7.57E-07	4.22E+03
PU-52	4.82E+03	5.90E-03	4.71E+05	2.48E+01	4.71E+05	7.60E-03	6.06E+05	3.19E+01	6.06E+05

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-112T

CEMENTED SLUDGES (TRU)

C. Code/Name: 700

ORGANIC AND SLUDGE IMMOBILIZATION SYSTEM WASTE

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.

Content Code Description:

There is no content information for this waste stream, which consists of waste from the Rocky Flats Plant.

Total Volume (m3): 1.91

Gross Mass (kg): 2,400.00

Drum Equivalents: 9.00

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

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INEL Waste Profile Sheet

TRUMW

ID-EGG-112T-700

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
9	DRUM	1.91	2,400.00	ORGANIC AND SLUDGE IMMOBILIZATION SYSTEM WASTE
Subtotal 9		1.91	2,400.00	

Total 9**1.91 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 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		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.90E+03	1.70E+03
2	500 <= nCi/g < 1,000	2.60E+02	2.30E+02
3	1,000 <= nCi/g < 2,000	2.40E+02	2.10E+02
Totals		2.40E+03	2.14E+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.

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-52	1.41E+01	3.02E-05	2.41E+03	1.27E-01	2.41E+03	3.44E-05	2.75E+03	1.44E-01	2.75E+03

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			4-2
SLUDGE			4-2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-112T CEMENTED SLUDGES (TRU)

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): 151.16

Gross Mass (kg): 134,500.01

Drum Equivalents: 713.00

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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-112T-834

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
713	DRUM	151.16	134,500.01	HIGH LEVEL ACID
Subtotal	713	151.16	134,500.01	

Total 713**151.16 m3****134,500.01 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			
D002	CORROSIVE	ACID			

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	6.30E+03	6.20E+03
9	7,000 <= nCi/g < 8,000	1.90E+02	1.70E+02
10	8,000 <= nCi/g < 9,000	3.40E+02	3.00E+02
11	9,000 <= nCi/g < 10,000	1.10E+04	9.30E+03
12	10,000 <= nCi/g < 20,000	6.70E+04	5.60E+04
13	20,000 <= nCi/g < 30,000	1.20E+04	1.00E+04
14	30,000 <= nCi/g < 40,000	6.00E+03	5.00E+03
15	40,000 <= nCi/g < 50,000	1.20E+03	9.80E+02
16	50,000 <= nCi/g < 60,000	1.40E+02	1.20E+02
21	100,000 <= nCi/g < 200,000	6.30E+02	5.10E+02
Totals		1.05E+05	8.86E+04

Alpha Activity Distribution

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

TRUMW

ID-EGG-112T-834

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	1.84E+01	1.53E-06	9.50E+01	1.27E-06	9.50E+01	1.83E-06	1.13E+02	1.51E-06	1.13E+02
PU-238	9.97E+01	2.33E-05	3.54E+05	1.71E+01	3.54E+05	2.80E-05	4.25E+05	2.05E+01	4.25E+05
PU-240	1.00E+01	8.20E-05	1.86E+04	8.44E-03	1.86E+04	1.01E-04	2.28E+04	1.04E-02	2.28E+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	
		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 (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	30.0
<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.
ABSORBENT (FLORCO)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-112T CEMENTED SLUDGES (TRU)

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): 176.17

Gross Mass (kg): 144,000.01

Drum Equivalents: 831.00

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-112T-835

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	831	DRUM	176.17	144,000.01	HIGH LEVEL CAUSTIC
Subtotal	831		176.17	144,000.01	

Total 831**176.17 m3****144,000.01 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			

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.00E+02	7.00E+01
5	3,000 <= nCi/g < 4,000	1.20E+02	9.00E+01
11	9,000 <= nCi/g < 10,000	1.50E+03	1.30E+03
12	10,000 <= nCi/g < 20,000	6.80E+04	5.70E+04
13	20,000 <= nCi/g < 30,000	3.90E+04	3.30E+04
14	30,000 <= nCi/g < 40,000	4.90E+03	4.10E+03
15	40,000 <= nCi/g < 50,000	4.80E+03	4.00E+03
16	50,000 <= nCi/g < 60,000	1.50E+02	1.20E+02
17	60,000 <= nCi/g < 70,000	2.90E+02	2.40E+02
18	70,000 <= nCi/g < 80,000	1.00E+02	7.00E+01
19	80,000 <= nCi/g < 90,000	5.60E+02	4.70E+02
20	90,000 <= nCi/g < 100,000	1.50E+02	1.20E+02
21	100,000 <= nCi/g < 200,000	2.90E+02	2.40E+02
22	200,000 <= nCi/g < 300,000	1.30E+02	1.00E+02
23	300,000 <= nCi/g < 400,000	1.50E+02	1.20E+02
25	500,000 <= nCi/g < 600,000	2.90E+02	2.40E+02
Totals		1.21E+05	1.01E+05

Alpha Activity Distribution

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	1.20E+01	7.59E-05	4.70E+03	6.29E-05	4.70E+03	8.99E-05	5.58E+03	7.45E-05	5.58E+03
PU-238	1.49E+02	1.08E-04	1.65E+06	7.95E+01	1.65E+06	1.29E-04	1.96E+06	9.47E+01	1.96E+06
PU-52	1.32E-01	1.32E-06	1.05E+02	5.54E-03	1.05E+02	1.90E-06	1.51E+02	7.95E-03	1.51E+02
PU-83	6.40E-01	6.35E-06	8.07E+04	4.41E+00	8.07E+04	9.09E-06	1.16E+05	6.32E+00	1.16E+05

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 (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	30.0
		Lead 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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-112T-836

A. IDENTIFICATION

INEL ID/Name: ID-EGG-112T CEMENTED SLUDGES (TRU)
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.

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.

Total Volume (m3): 5.51

Gross Mass (kg): 7,500.00

Drum Equivalents: 26.00

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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-112T-836

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
26	DRUM	5.51	7,500.00	HIGH LEVEL SLUDGE/CEMENT
Subtotal	26	5.51	7,500.00	

Total 26**5.51 m3****7,500.00 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)
D002	CORROSIVE	ACID			
D006	CADMIUM	.	7440-43-9		
D007	CHROMIUM	.	7440-47-32		
D008	LEAD	.	7439-92-1		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		
D010	SELENIUM	.	7782-49-2		
D011	SILVER	.	7440-22-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F003	SPENT NON-HALOGENATED SOLVENTS	ACETONE	67-64-1		
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		
P015	BERYLLIUM DUST	.	7440-41-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	4.90E+04	4.40E+04
7	5,000 <= nCi/g < 6,000	5.60E+02	5.10E+02
12	10,000 <= nCi/g < 20,000	1.80E+03	1.60E+03
13	20,000 <= nCi/g < 30,000	1.80E+03	1.60E+03
14	30,000 <= nCi/g < 40,000	1.00E+03	9.30E+02
15	40,000 <= nCi/g < 50,000	1.50E+02	1.30E+02
18	70,000 <= nCi/g < 80,000	3.10E+02	2.70E+02
23	300,000 <= nCi/g < 400,000	2.70E+02	2.50E+02
Totals		5.49E+04	4.93E+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.

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-238	1.59E+01	3.89E-05	5.92E+05	2.86E+01	5.92E+05	4.32E-05	6.56E+05	3.17E+01	6.56E+05
PU-83	5.57E-01	1.13E-08	1.44E+02	7.85E-03	1.44E+02	1.27E-08	1.61E+02	8.80E-03	1.61E+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	
		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	
		Benelex/lead	
		Sheetrock	
		<u>Combustibles</u> (>90% Combustible)	Plastics -
Polyvinyl Chloride (PVC)	0.8		
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.
ABSORBENT (PORTLAND CEMENT)			4-1
WATER (SHOWER WATER, DECON WATER, COOLING WATER)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-112T CEMENTED SLUDGES (TRU)

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.

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.

Total Volume (m3): 1.06

Gross Mass (kg): 1,000.00

Drum Equivalents: 5.00

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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-112T-976

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	5	DRUM	1.06	1,000.00	BLDG 776 PROCESS SLUDGE
Subtotal	5		1.06	1,000.00	

Total	5	1.06 m3	1,000.00 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)
D002	CORROSIVE	ACID			
D006	CADMIUM	.	7440-43-9		
D007	CHROMIUM	.	7440-47-32		
D008	LEAD	.	7439-92-1		
D009	MERCURY	LOW MERCURY <261 MG/KG TOTAL MERCURY	7439-97-6		
D022	CHLOROFORM	.	67-66-3		
D028	1,2-DICHLOROETHANE	.	107-06-2		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		
P015	BERYLLIUM DUS	.	7440-41-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
3	1,000 <= nCi/g < 2,000	1.00E+03	9.20E+02
Totals		1.00E+03	9.20E+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.

Alpha Activity Distribution

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-112T-976

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	2.24E+01	2.16E-05	1.72E+03	9.06E-02	1.72E+03	2.42E-05	1.93E+03	1.02E-01	1.93E+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 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	65.0
	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	15.0 15.0
<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	4.0 1.0 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.
OTHER (SLUDGE CEMENTED IN PORTLAND CEMENT)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-112T CEMENTED SLUDGES (TRU)

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): 9.51

Gross Mass (kg): 7,900.00

Drum Equivalents: 44.86

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-112T-978

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
3	BOX	9.51	7,900.00	LAUNDRY SLUDGE
Subtotal	3	9.51	7,900.00	

Total 3**9.51 m3****7,900.00 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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-112T-978

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	7440-43-9		
D006	CADMIUM		7440-47-32		
D007	CHROMIUM		7439-92-1		
D008	LEAD		7439-97-6		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	127-18-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	79-01-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	75-9-2		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	67-56-1		
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	71-36-3		
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	1330-20-7		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	7440-41-7		
P015	BERYLLIUM DUST				

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.70E+03	1.40E+03
2	500 <= nCi/g < 1,000	4.00E+03	3.40E+03
Totals		5.70E+03	4.80E+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.

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-52	4.00E+01	1.24E-05	9.90E+02	5.20E-02	9.90E+02	1.46E-05	1.16E+03	6.12E-02	1.16E+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	
<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	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	
	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-114T COMBUSTIBLES (TRU)

C. Code/Name: 10 COMBUSTIBLES

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 TRU trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 165.57

Gross Mass (kg): 68,100.00

Drum Equivalents: 781.00

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-10

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	781	DRUM	165.57	68,100.00	COMBUSTIBLES
Subtotal	781		165.57	68,100.00	

Total 781**165.57 m3****68,100.00 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	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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	3.7
	Misc. Non-Combustible -	Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	0.0
		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	
	Inorganic Sludge -	Magnesia (insulations)	
		Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
		Leaded Rubber	2.4
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	31.7
		Polyvinyl Chloride (PVC)	7.9
		Teflon	0.0
		Plexiglass	
<u>Combustibles</u> (>90% Combustible)	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-114T COMBUSTIBLES (TRU)

C. Code/Name: 110

RESEARCH GENERATED WASTE COMPACTIBLE &
COMBUSTIBLE SOLIDS**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): 3.59

Gross Mass (kg): 1,330.00

Drum Equivalents: 16.95

Physical Form: SOLID

Physical Type: PLASTIC, PAPER, 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 is generated at Argonne National Laboratory - East. The waste is derived from research activities performed in a laboratory environment. The waste includes soft plastics, cardboard, rags, paper, and cloth from various processes. The waste is packaged in 55-gallon drums or in SWBs.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-110

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
2	DRUM	0.42	300.00	WIPP PRECERTIFIED RGW COMPACTIBLE & COMBUSTIBLE SOL
1	BOX	3.17	1,030.00	WIPP PRECERTIFIED RGW COMPACTIBLE & COMBUSTIBLE SOL
Subtotal	3	3.59	1,330.00	

Total 3**3.59 m3****1,330.00 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		
D006	CADMIUM		7440-43-9		
D008	LEAD		7439-92-1		
F003	SPENT NON-HALOGENATED SOLVENTS	ACETONE	67-64-1		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 $\leq$ nCi/g $<$ 500	6.30E+01	4.00E+01
11	9,000 $\leq$ nCi/g $<$ 10,000	1.20E+03	8.90E+02
21	100,000 $\leq$ nCi/g $<$ 200,000	6.40E+01	4.10E+01
Totals		1.33E+03	9.71E+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-243	3.00E-02	4.76E-07	9.48E+01	2.78E-10	9.48E+01	7.44E-07	1.48E+02	4.34E-10	1.48E+02
AM-241	4.08E-01	6.38E-06	2.13E+04	3.83E-06	2.13E+04	9.87E-06	3.30E+04	5.92E-06	3.30E+04
PU-239	2.90E+02	2.53E-03	1.57E+05	2.10E-03	1.57E+05	3.90E-03	2.42E+05	3.23E-03	2.42E+05
PU-241	1.77E+00	1.48E-06	2.57E+03	1.78E+00	2.57E+03	1.98E-06	3.45E+03	2.39E+00	3.45E+03

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.
PAPER, CARDBOARD			4-1
PLASTIC			4-1
RAGS, CLOTH			4-1

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-116

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114T COMBUSTIBLES (TRU)

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): 2,695.14

Gross Mass (kg): 621,305.04

Drum Equivalents: 12,712.91

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 TRU (for WIPP) 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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-116

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	850	BOX	2,694.50	621,000.04	CERTIFIED TRU COMBUSTIBLE WASTE
	3	DRUM	0.64	305.00	CERTIFIED TRU COMBUSTIBLE WASTE
Subtotal	853		2,695.14	621,305.04	

Total 853**2,695.14 m3****621,305.04 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		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	4.40E+04	3.10E+04
2	500 <= nCi/g < 1,000	7.20E+04	5.10E+04
3	1,000 <= nCi/g < 2,000	1.20E+05	8.60E+04
4	2,000 <= nCi/g < 3,000	8.90E+04	6.30E+04
5	3,000 <= nCi/g < 4,000	7.90E+04	5.50E+04
6	4,000 <= nCi/g < 5,000	5.20E+04	3.70E+04
7	5,000 <= nCi/g < 6,000	3.70E+04	2.60E+04
8	6,000 <= nCi/g < 7,000	2.70E+04	1.90E+04
9	7,000 <= nCi/g < 8,000	1.90E+04	1.30E+04
10	8,000 <= nCi/g < 9,000	2.10E+04	1.40E+04
11	9,000 <= nCi/g < 10,000	1.40E+04	9.70E+03
12	10,000 <= nCi/g < 20,000	3.70E+04	2.50E+04
13	20,000 <= nCi/g < 30,000	3.70E+03	2.60E+03
14	30,000 <= nCi/g < 40,000	7.90E+02	5.40E+02
15	40,000 <= nCi/g < 50,000	7.80E+01	4.80E+01
16	50,000 <= nCi/g < 60,000	7.20E+02	5.00E+02
20	90,000 <= nCi/g < 100,000	1.10E+02	8.00E+01
Totals		6.16E+05	4.33E+05

Alpha Activity Distribution

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-116

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	5.22E+01	5.17E-05	1.73E+05	3.10E-05	1.73E+05	7.66E-05	2.56E+05	4.59E-05	2.56E+05
PU-52	2.84E+04	2.48E-03	1.98E+05	1.04E+01	1.98E+05	3.50E-03	2.80E+05	1.47E+01	2.80E+05
U-235	8.09E+02	1.14E-04	0.00E+00	2.18E-01	2.18E-01	1.62E-04	0.00E+00	3.11E-01	3.11E-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)	
	Misc. Non-Combustible -	Other HVPM (Zn, Cd)	0.0
		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	
		Lead Rubber	2.4
<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	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-114T COMBUSTIBLES (TRU)

C. Code/Name: 120 DDW COMBUSTIBLE SOLIDS

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): .42

Gross Mass (kg): 150.00

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 is generated at Argonne National Laboratory. The waste is derived from decontamination and disposal of facilities and ancillary systems (e.g. gloveboxes). The composition of the waste is unknown. It is expected to contain some cadmium and lead, and may contain F-listed wastes.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-120

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
2	DRUM	0.42	150.00	WIPP PRECERTIFIED DDW COMBUSTIBLE SOLIDS
Subtotal 2		0.42	150.00	

Total 2**.42 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.

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		
D006	CADMIUM		7440-43-9		
D008	LEAD		7439-92-1		
F003	SPENT NON-HALOGENATED SOLVENTS	ACETONE	67-64-1		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
12	10,000 <= nCi/g < 20,000	9.30E+01	7.00E+01
21	100,000 <= nCi/g < 200,000	5.20E+01	2.90E+01

Totals		1.45E+02	9.90E+01
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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	6.34E-01	1.15E-05	3.85E+04	6.91E-06	3.85E+04	2.00E-05	6.70E+04	1.20E-05	6.70E+04
PU-239	1.41E+02	2.56E-03	1.59E+05	2.12E-03	1.59E+05	4.45E-03	2.76E+05	3.69E-03	2.76E+05

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-330

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114T COMBUSTIBLES (TRU)
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): 5,774.64

Gross Mass (kg): 1,457,150.10

Drum Equivalents: 27,238.89

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. 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.

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
892	DRUM	189.10	87,150.01	DRY PAPER AND RAGS
1762	BOX	5,585.54	1,370,000.09	DRY PAPER AND RAGS
Subtotal	2654	5,774.64	1,457,150.10	

Total	2,654	5,774.64 m3	1,457,150.10 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		
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		
D022	CHLOROFORM		67-66-3		
D029	1,1-DICHLOROETHYLENE		75-35-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	ETHYL BENZENE	100-41-4		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		
F005	SPENT NON-HALOGENATED SOLVENTS	BENZENE	71-43-2		
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.90E+05	1.20E+05
2	500 <= nCi/g < 1,000	2.10E+05	1.40E+05
3	1,000 <= nCi/g < 2,000	2.90E+05	1.90E+05
4	2,000 <= nCi/g < 3,000	1.90E+05	1.20E+05
5	3,000 <= nCi/g < 4,000	1.30E+05	8.60E+04
6	4,000 <= nCi/g < 5,000	1.10E+05	7.00E+04
7	5,000 <= nCi/g < 6,000	7.50E+04	4.80E+04
8	6,000 <= nCi/g < 7,000	5.80E+04	3.70E+04
9	7,000 <= nCi/g < 8,000	3.20E+04	2.00E+04
10	8,000 <= nCi/g < 9,000	2.60E+04	1.60E+04
11	9,000 <= nCi/g < 10,000	2.00E+04	1.20E+04
12	10,000 <= nCi/g < 20,000	5.60E+04	3.50E+04
13	20,000 <= nCi/g < 30,000	2.00E+04	1.30E+04
14	30,000 <= nCi/g < 40,000	4.00E+03	2.50E+03
15	40,000 <= nCi/g < 50,000	2.50E+02	1.60E+02
16	50,000 <= nCi/g < 60,000	2.50E+03	1.60E+03
17	60,000 <= nCi/g < 70,000	6.40E+01	4.10E+01
18	80,000 <= nCi/g < 90,000	2.70E+03	1.80E+03
20	90,000 <= nCi/g < 100,000	6.50E+02	3.70E+02
21	100,000 <= nCi/g < 200,000	6.60E+03	4.50E+03
22	200,000 <= nCi/g < 300,000	1.50E+03	9.10E+02
Totals		1.43E+06	9.19E+05

Alpha Activity Distribution

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	6.11E+02	1.98E-04	6.61E+05	1.19E-04	6.61E+05	3.14E-04	1.05E+06	1.88E-04	1.05E+06
PU-52	5.70E+04	2.75E-03	2.19E+05	1.15E+01	2.19E+05	4.36E-03	3.48E+05	1.83E+01	3.48E+05
U-235	6.67E+03	1.60E-03	0.00E+00	3.08E+00	3.08E+00	2.51E-03	0.00E+00	4.83E+00	4.83E+00
U-238	1.40E+00	1.79E-06	0.00E+00	6.03E-04	6.03E-04	2.81E-06	0.00E+00	9.43E-04	9.43E-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	0.1
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	3.7
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	0.0
		Ceramic (molds)	
	Misc. Non-Combustible -	Firebrick	
		Concrete	
		Portland Cement	
		Dir/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	
		Leaded Rubber	2.4
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelax/lead	
		Sheetrock	
	Plastics -	Polyethylene	31.7
		Polyvinyl Chloride (PVC)	7.9
		Tellon	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.
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 (CONCRETE, CEMENT)			4-1
OTHER (LAUNDRY LINT)			4-1
PAPER (CARDBOARD, PAPER)			4-1
PLASTIC			4-1
RAGS			4-1
RUBBER (SURGICAL GLOVES)			4-1
WOOD			4-1

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4 of 11

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114T COMBUSTIBLES (TRU)
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): 778.34

Gross Mass (kg): 222,119.01

Drum Equivalents: 3,671.42

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 absorbent 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. Absorbent 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 are lead-lined.

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	950	DRUM	201.40	84,219.01	MOIST PAPER AND RAGS
	182	BOX	576.94	137,900.01	MOIST PAPER AND RAGS
Subtotal	1132		778.34	222,119.01	

Total 1,132**778.34 m3****222,119.01 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			
D002	CORROS.VE	ACID			
D008	LEAD		7439-92-1		
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		
D022	CHLOROFORM		67-66-3		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	ACETONE	67-64-1		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	3.60E+04	2.30E+04
2	500 <= nCi/g < 1,000	3.80E+04	2.60E+04
3	1,000 <= nCi/g < 2,000	4.80E+04	3.30E+04
4	2,000 <= nCi/g < 3,000	2.20E+04	1.50E+04
5	3,000 <= nCi/g < 4,000	1.70E+04	1.10E+04
6	4,000 <= nCi/g < 5,000	1.30E+04	8.40E+03
7	5,000 <= nCi/g < 6,000	8.30E+03	5.50E+03
8	6,000 <= nCi/g < 7,000	7.30E+03	4.60E+03
9	7,000 <= nCi/g < 8,000	5.10E+03	3.20E+03
10	8,000 <= nCi/g < 9,000	4.10E+03	2.80E+03
11	9,000 <= nCi/g < 10,000	6.30E+03	3.90E+03
12	10,000 <= nCi/g < 20,000	1.10E+04	7.00E+03
13	20,000 <= nCi/g < 30,000	1.30E+03	8.70E+02
14	30,000 <= nCi/g < 40,000	5.30E+02	4.00E+02
15	40,000 <= nCi/g < 50,000	3.50E+02	2.60E+02
16	50,000 <= nCi/g < 60,000	3.00E+02	2.30E+02
17	60,000 <= nCi/g < 70,000	8.60E+02	5.30E+02
18	70,000 <= nCi/g < 80,000	1.00E+02	7.70E+01
19	80,000 <= nCi/g < 90,000	2.30E+02	1.90E+02
20	90,000 <= nCi/g < 100,000	1.00E+02	7.70E+01
21	100,000 <= nCi/g < 200,000	8.30E+02	6.30E+02
22	200,000 <= nCi/g < 300,000	5.80E+02	4.40E+02
23	300,000 <= nCi/g < 400,000	1.60E+02	1.10E+02
24	400,000 <= nCi/g < 500,000	1.10E+02	8.70E+01
26	600,000 <= nCi/g < 700,000	2.90E+02	2.20E+02
Totals		2.22E+05	1.48E+05

Alpha Activity Distribution

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-336

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	1.85E+02	6.16E-04	2.06E+06	3.70E-04	2.06E+06	8.14E-04	2.72E+06	4.89E-04	2.72E+06
PU-52	9.04E+03	3.81E-03	3.04E+05	1.60E+01	3.04E+05	5.24E-03	4.18E+05	2.20E+01	4.18E+05
U-235	3.47E+02	9.36E-04	0.00E+00	1.80E+00	1.80E+00	1.50E-03	0.00E+00	2.89E+00	2.89E+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	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	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
		Leaded Rubber	2.1
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	37.6
		Polyvinyl Chloride (PVC)	9.9
		Teflon	0.0
		Plexiglass	
<u>Combustibles</u> (>90% Combustible)	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 (SCRAP)			4-1
ORGANICS	6 - 14	LB/FT3	4-1
OTHER (CONCRETE, CEMENT, BATTERIES)			4-1
PAPER			4-1
PLASTIC (PE BOTTLES)			4-1
RAGS			4-1
RUBBER (SURGICAL GLOVES)			4-1

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INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-336

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114T COMBUSTIBLES (TRU)

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): 170.38

Gross Mass (kg): 59,090.00

Drum Equivalents: 803.67

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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-337

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	699	DRUM	148.19	53,190.00	PLASTICS, TEFLON, WASH, PVC
	7	BOX	22.19	5,900.00	PLASTICS, TEFLON, WASH, PVC
Subtotal	706		170.38	59,090.00	

Total 706**170.38 m3****59,090.00 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		
D022	CHLOROFORM		67-66-3		
D029	1,1-DICHLOROETHYLENE		75-35-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	ACETONE	67-64-1		
F003	SPENT NON-HALOGENATED SOLVENTS	ETHYL BENZENE	100-41-4		
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		
F005	SPENT NON-HALOGENATED SOLVENTS	BENZENE	71-43-2		
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.90E+04	1.20E+04
2	500 <= nCi/g < 1,000	7.30E+03	5.40E+03
3	1,000 <= nCi/g < 2,000	1.70E+04	1.10E+04
4	2,000 <= nCi/g < 3,000	9.10E+03	6.00E+03
5	3,000 <= nCi/g < 4,000	7.20E+03	4.70E+03
6	4,000 <= nCi/g < 5,000	4.60E+03	3.10E+03
7	5,000 <= nCi/g < 6,000	1.90E+03	1.20E+03
8	6,000 <= nCi/g < 7,000	8.90E+02	6.70E+02
9	7,000 <= nCi/g < 8,000	2.30E+02	1.40E+02
10	8,000 <= nCi/g < 9,000	6.20E+02	3.90E+02
11	9,000 <= nCi/g < 10,000	5.60E+02	4.80E+02
12	10,000 <= nCi/g < 20,000	1.30E+03	9.60E+02
13	20,000 <= nCi/g < 30,000	1.20E+03	9.50E+02
14	30,000 <= nCi/g < 40,000	6.40E+02	4.80E+02
15	40,000 <= nCi/g < 50,000	3.30E+02	2.60E+02
16	50,000 <= nCi/g < 60,000	4.20E+02	3.30E+02
17	60,000 <= nCi/g < 70,000	3.10E+02	2.20E+02
18	70,000 <= nCi/g < 80,000	2.70E+02	2.20E+02
19	80,000 <= nCi/g < 90,000	3.90E+02	3.00E+02
20	90,000 <= nCi/g < 100,000	9.40E+01	7.10E+01
21	100,000 <= nCi/g < 200,000	1.30E+03	1.00E+03
22	200,000 <= nCi/g < 300,000	1.50E+02	1.00E+02
23	300,000 <= nCi/g < 400,000	8.50E+01	6.20E+01
24	400,000 <= nCi/g < 500,000	6.40E+01	4.20E+01
Totals		7.51E+04	5.01E+04

Alpha Activity Distribution

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INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-337

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	1.02E+02	4.32E-04	1.45E+06	2.59E-04	1.45E+06	6.06E-04	2.03E+06	3.63E-04	2.03E+06
NP-237	7.00E+00	8.17E-05	5.76E+01	2.47E-03	5.76E+01	1.11E-04	7.83E+01	3.35E-03	7.83E+01
PU-242	2.00E+00	2.33E-05	9.16E+01	2.17E-07	9.16E+01	3.17E-05	1.25E+02	2.95E-07	1.25E+02
PU-52	3.30E+03	3.85E-03	3.07E+05	1.62E+01	3.07E+05	5.17E-03	4.12E+05	2.17E+01	4.12E+05
U-235	9.00E+00	1.53E-04	0.00E+00	2.94E-01	2.94E-01	2.48E-04	0.00E+00	4.77E-01	4.77E-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 Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	7.6
<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	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
PAPER			4-1
PLASTIC (PE, PVC, TEFLON)			4-1
RUBBER (NONLEADED RUBBER ITEMS, SURGICAL GLOVES)			4-1

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INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-337

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114T COMBUSTIBLES (TRU)

C. Code/Name: 460

WASHABLES, RUBBER, PLASTICS

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): 1.27

Gross Mass (kg): 1,300.00

Drum Equivalents: 6.00

Physical Form: SOLID

Physical Type: RUBBER, 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:**

There is very little content information for this waste stream, which consists of washables, rubber and plastic wastes from the Rocky Flats Plant.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-460

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
6	DRUM	1.27	1,300.00	WASHABLES, RUBBER, PLASTICS
Subtotal 6		1.27	1,300.00	

Total 6**1.27 m3****1,300.00 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)
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
3	1,000 $\leq$ nCi/g < 2,000	2.20E+02	1.70E+02
6	4,000 $\leq$ nCi/g < 5,000	3.60E+02	2.70E+02
7	5,000 $\leq$ nCi/g < 6,000	2.20E+02	1.80E+02
8	6,000 $\leq$ nCi/g < 7,000	2.50E+02	2.00E+02
9	7,000 $\leq$ nCi/g < 8,000	2.20E+02	1.70E+02
Totals		1.27E+03	9.90E+02

Alpha Activity Distribution

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

TRUMW

ID-EGG-114T-460

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	8.10E+01	3.19E-04	2.55E+04	1.34E+00	2.55E+04	4.04E-04	3.23E+04	1.70E+00	3.23E+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.
PLASTIC			4-1, 2
RAGS			4-1, 2
RUBBER			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114T COMBUSTIBLES (TRU)
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): 79.89

Gross Mass (kg): 25,370.00

Drum Equivalents: 376.82

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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-826

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
3	DRUM	0.64	370.00	COMBUSTIBLE EQUIPMENT BOXES OR FLOOR SWEEPINGS AND
25	BOX	79.25	25,000.00	COMBUSTIBLE EQUIPMENT BOXES OR FLOOR SWEEPINGS AND
Subtotal	28	79.89	25,370.00	

Total 28**79.89 m3****25,370.00 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		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
2	500 $\leq$ nCi/g < 1,000	3.60E+03	3.80E+03
3	1,000 $\leq$ nCi/g < 2,000	1.70E+04	1.60E+04
4	2,000 $\leq$ nCi/g < 3,000	2.40E+03	2.40E+03
5	3,000 $\leq$ nCi/g < 4,000	5.00E+02	5.00E+02
11	9,000 $\leq$ nCi/g < 10,000	1.30E+03	1.30E+03
12	10,000 $\leq$ nCi/g < 20,000	1.40E+03	1.10E+03
13	20,000 $\leq$ nCi/g < 30,000	1.90E+02	1.40E+02
21	100,000 $\leq$ nCi/g < 200,000	1.00E+02	7.70E+01
Totals		2.67E+04	2.53E+04

Alpha Activity Distribution

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	4.18E+00	5.97E-06	2.00E+04	3.58E-06	2.00E+04	9.19E-06	3.07E+04	5.51E-06	3.07E+04
PU-239	3.00E+01	2.93E-06	1.82E+02	2.43E-06	1.82E+02	2.93E-06	1.82E+02	2.43E-06	1.82E+02
PU-238	3.80E+00	1.05E-05	1.59E+05	7.69E+00	1.59E+05	1.30E-05	1.98E+05	9.57E+00	1.98E+05
PU-240	4.00E+00	1.96E-06	4.44E+02	2.02E-04	4.44E+02	1.96E-06	4.44E+02	2.02E-04	4.44E+02
PU-83	8.12E-01	1.18E-07	1.49E+03	8.17E-02	1.49E+03	1.53E-07	1.95E+03	1.07E-01	1.95E+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	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			
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		
		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

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INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-827

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114T COMBUSTIBLES (TRU)

C. Code/Name: 827

COMBUSTIBLE EQUIPMENT DRUMS

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): 1.91

Gross Mass (kg): 710.00

Drum Equivalents: 9.00

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:**

There is no content information on this code. This waste is probably like content code 826 (combustible equipment boxes) from Mound Laboratory except that it is smaller items which fit into drums instead of boxes. This waste stream is identified as being certified (for WIPP) TRU waste.

ID-EGG-114T-827 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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-827

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	9	DRUM	1.91	710.00	COMBUSTIBLE EQUIPMENT DRUMS
Subtotal	9		1.91	710.00	

Total 9**1.91 m3****710.00 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		
D009	MERCURY	ELEMENTAL MERCURY CONTAMINATED WITH RADIOACTIVE MATERIALS	7439-97-6		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW. refer to the ALLMW report for information on similar constituents.

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)
1	100 $\leq$ nCi/g < 500	1.40E+02	8.20E+01
10	8,000 $\leq$ nCi/g < 9,000	7.30E+01	4.30E+01
13	20,000 $\leq$ nCi/g < 30,000	5.30E+01	2.30E+01
16	50,000 $\leq$ nCi/g < 60,000	2.20E+02	1.60E+02
19	80,000 $\leq$ nCi/g < 90,000	5.50E+01	2.50E+01
21	100,000 $\leq$ nCi/g < 200,000	7.30E+01	4.30E+01
Totals		6.14E+02	3.76E+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 CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	9.50E+01	7.30E+01
Totals		9.50E+01	7.30E+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.

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	3.66E+00	1.85E-05	6.19E+04	1.11E-05	6.19E+04	2.65E-05	8.86E+04	1.59E-05	8.86E+04
PU-52	2.64E-01	1.85E-06	1.47E+02	7.74E-03	1.47E+02	3.21E-06	2.56E+02	1.35E-02	2.56E+02
PU-83	1.05E+00	1.66E-05	2.11E+05	1.15E+01	2.11E+05	3.31E-05	4.21E+05	2.30E+01	4.21E+05

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	1.05E-06	6.51E+01	8.70E-07	6.51E+01	1.38E-06	8.54E+01	1.14E-06	8.54E+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		
		Other Glass		
	Metals -	Carbon Steel	2.0	
		Stainless Steel	1.0	
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal		
		Lead (Bulk Pb)	1.0	
	Misc. Non-Combustible -	Other HVPM(Zn,Cd)	0.0	
		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		
		Benelex/lead		
		Sheetrock		
		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

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

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114T COMBUSTIBLES (TRU)
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): .85

Gross Mass (kg): 365.00

Drum Equivalents: 4.00

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 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 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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-900

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
4	DRUM	0.85	365.00	LSA PLASTICS, PAPER, ETC.
Subtotal 4		0.85	365.00	

Total 4

.85 m3

365.00 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		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 $\leq$ nCi/g $<$ 500	1.40E+02	9.30E+01
Totals		1.40E+02	9.30E+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.

Alpha Activity Distribution

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-900

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	3.00E-01	2.17E-06	1.73E+02	9.10E-03	1.73E+02	3.24E-06	2.59E+02	1.36E-02	2.59E+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	0.9
		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 Fiter 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
<u>Combustibles</u> (>90% Combustible)		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/BOX	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-114T COMBUSTIBLES (TRU)

C. Code/Name: 970 WOOD

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): 109.90

Gross Mass (kg): 33,840.00

Drum Equivalents: 518.40

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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-114T-970

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
10	DRUM	2.12	840.00	WOOD
34	BOX	107.78	33,000.00	WOOD
Subtotal 44		109.90	33,840.00	

Total 44**109.90 m3****33,840.00 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		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
2	500 <= nCi/g < 1,000	9.90E+03	7.90E+03
3	1,000 <= nCi/g < 2,000	2.30E+04	1.60E+04
4	2,000 <= nCi/g < 3,000	2.80E+02	2.10E+02
5	3,000 <= nCi/g < 4,000	7.50E+01	5.20E+01
Totals		3.33E+04	2.42E+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.

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-52	4.62E+02	9.38E-05	7.48E+03	3.93E-01	7.48E+03	1.31E-04	1.04E+04	5.48E-01	1.04E+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	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	
	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	8.8
		Polyvinyl Chloride (PVC)	2.2
		Teflon	0.0
	Plexiglass	Plexiglass	
<u>Combustibles</u> (>90% Combustible)	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-DR)			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-115T CONCRETE - BRICK (TRU)

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): 18.23

Gross Mass (kg): 11,970.00

Drum Equivalents: 86.00

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 TRU (for WIPP) 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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-115T-122

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	86	DRUM	18.23	11,970.00	CERTIFIED TRU INORGANIC SOLID WASTE
Subtotal	86		18.23	11,970.00	

Total 86**18.23 m3****11,970.00 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.

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		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	5.20E+03	4.60E+03
2	500 <= nCi/g < 1,000	1.40E+03	1.10E+03
3	1,000 <= nCi/g < 2,000	1.40E+03	1.00E+03
4	2,000 <= nCi/g < 3,000	1.90E+02	1.30E+02
5	3,000 <= nCi/g < 4,000	1.10E+02	8.00E+01
6	4,000 <= nCi/g < 5,000	8.90E+01	5.90E+01
8	6,000 <= nCi/g < 7,000	1.80E+02	1.20E+02
11	9,000 <= nCi/g < 10,000	1.80E+02	1.20E+02
12	10,000 <= nCi/g < 20,000	7.10E+02	4.70E+02
13	20,000 <= nCi/g < 30,000	1.90E+02	1.30E+02
14	30,000 <= nCi/g < 40,000	2.80E+02	1.90E+02
15	40,000 <= nCi/g < 50,000	5.30E+02	3.50E+02
16	50,000 <= nCi/g < 60,000	3.70E+02	2.50E+02
17	60,000 <= nCi/g < 70,000	1.00E+02	7.00E+01
18	70,000 <= nCi/g < 80,000	3.30E+02	2.00E+02
19	80,000 <= nCi/g < 90,000	9.40E+01	6.40E+01
20	90,000 <= nCi/g < 100,000	9.10E+01	6.10E+01
21	100,000 <= nCi/g < 200,000	7.40E+02	5.00E+02
Totals		1.22E+04	9.49E+03

Alpha Activity Distribution

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	2.70E-02	2.33E-07	7.81E+02	1.40E-07	7.81E+02	3.86E-07	1.29E+03	2.32E-07	1.29E+03
PU-52	2.64E+03	7.86E-03	6.27E+05	3.30E+01	6.27E+05	1.18E-02	9.40E+05	4.94E+01	9.40E+05
U-235	6.60E+01	4.23E-04	0.00E+00	8.14E-01	8.14E-01	6.37E-04	0.00E+00	1.23E+00	1.23E+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

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-115T CONCRETE - BRICK (TRU)

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): 111.38

Gross Mass (kg): 55,600.00

Drum Equivalents: 525.39

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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-115T-371

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
331	DRUM	70.17	41,750.00	FIREBRICK
13	BOX	41.21	13,850.00	FIREBRICK
Subtotal	344	111.38	55,600.00	

Total 344**111.38 m3****55,600.00 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)
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.10E+04	9.50E+03
2	500 <= nCi/g < 1,000	1.10E+04	8.80E+03
3	1,000 <= nCi/g < 2,000	9.80E+03	7.20E+03
4	2,000 <= nCi/g < 3,000	1.00E+03	8.10E+02
5	3,000 <= nCi/g < 4,000	1.20E+03	9.70E+02
6	4,000 <= nCi/g < 5,000	1.50E+03	1.20E+03
7	5,000 <= nCi/g < 6,000	5.90E+02	4.30E+02
8	6,000 <= nCi/g < 7,000	1.40E+03	1.10E+03
9	7,000 <= nCi/g < 8,000	8.50E+02	6.70E+02
10	8,000 <= nCi/g < 9,000	1.80E+02	1.40E+02
11	9,000 <= nCi/g < 10,000	6.60E+02	5.20E+02
12	10,000 <= nCi/g < 20,000	5.00E+03	3.90E+03
13	20,000 <= nCi/g < 30,000	3.90E+03	3.00E+03
14	30,000 <= nCi/g < 40,000	1.80E+03	1.40E+03
15	40,000 <= nCi/g < 50,000	1.50E+03	1.20E+03
16	50,000 <= nCi/g < 60,000	1.00E+03	7.80E+02
17	60,000 <= nCi/g < 70,000	6.50E+02	4.90E+02
18	70,000 <= nCi/g < 80,000	8.30E+02	6.30E+02
19	80,000 <= nCi/g < 90,000	2.80E+02	2.10E+02
20	90,000 <= nCi/g < 100,000	1.80E+02	1.40E+02
21	100,000 <= nCi/g < 200,000	3.90E+02	3.00E+02
Totals		5.47E+04	4.34E+04

Alpha Activity Distribution

1. The TRU alpha activity concentration represented in this section consists of alpha-emitting transuranium radionuclides (a radionuclide having an atomic number $Z \geq 92$ and half-life greater than 20 years). All transuranium decay chain progeny classified as TRU are included in 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	1.52E+00	1.66E-05	5.55E+04	9.95E-06	5.55E+04	2.25E-05	7.53E+04	1.35E-05	7.53E+04
PU-52	7.51E+03	8.01E-03	6.39E+05	3.36E+01	6.39E+05	1.05E-02	8.35E+05	4.39E+01	8.35E+05
U-235	1.30E+01	1.51E-04	0.00E+00	2.91E-01	2.91E-01	2.05E-04	0.00E+00	3.95E-01	3.95E-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	
		Other Glass	
	Metals -	Carbon Steel	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	0.1
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	0.0
		Ceramic (molds)	
	Misc. Non-Combustible -	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)	
	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	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	3.4
		Polyvinyl Chloride (PVC)	0.9
		Teflon	0.0
		Plexiglass	
	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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-115T-375

A. IDENTIFICATION

INEL ID/Name: ID-EGG-115T CONCRETE - BRICK (TRU)
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): .85

Gross Mass (kg): 600.00

Drum Equivalents: 4.00

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-115T-375

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
4	DRUM	0.85	600.00	OIL-DRI RESIDUE FROM INCINERATOR
Subtotal	4	0.85	600.00	

Total 4**.85 m3****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)
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
2	500 $\leq$ nCi/g < 1,000	1.50E+02	1.30E+02
8	6,000 $\leq$ nCi/g < 7,000	7.30E+01	5.00E+01
11	9,000 $\leq$ nCi/g < 10,000	8.60E+01	6.40E+01
12	10,000 $\leq$ nCi/g < 20,000	9.10E+01	6.80E+01
18	70,000 $\leq$ nCi/g < 80,000	8.50E+01	6.30E+01
21	100,000 $\leq$ nCi/g < 200,000	7.90E+01	5.60E+01
Totals		5.64E+02	4.31E+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-52	3.07E+02	3.78E-03	3.02E+05	1.59E+01	3.02E+05	5.26E-03	4.19E+05	2.20E+01	4.19E+05

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	
		Benelux/lead	
		Sheetrock	
		Plastics -	
		Polyethylene	5.6
		Polyvinyl Chloride (PVC)	1.4
		Tellon	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-118T FILTERS (TRU)

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): 383.08

Gross Mass (kg): 100,610.01

Drum Equivalents: 1,807.00

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**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 199 are: 335, 338, 376, and 490. The four content codes are included in the insulation and filters category.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-118T-119

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
222	DRUM	47.06	15,710.00	CERTIFIED TRU HEPA FILTER WASTE
106	BOX	336.02	84,900.01	CERTIFIED TRU HEPA FILTER WASTE
Subtotal	328	383.08	100,610.01	

Total 328**383.08 m3****100,610.01 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			
D002	CORROSIVE	ACID			
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.90E+04	1.40E+04
2	500 <= nCi/g < 1,000	2.10E+04	1.60E+04
3	1,000 <= nCi/g < 2,000	2.00E+04	1.50E+04
4	2,000 <= nCi/g < 3,000	6.60E+03	5.00E+03
5	3,000 <= nCi/g < 4,000	3.70E+03	2.50E+03
6	4,000 <= nCi/g < 5,000	4.40E+03	3.30E+03
7	5,000 <= nCi/g < 6,000	3.90E+03	2.90E+03
8	6,000 <= nCi/g < 7,000	1.40E+03	1.00E+03
9	7,000 <= nCi/g < 8,000	2.60E+02	1.60E+02
10	8,000 <= nCi/g < 9,000	2.60E+02	1.60E+02
11	9,000 <= nCi/g < 10,000	9.90E+02	7.10E+02
12	10,000 <= nCi/g < 20,000	5.30E+03	3.30E+03
13	20,000 <= nCi/g < 30,000	5.10E+03	2.90E+03
14	30,000 <= nCi/g < 40,000	1.80E+03	9.80E+02
15	40,000 <= nCi/g < 50,000	1.80E+03	8.40E+02
16	50,000 <= nCi/g < 60,000	9.80E+02	5.50E+02
17	60,000 <= nCi/g < 70,000	6.60E+02	3.60E+02
18	70,000 <= nCi/g < 80,000	4.30E+02	2.50E+02
19	80,000 <= nCi/g < 90,000	5.00E+02	2.50E+02
20	90,000 <= nCi/g < 100,000	4.50E+02	2.40E+02
21	100,000 <= nCi/g < 200,000	7.70E+02	4.30E+02
Totals		9.93E+04	7.08E+04

Alpha Activity Distribution

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	4.42E+00	3.65E-05	1.22E+05	2.19E-05	1.22E+05	8.29E-05	2.77E+05	4.97E-05	2.77E+05
PU-52	9.77E+03	8.08E-03	6.45E+05	3.39E+01	6.45E+05	1.46E-02	1.16E+06	6.12E+01	1.16E+06
U-235	3.10E+01	4.16E-04	0.00E+00	8.00E-01	8.00E-01	7.96E-04	0.00E+00	1.53E+00	1.53E+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	
		Dirt/Soil	
		Ash	
		Oil-dri	4.4
		Vermiculite	
		Salts	
	Filters/Insulation -	Glass Filter Media	52.9
		Asbestos (filter, insulation)	
		Filter Dust	35.3
<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	
	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
	Plastics -	Benelex/lead	
		Sheetrock	
		Polyethylene	5.9
		Polyvinyl Chloride (PVC)	1.5
		Tellon	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.
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-118T FILTERS (TRU)

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): 1.48

Gross Mass (kg): 542.00

Drum Equivalents: 7.00

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

TRUMW

ID-EGG-118T-328

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
7	DRUM	1.48	542.00	FULFLO INCINERATOR FILTERS
Subtotal 7		1.48	542.00	

Total 7**1.48 m3****542.00 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	OTHER CORROSIVES			
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
12	10,000 <= nCi/g < 20,000	8.60E+01	6.40E+01
13	20,000 <= nCi/g < 30,000	9.80E+01	7.60E+01
15	40,000 <= nCi/g < 50,000	7.70E+01	5.40E+01
16	50,000 <= nCi/g < 60,000	7.20E+01	4.90E+01
18	70,000 <= nCi/g < 80,000	1.50E+02	1.00E+02
20	90,000 <= nCi/g < 100,000	6.80E+01	4.50E+01
Totals		5.51E+02	3.88E+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-52	3.69E+02	4.01E-03	3.20E+05	1.68E+01	3.20E+05	5.79E-03	4.62E+05	2.43E+01	4.62E+05

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
		Dir/Soil	
		Ash	
		Oil-dri	
		Vermiculite	8.2
		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	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	13.8
		Polyvinyl Chloride (PVC)	3.4
		Tellon	0.0
<u>Combustibles</u> (>90% Combustible)	Rubber -	Plexiglass	
		Rubber	
	Misc. Combustibles -	Surgeons' Glove	
		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-118T FILTERS (TRU)

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): 26.24

Gross Mass (kg): 6,522.00

Drum Equivalents: 123.76

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-118T-335

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
49	DRUM	10.39	3,222.00	ABSOLUTE 8 X 8 FILTERS
5	BOX	15.85	3,300.00	ABSOLUTE 8 X 8 FILTERS
Subtotal	54	26.24	6,522.00	

Total 54**26.24 m3****6,522.00 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			
D002	CORROSIVE	ACID			
D022	CHLOROFORM		67-66-3		
D028	1,2-DICHLOROETHANE		107-06-2		
D029	1,1-DICHLOROETHYLENE		75-35-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	ACETONE	67-64-1		
F005	SPENT NON-HALOGENATED SOLVENTS	BENZENE	71-43-2		
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
3	1,000 $\leq$ nCi/g < 2,000	5.20E+02	3.40E+02
4	2,000 $\leq$ nCi/g < 3,000	5.00E+02	2.50E+02
5	3,000 $\leq$ nCi/g < 4,000	4.50E+02	3.10E+02
6	4,000 $\leq$ nCi/g < 5,000	3.50E+02	2.30E+02
7	5,000 $\leq$ nCi/g < 6,000	5.40E+01	3.20E+01
10	8,000 $\leq$ nCi/g < 9,000	6.40E+01	4.10E+01
11	9,000 $\leq$ nCi/g < 10,000	4.00E+02	2.90E+02
12	10,000 $\leq$ nCi/g < 20,000	1.70E+03	9.90E+02
13	20,000 $\leq$ nCi/g < 30,000	1.60E+03	9.30E+02
14	30,000 $\leq$ nCi/g < 40,000	8.60E+02	5.10E+02
22	200,000 $\leq$ nCi/g < 300,000	7.10E+01	4.80E+01
Totals		6.57E+03	3.97E+03

Alpha Activity Distribution

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	6.03E+00	7.56E-05	2.53E+05	4.54E-05	2.53E+05	1.10E-04	3.69E+05	6.63E-05	3.69E+05
PU-52	1.29E+03	1.36E-03	1.08E+05	5.69E+00	1.08E+05	2.23E-03	1.78E+05	9.34E+00	1.78E+05
U-235	2.80E+01	3.90E-05	0.00E+00	7.50E-02	7.50E-02	6.66E-05	0.00E+00	1.28E-01	1.28E-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	
	Partially Combustible -	Leaded Rubber	
<u>Partial Combustible</u> (10%-90% Combustible)		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	5.9
		Polyvinyl Chloride (PVC)	1.5
<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 (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-118T FILTERS (TRU)

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): 60.16

Gross Mass (kg): 20,330.00

Drum Equivalents: 283.76

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-118T-338

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
209	DRUM	44.31	15,730.00	INSULATION AND CWS FILTER MEDIA
5	BOX	15.85	4,600.00	INSULATION AND CWS FILTER MEDIA
Subtotal	214	60.16	20,330.00	

Total 214**60.16 m3****20,330.00 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			
D002	CORROSIVE	ACID			
D022	CHLOROFORM		67-66-3		
D028	1,2-DICHLOROETHANE		107-06-2		
D029	1,1-DICHLOROETHYLENE		75-35-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F005	SPENT NON-HALOGENATED SOLVENTS	BENZENE	71-43-2		
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
2	500 <= nCvg < 1,000	9.30E+01	7.00E+01
3	1,000 <= nCvg < 2,000	4.80E+03	3.30E+03
4	2,000 <= nCvg < 3,000	2.40E+02	1.70E+02
5	3,000 <= nCvg < 4,000	4.80E+02	3.70E+02
6	4,000 <= nCvg < 5,000	5.20E+02	3.90E+02
7	5,000 <= nCvg < 6,000	5.20E+02	4.10E+02
8	6,000 <= nCvg < 7,000	3.20E+02	2.30E+02
9	7,000 <= nCvg < 8,000	2.40E+02	1.80E+02
10	8,000 <= nCvg < 9,000	6.80E+01	4.50E+01
11	9,000 <= nCvg < 10,000	3.00E+02	1.90E+02
12	10,000 <= nCvg < 20,000	1.60E+03	1.00E+03
13	20,000 <= nCvg < 30,000	2.60E+03	1.90E+03
14	30,000 <= nCvg < 40,000	2.60E+03	1.80E+03
15	40,000 <= nCvg < 50,000	2.70E+03	1.90E+03
16	50,000 <= nCvg < 60,000	1.50E+03	1.00E+03
17	60,000 <= nCvg < 70,000	1.00E+03	7.10E+02
18	70,000 <= nCvg < 80,000	4.20E+02	2.80E+02
19	80,000 <= nCvg < 90,000	1.50E+02	1.00E+02
Totals		2.02E+04	1.40E+04

Alpha Activity Distribution

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	2.00E-01	1.64E-07	5.51E+02	9.87E-08	5.51E+02	2.40E-07	8.02E+02	1.44E-07	8.02E+02
PU-52	6.49E+03	5.58E-03	4.45E+05	2.34E+01	4.45E+05	8.10E-03	6.47E+05	3.40E+01	6.47E+05

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	42.1
		Asbestos (filter, insulation)	42.1
		Filter Dust	4.0
		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	
		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/FT3	4-1
WOOD			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-118T FILTERS (TRU)

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): 3.39

Gross Mass (kg): 1,040.00

Drum Equivalents: 16.00

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-118T-360

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
16	DRUM	3.39	1,040.00	INSULATION
Subtotal	16	3.39	1,040.00	

Total 16**3.39 m3****1,040.00 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			
D002	CORROSIVE	ACID			
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	2.30E+02	2.10E+02
2	500 <= nCi/g < 1,000	3.70E+02	3.00E+02
3	1,000 <= nCi/g < 2,000	1.60E+02	1.10E+02
5	3,000 <= nCi/g < 4,000	2.20E+02	1.60E+02
6	4,000 <= nCi/g < 5,000	9.10E+01	6.80E+01
7	5,000 <= nCi/g < 6,000	5.40E+01	3.20E+01
9	7,000 <= nCi/g < 8,000	5.40E+01	3.20E+01
12	10,000 <= nCi/g < 20,000	1.10E+02	8.80E+01
14	30,000 <= nCi/g < 40,000	2.20E+02	1.60E+02
17	60,000 <= nCi/g < 70,000	8.20E+01	5.90E+01
Totals		1.59E+03	1.22E+03

Alpha Activity Distribution

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	2.17E+02	1.77E-03	1.41E+05	7.44E+00	1.41E+05	2.50E-03	2.00E+05	1.05E+01	2.00E+05

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTS

Major Category	Minor Category	Constituent	Composition (wt %)
<u>Non-Combustibles</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	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	
<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
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-118T FILTERS (TRU)

C. Code/Name: 376

CEMENTED INSULATION AND 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): 460.20

Gross Mass (kg): 172,430.01

Drum Equivalents: 2,170.76

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.

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23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-118T-376

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
2096	DRUM	444.35	168,760.01	CEMENTED INSULATION AND FILTER MEDIA
5	BOX	15.85	3,670.00	CEMENTED INSULATION AND FILTER MEDIA
Subtotal	2101	460.20	172,430.01	

Total 2,101**460.20 m3****172,430.01 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			
D002	CORROSIVE	ACID			
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.80E+03	1.20E+03
2	500 <= nCi/g < 1,000	3.50E+03	2.60E+03
3	1,000 <= nCi/g < 2,000	9.70E+03	6.40E+03
4	2,000 <= nCi/g < 3,000	6.70E+03	4.70E+03
5	3,000 <= nCi/g < 4,000	7.40E+03	5.00E+03
6	4,000 <= nCi/g < 5,000	5.70E+03	4.10E+03
7	5,000 <= nCi/g < 6,000	3.70E+03	2.60E+03
8	6,000 <= nCi/g < 7,000	3.40E+03	2.40E+03
9	7,000 <= nCi/g < 8,000	4.50E+03	3.10E+03
10	8,000 <= nCi/g < 9,000	3.40E+03	2.40E+03
11	9,000 <= nCi/g < 10,000	4.40E+03	3.10E+03
12	10,000 <= nCi/g < 20,000	3.10E+04	2.20E+04
13	20,000 <= nCi/g < 30,000	2.10E+04	1.50E+04
14	30,000 <= nCi/g < 40,000	1.20E+04	8.30E+03
15	40,000 <= nCi/g < 50,000	8.90E+03	6.20E+03
16	50,000 <= nCi/g < 60,000	6.40E+03	4.30E+03
17	60,000 <= nCi/g < 70,000	5.10E+03	3.40E+03
18	70,000 <= nCi/g < 80,000	4.50E+03	2.90E+03
19	80,000 <= nCi/g < 90,000	4.90E+03	3.30E+03
20	90,000 <= nCi/g < 100,000	3.10E+03	2.00E+03
21	100,000 <= nCi/g < 200,000	1.80E+04	1.20E+04
22	200,000 <= nCi/g < 300,000	3.60E+03	2.00E+03
23	300,000 <= nCi/g < 400,000	2.20E+02	7.20E+01
25	500,000 <= nCi/g < 600,000	8.20E+01	5.90E+01
26	600,000 <= nCi/g < 700,000	6.90E+01	4.70E+01
Totals		1.73E+05	1.19E+05

Alpha Activity Distribution

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	1.03E+02	4.12E-04	1.38E+06	2.47E-04	1.38E+06	5.88E-04	1.97E+06	3.53E-04	1.97E+06
PU-52	8.66E+04	1.59E-02	1.27E+06	6.68E+01	1.27E+06	3.15E-02	2.52E+06	1.32E+02	2.52E+06
U-235	8.80E+01	1.01E-03	0.00E+00	1.94E+00	1.94E+00	2.04E-03	0.00E+00	3.93E+00	3.93E+00
U-238	2.68E+02	1.99E-03	0.00E+00	6.68E-01	6.68E-01	2.89E-03	0.00E+00	9.70E-01	9.70E-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 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	
		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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-118T-376

A. IDENTIFICATION

INEL ID/Name: ID-EGG-118T FILTERS (TRU)

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): 2,512.38

Gross Mass (kg): 678,240.04

Drum Equivalents: 11,850.83

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-118T-490

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	68	DRUM	14.42	5,640.00	CWS FILTERS
	788	BOX	2,497.96	672,600.04	CWS FILTERS
Subtotal	856		2,512.38	678,240.04	

Total 856**2,512.38 m3****678,240.04 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			
D002	CORROSIVE	ACID			
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	2.00E+05	1.30E+05
2	500 <= nCi/g < 1,000	1.50E+05	1.00E+05
3	1,000 <= nCi/g < 2,000	1.50E+05	1.00E+05
4	2,000 <= nCi/g < 3,000	2.10E+04	1.40E+04
5	3,000 <= nCi/g < 4,000	2.00E+04	1.30E+04
6	4,000 <= nCi/g < 5,000	7.80E+03	5.20E+03
7	5,000 <= nCi/g < 6,000	1.30E+04	7.70E+03
8	6,000 <= nCi/g < 7,000	9.40E+03	6.60E+03
9	7,000 <= nCi/g < 8,000	9.70E+03	6.90E+03
10	8,000 <= nCi/g < 9,000	3.70E+03	2.60E+03
11	9,000 <= nCi/g < 10,000	2.30E+03	1.40E+03
12	10,000 <= nCi/g < 20,000	1.90E+04	1.20E+04
13	20,000 <= nCi/g < 30,000	8.90E+03	5.90E+03
14	30,000 <= nCi/g < 40,000	2.20E+03	1.40E+03
15	40,000 <= nCi/g < 50,000	1.90E+02	1.10E+02
19	80,000 <= nCi/g < 90,000	5.50E+01	2.50E+01
22	200,000 <= nCi/g < 300,000	7.30E+01	5.00E+01
Totals		6.17E+05	4.07E+05

Alpha Activity Distribution

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	1.80E+01	9.35E-05	3.13E+05	5.61E-05	3.13E+05	1.50E-04	5.03E+05	9.02E-05	5.03E+05
PU-52	1.64E+04	2.51E-03	2.01E+05	1.05E+01	2.01E+05	4.15E-03	3.31E+05	1.74E+01	3.31E+05
U-235	1.24E+02	1.55E-04	0.00E+00	2.98E-01	2.98E-01	2.40E-04	0.00E+00	4.61E-01	4.61E-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	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
	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 -	Polyethylene	5.6
		Polyvinyl Chloride (PVC)	1.4
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	2.0
	Misc. Combustibles -	Surgeons' Glove	
		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-118T FILTERS (TRU)

C. Code/Name: 805 ASBESTOS 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): 8.06

Gross Mass (kg): 2,500.00

Drum Equivalents: 38.00

Physical Form: SOLID

Physical Type: FILTERS, 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 primarily of HEPA filters of various sizes. The filter frames are usually pressed hardboard, but a limited number are metal. The filter media is asbestos. The waste stream may include limited amounts of other combustibles from content codes 803, 810, 813, 814, 825, or 832.

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. 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. Filters are packaged in 1-gallon plastic coated cardboard cartons, one or two filters per carton. Some individual filters are individually bagged inside the cartons. Each carton is individually bagged, assayed and contained in a sleeve bag with up to four other cartons. Up to eight sleeve bags will fit into a prepared drum. Drums were prepared and packed according to the usual post-1972 procedures.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-118T-805

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
38	DRUM	8.06	2,500.00	ASBESTOS FILTERS
Subtotal	38	8.06	2,500.00	

Total 38**8.06 m3****2,500.00 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			
D002	CORROSIVE	ACID			
D009	MERCURY	ELEMENTAL MERCURY CONTAMINATED WITH RADIOACTIVE MATERIALS	7439-97-6		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
13	20,000 <= nCi/g < 30,000	1.70E+02	1.00E+02
17	60,000 <= nCi/g < 70,000	4.80E+01	2.50E+01
22	200,000 <= nCi/g < 300,000	1.40E+02	9.30E+01
23	300,000 <= nCi/g < 400,000	3.60E+02	2.50E+02
24	400,000 <= nCi/g < 500,000	6.80E+01	4.50E+01
25	500,000 <= nCi/g < 600,000	1.30E+02	8.50E+01
26	600,000 <= nCi/g < 700,000	1.30E+02	8.40E+01
27	700,000 <= nCi/g < 800,000	7.70E+01	5.40E+01
28	800,000 <= nCi/g < 900,000	7.70E+01	5.40E+01
29	900,000 <= nCi/g < 1,000,000	8.80E+01	6.50E+01
30	1,000,000 <= nCi/g < 2,500,000	5.20E+02	3.60E+02
31	2,500,000 <= nCi/g < 5,000,000	5.50E+02	3.70E+02
32	5,000,000 <= nCi/g < 7,500,000	1.30E+02	6.10E+01
Totals		2.49E+03	1.65E+03

Alpha Activity Distribution

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	4.35E+02	1.83E-03	1.14E+05	1.52E-03	1.14E+05	3.13E-03	1.94E+05	2.60E-03	1.94E+05
PU-238	2.61E+02	1.01E-03	1.54E+07	7.43E+02	1.54E+07	1.73E-03	2.62E+07	1.27E+03	2.62E+07

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)	
		Ceramic (molds)	
	Misc. Non-Combustible -	Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	2.0
		Vermiculite	2.0
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	24.0
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na2O (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	5.6
		Polyvinyl Chloride (PVC)	1.4
		Teflon	0.0
		Plexiglass	
	Rubber -	Rubber	2.0
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	20.3
		Cardboard	6.8
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
COMBUSTIBLES			4-1
FILTERS (HEPA)			4-1
METAL (FILTER FRAMESS)			4-1
ORGANICS	14	LBS/FT3	4-1
OTHER (ASBESTOS FILTER MEDIA)			4-1
WOOD (FILTER FRAMSE PRESSED HARDBOARD)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-118T FILTERS (TRU)

C. Code/Name: 813 GLASS FILTERS AND FIBERGLASS

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): .64

Gross Mass (kg): 170.00

Drum Equivalents: 3.00

Physical Form: SOLID

Physical Type: FILTERS, 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 Mound Laboratory, consists primarily of spun glass filters and fiberglass glovebox prefilters. The waste may include limited amounts of other noncombustibles from content codes 803, 805, 810, 811, 813, 814, or 825.

The waste is certifiable (for WIPP) since free particulate should be limited. Gas generation should be negligible, since the organic content should be less than 14 lb/ft³. No sludges or free liquids should be present. No explosive, pyrophoric, or corrosive materials should be present.

The waste is contained in drums. Filters are packaged in 1-gallon plastic coated cardboard cartons. Each carton is individually bagged, assayed and contained in a sleeve bag with up to four other cartons. Up to eight sleeve bags will fit into a prepared drum. Drums were prepared and packed according to the usual post-1972 procedures.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-118T-813

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
3	DRUM	0.64	170.00	GLASS FILTERS AND FIBERGLASS
Subtotal	3	0.64	170.00	

Total 3**.64 m3****170.00 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			
D002	CORROSIVE	ACID			
D009	MERCURY	ELEMENTAL MERCURY CONTAMINATED WITH RADIOACTIVE MATERIALS	7439-97-6		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
25	500,000 <= nCi/g < 600,000	8.30E+01	6.00E+01
31	2,500,000 <= nCi/g < 5,000,000	8.30E+01	3.80E+01
Totals		1.66E+02	9.80E+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.

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	7.00E+01	8.43E-04	5.23E+04	6.99E-04	5.23E+04	1.76E-03	1.09E+05	1.46E-03	1.09E+05
PU-238	2.85E+01	3.43E-04	5.22E+06	2.52E+02	5.22E+06	7.29E-04	1.11E+07	5.35E+02	1.11E+07

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	2.0	
		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	4.0	
		Vermiculite		
		Salts		
		Filters/Insulation -	Glass Filter Media	84.0
	Asbestos (filter, insulation)			
	Filter Dust			
Magnesia (ir.sulations)				
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	4.0
			Polyvinyl Chloride (PVC)	1.0
			Teflon	0.0
Plexiglass				
Rubber -	Rubber			
	Surgeons' Glove			
Misc. Combustibles -	Graphite (molds)			
	Paper			
	Wood			
	Cardboard	5.0		
	Cloth			

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
FILTERS (SPUN GLASS AND FIBERGLASS)			4-1
ORGANICS	14	LB/FT3	4-1

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-119T-118

A. IDENTIFICATION

INEL ID/Name: ID-EGG-119T GLASS (TRU)

C. Code/Name: 118 CERTIFIED TRU GLASS WASTE

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

Discarded labware, windows, containers, and raschig rings.

Total Volume (m3): 169.09

Gross Mass (kg): 64,180.00

Drum Equivalents: 797.59

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-119T-118

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	35	DRUM	7.42	4,570.00	CERTIFIED TRU GLASS WASTE
	51	BOX	161.67	59,610.00	CERTIFIED TRU GLASS WASTE
Subtotal	86		169.09	64,180.00	

Total 86**169.09 m3****64,180.00 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			
D008	LEAD		7439-92-1		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.60E+03	1.40E+03
2	500 <= nCi/g < 1,000	2.50E+03	2.10E+03
3	1,000 <= nCi/g < 2,000	6.00E+03	4.70E+03
4	2,000 <= nCi/g < 3,000	1.30E+04	1.00E+04
5	3,000 <= nCi/g < 4,000	3.40E+03	2.70E+03
6	4,000 <= nCi/g < 5,000	4.70E+03	3.80E+03
7	5,000 <= nCi/g < 6,000	6.20E+03	5.10E+03
8	6,000 <= nCi/g < 7,000	3.80E+03	3.10E+03
9	7,000 <= nCi/g < 8,000	2.60E+03	2.10E+03
10	8,000 <= nCi/g < 9,000	4.60E+03	3.70E+03
11	9,000 <= nCi/g < 10,000	2.10E+03	1.70E+03
12	10,000 <= nCi/g < 20,000	1.10E+04	9.50E+03
13	20,000 <= nCi/g < 30,000	3.60E+03	2.90E+03
14	30,000 <= nCi/g < 40,000	1.10E+03	7.90E+02
15	40,000 <= nCi/g < 50,000	2.60E+02	2.00E+02
16	50,000 <= nCi/g < 60,000	9.40E+02	7.60E+02
17	60,000 <= nCi/g < 70,000	4.60E+02	3.70E+02
18	70,000 <= nCi/g < 80,000	1.90E+02	1.60E+02
20	90,000 <= nCi/g < 100,000	9.50E+01	6.50E+01
22	200,000 <= nCi/g < 300,000	8.20E+01	5.20E+01
Totals		6.82E+04	5.52E+04

Alpha Activity Distribution

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	1.82E+01	5.86E-05	1.96E+05	3.51E-05	1.96E+05	8.58E-05	2.87E+05	5.15E-05	2.87E+05
PU-52	7.31E+03	6.87E-03	5.48E+05	2.88E+01	5.48E+05	9.45E-03	7.54E+05	3.96E+01	7.54E+05
U-235	3.10E+01	1.94E-05	0.00E+00	3.74E-02	3.74E-02	2.56E-05	0.00E+00	4.92E-02	4.92E-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	1.2	
		Other Glass	87.7	
	Metals -	Carbon Steel		
		Stainless Steel		
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal	0.3	
		Lead (Bulk Pb)		
	Misc. Non-Combustible -	Other HVPM(Zn,Cd)	0.0	
		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 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	4.8
			Polyvinyl Chloride (PVC)	1.2
Tellon	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-119T GLASS (TRU)

C. Code/Name: 440 GLASS

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

Discarded labware, windows, containers, and raschig rings.

Total Volume (m3): 247.70

Gross Mass (kg): 107,930.01

Drum Equivalents: 1,168.39

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 Ooii-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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-119T-440

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	974	DRUM	206.49	96,100.01	GLASS
	13	BOX	41.21	11,830.00	GLASS
Subtotal	987		247.70	107,930.01	

Total 987**247.70 m3****107,930.01 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	ACID			
D008	LEAD		7439-92-1		
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		
D029	1,1-DICHLOROETHYLENE		75-35-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCug < 500	2.50E+03	2.10E+03
2	500 <= nCug < 1,000	1.20E+04	9.20E+03
3	1,000 <= nCug < 2,000	1.90E+04	1.40E+04
4	2,000 <= nCug < 3,000	1.50E+04	1.10E+04
5	3,000 <= nCug < 4,000	1.30E+04	9.20E+03
6	4,000 <= nCug < 5,000	7.50E+03	5.50E+03
7	5,000 <= nCug < 6,000	4.60E+03	3.30E+03
8	6,000 <= nCug < 7,000	6.00E+03	4.20E+03
9	7,000 <= nCug < 8,000	3.30E+03	2.50E+03
10	8,000 <= nCug < 9,000	3.50E+03	2.40E+03
11	9,000 <= nCug < 10,000	3.40E+03	2.50E+03
12	10,000 <= nCug < 20,000	1.20E+04	9.00E+03
13	20,000 <= nCug < 30,000	2.10E+03	1.60E+03
14	30,000 <= nCug < 40,000	1.50E+03	1.10E+03
15	40,000 <= nCug < 50,000	9.10E+02	6.90E+02
16	50,000 <= nCug < 60,000	6.50E+02	4.90E+02
17	60,000 <= nCug < 70,000	2.90E+02	2.00E+02
18	70,000 <= nCug < 80,000	2.00E+02	1.60E+02
19	80,000 <= nCug < 90,000	2.70E+02	2.00E+02
20	90,000 <= nCug < 100,000	9.00E+01	6.70E+01
21	100,000 <= nCug < 200,000	2.10E+02	1.60E+02
22	200,000 <= nCug < 300,000	1.00E+02	7.90E+01
Totals		1.08E+05	7.96E+04

Alpha Activity Distribution

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	1.12E+01	8.79E-05	2.94E+05	5.28E-05	2.94E+05	1.13E-04	3.78E+05	6.78E-05	3.78E+05
PU-52	9.26E+03	7.63E-03	6.08E+05	3.20E+01	6.08E+05	1.02E-02	8.14E+05	4.28E+01	8.14E+05
U-235	7.20E+01	3.91E-04	0.00E+00	7.53E-01	7.53E-01	5.62E-04	0.00E+00	1.08E+00	1.08E+00
U-238	3.20E+01	3.81E-04	0.00E+00	1.28E-01	1.28E-01	5.22E-04	0.00E+00	1.75E-01	1.75E-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)	
	Misc. Non-Combustible -	Other HVPM(Zn,Cd)	0.0
		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)	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
		Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
		Plastics -	
<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.
ABSORBENT (OIL-DRI)			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-119T GLASS (TRU)

C. Code/Name: 441 UNLEACHED RASHIG RINGS

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

Discarded labware, windows, containers, and rashig rings.

Total Volume (m3): 168.96

Gross Mass (kg): 72,000.00

Drum Equivalents: 797.00

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. 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 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 oi-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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-119T-441

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	797	DRUM	168.96	72,000.00	UNLEACHED RASHIG RINGS
Subtotal	797		168.96	72,000.00	

Total 797**168.96 m3****72,000.00 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			
D002	CORROSIVE	ACID			
D008	LEAD		7439-92-1		
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	5.10E+02	3.70E+02
2	500 <= nCi/g < 1,000	6.80E+03	5.10E+03
3	1,000 <= nCi/g < 2,000	1.00E+04	7.90E+03
4	2,000 <= nCi/g < 3,000	6.90E+03	5.20E+03
5	3,000 <= nCi/g < 4,000	4.50E+03	3.40E+03
6	4,000 <= nCi/g < 5,000	3.70E+03	2.70E+03
7	5,000 <= nCi/g < 6,000	2.90E+03	2.20E+03
8	6,000 <= nCi/g < 7,000	1.90E+03	1.40E+03
9	7,000 <= nCi/g < 8,000	1.90E+03	1.40E+03
10	8,000 <= nCi/g < 9,000	1.70E+03	1.20E+03
11	9,000 <= nCi/g < 10,000	1.40E+03	1.00E+03
12	10,000 <= nCi/g < 20,000	1.00E+04	7.70E+03
13	20,000 <= nCi/g < 30,000	8.00E+03	6.00E+03
14	30,000 <= nCi/g < 40,000	5.70E+03	4.20E+03
15	40,000 <= nCi/g < 50,000	2.80E+03	2.10E+03
16	50,000 <= nCi/g < 60,000	9.00E+02	6.50E+02
17	60,000 <= nCi/g < 70,000	1.10E+03	7.80E+02
18	70,000 <= nCi/g < 80,000	7.20E+01	4.90E+01
19	80,000 <= nCi/g < 90,000	5.10E+02	3.80E+02
20	90,000 <= nCi/g < 100,000	9.20E+01	6.90E+01
21	100,000 <= nCi/g < 200,000	5.40E+01	3.10E+01
Totals		7.14E+04	5.38E+04

Alpha Activity Distribution

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	6.00E-01	8.22E-08	2.75E+02	4.93E-08	2.75E+02	1.11E-07	3.72E+02	6.67E-08	3.72E+02
PU-52	1.25E+04	8.38E-03	6.69E+05	3.52E+01	6.69E+05	1.21E-02	9.63E+05	5.06E+01	9.63E+05

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)	
	Misc. Non-Combustible -	Ceramic (molds)	
		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 Na2O (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	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
<u>Combustibles</u> (>90% Combustible)			

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DRI)			4-1
B2O3	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-119T GLASS (TRU)

C. Code/Name: 442 LEACHED RASHIG RINGS

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

Discarded labware, windows, containers, and rashig rings.

Total Volume (m3): 199.46

Gross Mass (kg): 88,957.01

Drum Equivalents: 940.87

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 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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-119T-442

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
582	DRUM	123.38	53,757.00	LEACHED RASHIG RINGS
24	BOX	76.08	35,200.00	LEACHED RASHIG RINGS
Subtotal	606	199.46	88,957.01	

Total 606**199.46 m3****88,957.01 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	ACID			
D008	LEAD		7439-92-1		
D028	1,2-DICHLOROETHANE		107-06-2		
D029	1,1-DICHLOROETHYLENE		75-35-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	ACETONE	67-64-1		
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		
F005	SPENT NON-HALOGENATED SOLVENTS	BENZENE	71-43-2		
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	9.90E+03	8.10E+03
2	500 <= nCi/g < 1,000	1.30E+04	1.00E+04
3	1,000 <= nCi/g < 2,000	1.20E+04	9.10E+03
4	2,000 <= nCi/g < 3,000	8.10E+03	6.30E+03
5	3,000 <= nCi/g < 4,000	6.30E+03	4.80E+03
6	4,000 <= nCi/g < 5,000	5.00E+03	3.90E+03
7	5,000 <= nCi/g < 6,000	2.70E+03	2.00E+03
8	6,000 <= nCi/g < 7,000	3.80E+03	2.90E+03
9	7,000 <= nCi/g < 8,000	3.00E+03	2.40E+03
10	8,000 <= nCi/g < 9,000	2.80E+03	2.20E+03
11	9,000 <= nCi/g < 10,000	4.90E+03	3.90E+03
12	10,000 <= nCi/g < 20,000	1.20E+04	9.10E+03
13	20,000 <= nCi/g < 30,000	2.50E+03	1.90E+03
14	30,000 <= nCi/g < 40,000	1.30E+03	1.00E+03
15	40,000 <= nCi/g < 50,000	7.40E+02	5.60E+02
16	50,000 <= nCi/g < 60,000	6.10E+02	4.70E+02
17	60,000 <= nCi/g < 70,000	9.90E+01	7.60E+01
Totals		8.87E+04	6.87E+04

Alpha Activity Distribution

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	3.00E-01	1.85E-06	6.19E+03	1.11E-06	6.19E+03	2.59E-06	8.66E+03	1.55E-06	8.66E+03
PU-52	7.09E+03	3.62E-03	2.89E+05	1.52E+01	2.89E+05	4.67E-03	3.73E+05	1.96E+01	3.73E+05
U-235	3.80E+01	2.61E-05	0.00E+00	5.01E-02	5.01E-02	3.12E-05	0.00E+00	6.00E-02	6.00E-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	74.5
		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	5.1
		Vermiculite	5.5
		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	
		Leaded Rubber	
	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	3.7
		Polyvinyl Chloride (PVC)	0.9
		Teflon	0.0
		Plexiglass	
	Rubber -	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
B203	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-119T GLASS (TRU)

C. Code/Name: 810 GLASS, FLASKS, SAMPLE VIALS, ETC.

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

Discarded labware, windows, containers, and raschig rings.

Total Volume (m3): 2.76

Gross Mass (kg): 970.00

Drum Equivalents: 13.00

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:**

This waste stream, generated at Mound Laboratory, consists mostly of whole and broken glassware and glass sample vials. The majority of the glass is pyrex. Limited amounts of other noncombustibles, material similar to that in content codes 803, 805, 811, and 826 may be present. Gas generation should be negligible. Even though some of the glassware is broken, fines should not exceed WIPP-WAC limits for respirable or dispersed fines. No inorganic sludges, no explosive, pyrophoric, or corrosive materials should be in the waste.

Most of the glassware is broken into pieces about 1 inch in diameter to reduce total volume. The material is packaged into 1 or 2 quart metal cans with lids. Each can is assayed for plutonium content and then placed with up to 4 other cans into a sleeve bag, which is sealed with tape. Up to 5 sleeve bags are placed inside a drum. Each drum is lined with a 90-mil drum liner, which is lined with a PE drum bag. Plywood spacers are placed between the rigid liner lid and the drum lid.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-119T-810

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	13	DRUM	2.76	970.00	GLASS, FLASKS, SAMPLE VIALS, 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.

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		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
23	300,000 <= nCi/g < 400,000	3.10E+02	2.10E+02
24	400,000 <= nCi/g < 500,000	1.60E+02	1.10E+02
28	800,000 <= nCi/g < 900,000	7.70E+01	5.40E+01
30	1,000,000 <= nCi/g < 2,500,000	1.80E+02	1.30E+02
31	2,500,000 <= nCi/g < 5,000,000	2.10E+02	1.40E+02
32	5,000,000 <= nCi/g < 7,500,000	4.30E+01	2.00E+01
Totals		9.80E+02	6.64E+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	1.90E+02	1.62E-03	1.00E+05	1.34E-03	1.00E+05	2.79E-03	1.73E+05	2.32E-03	1.73E+05
PU-238	9.58E+01	8.06E-04	1.23E+07	5.92E+02	1.23E+07	1.41E-03	2.15E+07	1.04E+03	2.15E+07

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)		
	Misc. Non-Combustible -	Other HVPM(Zn,Cd)	0.0	
		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 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	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)			4-1
METAL (METAL CANS)			4-1

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INEL Waste Profile Sheet

TRUMW

ID-EGG-120T-123

A. IDENTIFICATION

INEL ID/Name: ID-EGG-120T GLOVEBOX GLOVES (TRU)

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): 63.60

Gross Mass (kg): 36,900.00

Drum Equivalents: 300.00

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 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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-120T-123

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	300	DRUM	63.60	36,900.00	CERTIFIED TRU LEADED RUBBER
Subtotal	300		63.60	36,900.00	

Total 300**63.60 m3****36,900.00 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)
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
2	500 <= nCi/g < 1,000	2.70E+02	1.80E+02
3	1,000 <= nCi/g < 2,000	1.60E+03	1.10E+03
4	2,000 <= nCi/g < 3,000	1.60E+03	1.20E+03
5	3,000 <= nCi/g < 4,000	2.30E+03	1.70E+03
6	4,000 <= nCi/g < 5,000	2.00E+03	1.50E+03
7	5,000 <= nCi/g < 6,000	1.70E+03	1.30E+03
8	6,000 <= nCi/g < 7,000	1.20E+03	9.70E+02
9	7,000 <= nCi/g < 8,000	2.90E+03	2.20E+03
10	8,000 <= nCi/g < 9,000	1.10E+03	8.40E+02
11	9,000 <= nCi/g < 10,000	1.30E+03	9.90E+02
12	10,000 <= nCi/g < 20,000	1.00E+04	7.80E+03
13	20,000 <= nCi/g < 30,000	6.30E+03	4.80E+03
14	30,000 <= nCi/g < 40,000	2.20E+03	1.70E+03
15	40,000 <= nCi/g < 50,000	7.60E+02	5.80E+02
16	50,000 <= nCi/g < 60,000	8.80E+02	6.40E+02
17	60,000 <= nCi/g < 70,000	9.60E+01	6.60E+01
18	70,000 <= nCi/g < 80,000	1.30E+02	1.00E+02
19	80,000 <= nCi/g < 90,000	1.60E+02	1.30E+02
Totals		3.65E+04	2.78E+04

Alpha Activity Distribution

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	1.49E-02	1.49E-07	4.99E+02	8.94E-08	4.99E+02	2.14E-07	7.16E+02	1.28E-07	7.16E+02
PU-52	7.25E+03	5.63E-03	4.49E+05	2.36E+01	4.49E+05	7.48E-03	5.97E+05	3.14E+01	5.97E+05

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			
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	90.2	
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelex/lead		
		Sheetrock		
	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.
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-120T GLOVEBOX GLOVES (TRU)

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): 160.23

Gross Mass (kg): 108,400.01

Drum Equivalents: 755.81

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-120T-339

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
696	DRUM	147.55	104,900.01	LEADED RUBBER GLOVES AND APRONS
4	BOX	12.68	3,500.00	LEADED RUBBER GLOVES AND APRONS
Subtotal	700	160.23	108,400.01	

Total 700**160.23 m3****108,400.01 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	RADIOACTIVE LEAD SOLIDS	64083-05-2		
D022	CHLOROFORM		67-66-3		
D028	1,2-DICHLOROETHANE		107-06-2		
D029	1,1-DICHLOROETHYLENE		75-35-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	ACETONE	67-64-1		
F003	SPENT NON-HALOGENATED SOLVENTS	ETHYL BENZENE	100-41-4		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		
F005	SPENT NON-HALOGENATED SOLVENTS	BENZENE	71-43-2		
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nC/g < 500	5.20E+02	4.60E+02
2	500 <= nC/g < 1,000	1.60E+03	1.40E+03
3	1,000 <= nC/g < 2,000	3.40E+03	2.90E+03
4	2,000 <= nC/g < 3,000	2.90E+03	2.50E+03
5	3,000 <= nC/g < 4,000	3.10E+03	2.60E+03
6	4,000 <= nC/g < 5,000	4.50E+03	3.90E+03
7	5,000 <= nC/g < 6,000	5.10E+03	4.40E+03
8	6,000 <= nC/g < 7,000	6.40E+03	5.60E+03
9	7,000 <= nC/g < 8,000	4.60E+03	4.00E+03
10	8,000 <= nC/g < 9,000	5.80E+03	5.00E+03
11	9,000 <= nC/g < 10,000	5.20E+03	4.50E+03
12	10,000 <= nC/g < 20,000	4.00E+04	3.40E+04
13	20,000 <= nC/g < 30,000	1.90E+04	1.60E+04
14	30,000 <= nC/g < 40,000	4.90E+03	3.90E+03
15	40,000 <= nC/g < 50,000	1.30E+03	1.00E+03
16	50,000 <= nC/g < 60,000	2.60E+02	1.90E+02
17	60,000 <= nC/g < 70,000	3.00E+02	2.50E+02
19	80,000 <= nC/g < 90,000	1.80E+02	1.30E+02
20	90,000 <= nC/g < 100,000	1.40E+02	1.20E+02
21	100,000 <= nC/g < 200,000	5.90E+02	4.30E+02
Totals		1.10E+05	9.33E+04

Alpha Activity Distribution

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	1.22E+01	7.33E-05	2.45E+05	4.40E-05	2.45E+05	9.81E-05	3.28E+05	5.89E-05	3.28E+05
PU-52	2.02E+04	5.40E-03	4.31E+05	2.27E+01	4.31E+05	6.94E-03	5.54E+05	2.91E+01	5.54E+05

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 Na2O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
		Leaded Rubber	90.2
	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		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-120T GLOVEBOX GLOVES (TRU)
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): 10.18

Gross Mass (kg): 8,380.00

Drum Equivalents: 48.00

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-120T-463

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
48	DRUM	10.18	8,380.00	LEADED RUBBER GLOVES AND APRONS
Subtotal	48	10.18	8,380.00	

Total 48**10.18 m3****8,380.00 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		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
3	1,000 <= nCi/g < 2,000	1.20E+03	8.90E+02
4	2,000 <= nCi/g < 3,000	2.00E+03	1.50E+03
5	3,000 <= nCi/g < 4,000	5.90E+02	4.80E+02
6	4,000 <= nCi/g < 5,000	7.60E+01	5.40E+01
7	5,000 <= nCi/g < 6,000	4.00E+02	3.30E+02
8	6,000 <= nCi/g < 7,000	7.20E+02	5.60E+02
9	7,000 <= nCi/g < 8,000	5.10E+02	3.90E+02
10	8,000 <= nCi/g < 9,000	2.20E+02	1.70E+02
11	9,000 <= nCi/g < 10,000	5.50E+02	4.30E+02
12	10,000 <= nCi/g < 20,000	2.00E+03	1.50E+03
13	20,000 <= nCi/g < 30,000	2.10E+02	1.70E+02
Totals		8.48E+03	6.47E+03

Alpha Activity Distribution

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	7.59E+02	1.08E-03	8.58E+04	4.51E+00	8.58E+04	1.37E-03	1.10E+05	5.76E+00	1.10E+05

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		
	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	90.2
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	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			4-1
RUBBER (LEADED GLOVES AND APRONS)			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-120T GLOVEBOX GLOVES (TRU)

C. Code/Name: 802 DRY BOX GLOVES AND O-RINGS

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): 25.65

Gross Mass (kg): 6,900.00

Drum Equivalents: 121.00

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 stream is generated at the Rocky Flats Plant. The waste consists of neoprene dry box (glovebox) gloves, neoprene O-rings, and lead-lined gloves. Limited amounts of waste from content codes 801, 804, and 812 may be included. The waste is packaged in the standard RFP fashion.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-120T-802

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	121	DRUM	25.65	6,900.00	DRY BOX GLOVES AND O-RINGS
Subtotal	121		25.65	6,900.00	

Total 121**25.65 m3****6,900.00 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)
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 ≤ nCi/g < 500	4.70E+02	3.30E+02
2	500 ≤ nCi/g < 1,000	9.70E+01	5.20E+01
5	3,000 ≤ nCi/g < 4,000	1.60E+02	1.10E+02
6	4,000 ≤ nCi/g < 5,000	1.90E+02	1.20E+02
7	5,000 ≤ nCi/g < 6,000	5.20E+01	2.90E+01
13	20,000 ≤ nCi/g < 30,000	6.30E+01	4.00E+01
14	30,000 ≤ nCi/g < 40,000	4.50E+01	2.20E+01
17	60,000 ≤ nCi/g < 70,000	4.80E+01	2.50E+01
20	90,000 ≤ nCi/g < 100,000	7.90E+01	5.60E+01
21	100,000 ≤ nCi/g < 200,000	7.40E+02	5.30E+02
22	200,000 ≤ nCi/g < 300,000	2.90E+03	1.70E+03
23	300,000 ≤ nCi/g < 400,000	1.70E+03	8.40E+02
24	400,000 ≤ nCi/g < 500,000	6.80E+01	4.50E+01
30	1,000,000 ≤ nCi/g < 2,500,000	2.20E+02	1.50E+02
31	2,500,000 ≤ nCi/g < 5,000,000	1.10E+02	6.70E+01
Totals		6.94E+03	4.12E+03

Alpha Activity Distribution

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-01	6.35E-06	2.13E+04	3.81E-06	2.13E+04	9.92E-06	3.32E+04	5.95E-06	3.32E+04
PU-239	2.89E+02	2.86E-03	1.77E+05	2.37E-03	1.77E+05	4.44E-03	2.75E+05	3.68E-03	2.75E+05
PU-238	1.47E+02	4.04E-04	6.14E+06	2.96E+02	6.14E+06	6.48E-04	9.85E+06	4.75E+02	9.85E+06
PU-240	1.70E+02	2.44E-03	5.53E+05	2.51E-01	5.53E+05	3.67E-03	8.31E+05	3.78E-01	8.31E+05

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	1.0
		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	
		Leaded Rubber	77.0
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	8.0
		Polyvinyl Chloride (PVC)	2.0
		Teflon	0.0
		Plexiglass	
<u>Combustibles</u> (>90% Combustible)	Rubber -	Rubber	8.0
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	2.0
		Cloth	1.0

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
OTHER (LEAD LINED GLOVES)			4-1
RUBBER (NEOPRENE GLOVES, O-RINGS)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-132T METALS (TRU)

C. Code/Name: 20

NONCOMPRESSIBLE, NONCOMBUSTIBLE

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

Waste consists of TRU 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): 106.00

Gross Mass (kg): 53,500.00

Drum Equivalents: 500.00

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-132T-20

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	500	DRUM	106.00	53,500.00	NONCOMPRESSIBLE, NONCOMBUSTIBLE
Subtotal	500		106.00	53,500.00	

Total 500**106.00 m3****53,500.00 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)
D002	CORROSIVE	ACID			
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
2	500 <= nCi/g < 1,000	1.00E+02	8.00E+01
4	2,000 <= nCi/g < 3,000	1.10E+02	9.00E+01
Totals		2.10E+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.

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	1.00E-01	8.89E-07	2.98E+03	5.33E-07	2.98E+03	1.11E-06	3.73E+03	6.68E-07	3.73E+03
PU-239	1.00E+00	9.76E-06	6.05E+02	8.09E-06	6.05E+02	1.25E-05	7.77E+02	1.04E-05	7.77E+02
U-233	6.00E+00	5.85E-05	0.00E+00	5.67E+02	5.67E+02	7.52E-05	0.00E+00	7.28E+02	7.28E+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	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-dn	
		Vermiculite	
		Salts	
<u>Partial Combustible</u> (10%-90% Combustible)	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	26.5
<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	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-132T METALS (TRU)

C. Code/Name: 117 CERTIFIED TRU METAL WASTE

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

Waste consists of TRU 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): 1,513.42

Gross Mass (kg): 621,860.04

Drum Equivalents: 7,138.78

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-132T-117

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
96	DRUM	20.35	9,860.00	CERTIFIED TRU METAL WASTE
471	BOX	1,493.07	612,000.04	CERTIFIED TRU METAL WASTE
Subtotal	567	1,513.42	621,860.04	

Total 567**1,513.42 m3****621,860.04 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		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
P015	BERYLLIUM DUST		7440-41-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.00E+05	8.60E+04
2	500 <= nCi/g < 1,000	6.30E+04	5.20E+04
3	1,000 <= nCi/g < 2,000	7.40E+04	6.10E+04
4	2,000 <= nCi/g < 3,000	4.20E+04	3.50E+04
5	3,000 <= nCi/g < 4,000	4.30E+04	3.60E+04
6	4,000 <= nCi/g < 5,000	4.00E+04	3.40E+04
7	5,000 <= nCi/g < 6,000	3.00E+04	2.50E+04
8	6,000 <= nCi/g < 7,000	2.40E+04	2.00E+04
9	7,000 <= nCi/g < 8,000	2.00E+04	1.70E+04
10	8,000 <= nCi/g < 9,000	3.70E+04	3.10E+04
11	9,000 <= nCi/g < 10,000	7.20E+03	6.10E+03
12	10,000 <= nCi/g < 20,000	1.20E+05	9.80E+04
13	20,000 <= nCi/g < 30,000	1.50E+04	1.20E+04
14	30,000 <= nCi/g < 40,000	2.50E+03	2.00E+03
15	40,000 <= nCi/g < 50,000	5.50E+02	3.60E+02
16	50,000 <= nCi/g < 60,000	3.00E+02	1.70E+02
17	60,000 <= nCi/g < 70,000	4.20E+02	2.70E+02
18	70,000 <= nCi/g < 80,000	1.70E+02	1.10E+02
19	80,000 <= nCi/g < 90,000	1.50E+02	8.40E+01
20	90,000 <= nCi/g < 100,000	7.80E+01	4.80E+01
21	100,000 <= nCi/g < 200,000	1.50E+03	9.20E+02
22	200,000 <= nCi/g < 300,000	8.20E+01	5.20E+01
Totals		6.21E+05	5.17E+05

Alpha Activity Distribution

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	5.36E+01	5.10E-05	1.71E+05	3.06E-05	1.71E+05	7.65E-05	2.56E+05	4.59E-05	2.56E+05
PU-52	4.56E+04	9.56E-03	7.62E+05	4.01E+01	7.62E+05	1.50E-02	1.20E+06	6.28E+01	1.20E+06
U-235	2.50E+02	5.59E-05	0.00E+00	1.07E-01	1.07E-01	6.67E-05	0.00E+00	1.28E-01	1.28E-01
U-238	2.00E+00	1.82E-06	0.00E+00	6.11E-04	6.11E-04	2.27E-06	0.00E+00	7.62E-04	7.62E-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	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	
	Partially Combustible -	Leaded Rubber	
<u>Partial Combustible</u> (10%-90% Combustible)		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.
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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-132T-320

A. IDENTIFICATION

INEL ID/Name: ID-EGG-132T METALS (TRU)

C. Code/Name: 320 TANTALUM

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

Waste consists of TRU 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): 74.60

Gross Mass (kg): 29,400.00

Drum Equivalents: 351.91

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-132T-320

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
322	DRUM	68.26	27,300.00	TANTALUM
2	BOX	6.34	2,100.00	TANTALUM
Subtotal	324	74.60	29,400.00	

Total 324**74.60 m3****29,400.00 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		7439-92-1		
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	2.40E+02	2.20E+02
2	500 <= nCi/g < 1,000	1.90E+03	1.60E+03
3	1,000 <= nCi/g < 2,000	1.70E+03	1.30E+03
4	2,000 <= nCi/g < 3,000	8.10E+02	6.70E+02
5	3,000 <= nCi/g < 4,000	5.90E+02	4.80E+02
6	4,000 <= nCi/g < 5,000	6.10E+02	4.70E+02
7	5,000 <= nCi/g < 6,000	2.80E+02	2.10E+02
8	6,000 <= nCi/g < 7,000	5.50E+02	4.30E+02
9	7,000 <= nCi/g < 8,000	1.00E+02	7.70E+01
10	8,000 <= nCi/g < 9,000	4.10E+02	3.40E+02
11	9,000 <= nCi/g < 10,000	1.40E+02	1.20E+02
12	10,000 <= nCi/g < 20,000	3.00E+03	2.20E+03
13	20,000 <= nCi/g < 30,000	3.70E+03	2.60E+03
14	30,000 <= nCi/g < 40,000	2.40E+03	1.70E+03
15	40,000 <= nCi/g < 50,000	1.90E+03	1.30E+03
16	50,000 <= nCi/g < 60,000	1.60E+03	1.10E+03
17	60,000 <= nCi/g < 70,000	2.30E+03	1.70E+03
18	70,000 <= nCi/g < 80,000	2.00E+03	1.40E+03
19	80,000 <= nCi/g < 90,000	1.50E+03	1.00E+03
20	90,000 <= nCi/g < 100,000	8.40E+02	6.20E+02
21	100,000 <= nCi/g < 200,000	2.80E+03	2.00E+03
22	200,000 <= nCi/g < 300,000	3.10E+02	2.20E+02
Totals		2.97E+04	2.18E+04

Alpha Activity Distribution

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.

AIM

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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)
AM-241	2.67E+01	6.50E-05	2.17E+05	3.90E-05	2.17E+05	9.18E-05	3.07E+05	5.50E-05	3.07E+05
PU-52	1.58E+04	8.81E-03	7.03E+05	3.69E+01	7.03E+05	1.23E-02	9.82E+05	5.16E+01	9.82E+05

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	
	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	
	Plastics -	Polyethylene	3.7
		Polyvinyl Chloride (PVC)	0.9
		Teflon	0.0
	Plexiglass	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-132T METALS (TRU)

C. Code/Name: 480 NON-SPECIAL SOURCE METAL

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

Waste consists of TRU 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): 5,243.44

Gross Mass (kg): 2,387,960.16

Drum Equivalents: 24,733.19

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, fumaces, 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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-132T-480

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	1018	DRUM	215.82	109,960.01	NON-SPECIAL SOURCE METAL
	1586	BOX	5,027.62	2,278,000.15	NON-SPECIAL SOURCE METAL
Subtotal	2604		5,243.44	2,387,960.16	

Total 2,604**5,243.44 m3****2,387,960.16 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		
D028	1,2-DICHLOROETHANE		107-06-2		
D029	1,1-DICHLOROETHYLENE		75-35-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	ACETONE	67-64-1		
F003	SPENT NON-HALOGENATED SOLVENTS	ETHYL BENZENE	100-41-4		
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		
F005	SPENT NON-HALOGENATED SOLVENTS	BENZENE	71-43-2		
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCvg < 500	6.40E+05	5.40E+05
2	500 <= nCvg < 1,000	8.50E+05	6.80E+05
3	1,000 <= nCvg < 2,000	2.90E+05	2.20E+05
4	2,000 <= nCvg < 3,000	1.00E+05	8.00E+04
5	3,000 <= nCvg < 4,000	8.00E+04	6.30E+04
6	4,000 <= nCvg < 5,000	4.60E+04	3.60E+04
7	5,000 <= nCvg < 6,000	5.10E+04	3.90E+04
8	6,000 <= nCvg < 7,000	2.10E+04	1.60E+04
9	7,000 <= nCvg < 8,000	2.80E+04	2.10E+04
10	8,000 <= nCvg < 9,000	1.10E+04	8.50E+03
11	9,000 <= nCvg < 10,000	2.00E+04	1.50E+04
12	10,000 <= nCvg < 20,000	9.30E+04	7.10E+04
13	20,000 <= nCvg < 30,000	2.50E+04	1.90E+04
14	30,000 <= nCvg < 40,000	5.80E+03	4.30E+03
15	40,000 <= nCvg < 50,000	1.20E+03	9.20E+02
16	50,000 <= nCvg < 60,000	1.10E+03	8.40E+02
17	60,000 <= nCvg < 70,000	4.70E+02	3.80E+02
18	70,000 <= nCvg < 80,000	1.10E+02	8.70E+01
21	100,000 <= nCvg < 200,000	2.10E+02	1.70E+02
22	200,000 <= nCvg < 300,000	9.30E+01	7.00E+01
Totals		2.26E+06	1.82E+06

Alpha Activity Distribution

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	3.73E+01	1.03E-04	3.43E+05	6.16E-05	3.43E+05	1.33E-04	4.47E+05	8.01E-05	4.47E+05
NP-237	2.20E+01	2.20E-05	1.55E+01	6.65E-04	1.55E+01	3.06E-05	2.16E+01	9.25E-04	2.16E+01
PU-52	6.32E+04	4.97E-03	3.96E+05	2.08E+01	3.97E+05	6.37E-03	5.08E+05	2.67E+01	5.08E+05
U-235	2.61E+02	9.15E-05	0.00E+00	1.76E-01	1.76E-01	1.15E-04	0.00E+00	2.21E-01	2.21E-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	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 -	Ceramic (molds)	0.6
		Firebrick	
		Concrete	0.1
		Portland Cement	
		Dirt/Soil	0.6
		Ash	
		Oil-dn	0.9
		Vermiculite	0.3
		Salts	
	Filters/Insulation -	Glass Filter Media	0.6
		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	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	0.1
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	2.8
		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-132T METALS (TRU)

C. Code/Name: 481 LEACHED NONSPECIAL SOURCE METAL

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

Waste consists of TRU 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): 443.21

Gross Mass (kg): 214,400.01

Drum Equivalents: 2,090.61

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 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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-132T-481

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
700	DRUM	148.40	94,900.01	LEACHED NONSPECIAL SOURCE METAL
93	BOX	294.81	119,500.01	LEACHED NONSPECIAL SOURCE METAL
Subtotal	793	443.21	214,400.01	

Total 793**443.21 m3****214,400.01 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		
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		
D022	CHLOROFORM		67-66-3		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCvg < 500	2.10E+04	1.60E+04
2	500 <= nCvg < 1,000	2.30E+04	1.80E+04
3	1,000 <= nCvg < 2,000	2.10E+04	1.70E+04
4	2,000 <= nCvg < 3,000	1.30E+04	1.00E+04
5	3,000 <= nCvg < 4,000	1.10E+04	9.00E+03
6	4,000 <= nCvg < 5,000	1.10E+04	8.80E+03
7	5,000 <= nCvg < 6,000	9.10E+03	7.30E+03
8	6,000 <= nCvg < 7,000	8.50E+03	6.80E+03
9	7,000 <= nCvg < 8,000	9.50E+03	7.80E+03
10	8,000 <= nCvg < 9,000	8.80E+03	7.00E+03
11	9,000 <= nCvg < 10,000	8.50E+03	7.00E+03
12	10,000 <= nCvg < 20,000	4.40E+04	3.60E+04
13	20,000 <= nCvg < 30,000	1.60E+04	1.30E+04
14	30,000 <= nCvg < 40,000	7.00E+03	5.80E+03
15	40,000 <= nCvg < 50,000	2.30E+03	1.90E+03
16	50,000 <= nCvg < 60,000	4.90E+02	4.00E+02
17	60,000 <= nCvg < 70,000	3.50E+02	2.80E+02
19	80,000 <= nCvg < 90,000	1.30E+02	1.00E+02
Totals		2.15E+05	1.72E+05

Alpha Activity Distribution

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	9.50E-00	3.42E-05	1.14E+05	2.05E-05	1.14E+05	4.24E-05	1.42E+05	2.54E-05	1.42E+05
PU-52	2.35E+04	3.42E-03	2.73E+05	1.43E+01	2.73E+05	4.18E-03	3.34E+05	1.76E+01	3.34E+05
U-235	4.05E+02	1.97E-04	0.00E+00	3.78E-01	3.78E-01	2.47E-04	0.00E+00	4.76E-01	4.76E-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	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	
	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.
METAL (EQUIPMENT PIECES, TOOLS, ETC.)			4-1
OTHER (SMALL PIECES OF DESKS ETC.)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-132T METALS (TRU)

C. Code/Name: 803 METAL, EQUIPMENT, PIPES, VALVES, ETC.

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

Waste consists of TRU 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): 35.40

Gross Mass (kg): 12,326.00

Drum Equivalents: 167.00

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-132T-803

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	167	DRUM	35.40	12,326.00	METAL, EQUIPMENT, PIPES, VALVES, ETC.
Subtotal	167		35.40	12,326.00	

Total 167**35.40 m3****12,326.00 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		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.40E+02	9.40E+01
5	3,000 <= nCi/g < 4,000	8.40E+01	6.10E+01
12	10,000 <= nCi/g < 20,000	1.20E+02	9.70E+01
13	20,000 <= nCi/g < 30,000	5.50E+01	3.20E+01
22	200,000 <= nCi/g < 300,000	1.10E+02	8.40E+01
23	300,000 <= nCi/g < 400,000	5.50E+02	3.90E+02
24	400,000 <= nCi/g < 500,000	1.10E+03	8.20E+02
25	500,000 <= nCi/g < 600,000	7.20E+02	5.20E+02
26	600,000 <= nCi/g < 700,000	5.40E+02	3.80E+02
27	700,000 <= nCi/g < 800,000	8.50E+02	6.00E+02
28	70,000 <= nCi/g < 900,000	2.10E+02	1.40E+02
29	900,000 <= nCi/g < 1,000,000	2.90E+02	2.00E+02
30	1,000,000 <= nCi/g < 2,500,000	4.40E+03	3.20E+03
31	2,500,000 <= nCi/g < 5,000,000	3.20E+03	1.90E+03
32	5,000,000 <= nCi/g < 7,500,000	2.30E+02	1.10E+02
Totals		1.26E+04	8.63E+03

Alpha Activity Distribution

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-01	1.19E-06	3.98E+03	7.14E-07	3.98E+03	1.63E-06	5.46E+03	9.79E-07	5.46E+03
PU-239	2.71E+03	1.79E-03	1.11E+05	1.49E-03	1.11E+05	2.97E-03	1.84E+05	2.47E-03	1.84E+05
PU-238	1.42E+03	1.01E-03	1.54E+07	7.43E+02	1.54E+07	1.69E-03	2.57E+07	1.24E+03	2.57E+07
PU-83	6.58E+01	2.63E-04	3.35E+06	1.83E+02	3.35E+06	5.12E-04	6.52E+06	3.56E+02	6.52E+06

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
		Dir/Soil	
		Ash	
		Oil-dn	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	
	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.
MERCURY			4-1
METAL (STAINLESS STEEL, CARBON STEEL, ALUMINUM)			4-1
RESINS (ION EXCHANGE RESIN)			4-1

A. IDENTIFICATION

INEL ID Name: ID-EGG-134T MISCELLANEOUS(PAPER,METAL, ETC.) (TRU)

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): 770.09

Gross Mass (kg): 235,660.02

Drum Equivalents: 3,632.52

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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-134T-100

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
2	DRUM	0.42	120.00	GENERAL PLANT WASTE
1	BOX	3.17	1,000.00	GENERAL PLANT WASTE
219	BIN	766.50	234,540.02	GENERAL PLANT WASTE
Subtotal	222	770.09	235,660.02	

Total 222**770.09 m3****235,660.02 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			
F003	SPENT NON-HALOGENATED SOLVENTS	ETHYL ETHER	60-29-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	5.80E+03	4.20E+03
2	500 <= nCi/g < 1,000	5.40E+03	3.90E+03
3	1,000 <= nCi/g < 2,000	2.40E+04	1.80E+04
4	2,000 <= nCi/g < 3,000	3.10E+04	2.10E+04
5	3,000 <= nCi/g < 4,000	1.10E+04	6.40E+03
6	4,000 <= nCi/g < 5,000	2.30E+03	1.70E+03
12	10,000 <= nCi/g < 20,000	3.70E+03	2.80E+03
13	20,000 <= nCi/g < 30,000	6.50E+03	4.60E+03
21	100,000 <= nCi/g < 200,000	8.60E+02	5.60E+02
Totals		9.06E+04	6.32E+04

Alpha Activity Distribution

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	4.52E+01	5.22E-05	1.75E+05	3.13E-05	1.75E+05	8.07E-05	2.70E+05	4.84E-05	2.70E+05
NP-237	3.02E+01	3.02E-05	2.13E+01	9.12E-04	2.13E+01	4.36E-05	3.07E+01	1.32E-03	3.07E+01
PU-239	1.04E+03	1.82E-04	1.13E+04	1.51E-04	1.13E+04	2.48E-04	1.54E+04	2.06E-04	1.54E+04
PU-240	1.27E+03	1.84E-04	4.17E+04	1.89E-02	4.17E+04	2.55E-04	5.78E+04	2.63E-02	5.78E+04
U-235	3.35E+01	1.43E-05	0.00E+00	2.74E-02	2.74E-02	1.93E-05	0.00E+00	3.71E-02	3.71E-02
U-238	8.51E+02	6.43E-04	0.00E+00	2.16E-01	2.16E-01	9.21E-04	0.00E+00	3.09E-01	3.09E-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	
	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	5.0
		Cardboard	
		Cloth	
<u>Partial Combustible</u> (10%-90% Combustible)			
<u>Combustibles</u> (>90% Combustible)			

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. IDENTIFICATION

INEL ID/Name: ID-EGG-134T MISCELLANEOUS(PAPER,METAL, ETC.) (TRU)

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): 211.85

Gross Mass (kg): 71,950.00

Drum Equivalents: 999.29

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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-134T-101

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
5	BOX	15.85	6,800.00	CUT UP GLOVEBOXES
56	BIN	196.00	65,150.00	CUT UP GLOVEBOXES
Subtotal	61	211.85	71,950.00	

Total 61**211.85 m3****71,950.00 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 constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.30E+04	9.10E+03
2	500 <= nCi/g < 1,000	6.00E+03	4.40E+03
3	1,000 <= nCi/g < 2,000	1.30E+04	1.00E+04
4	2,000 <= nCi/g < 3,000	1.10E+04	8.30E+03
10	8,000 <= nCi/g < 9,000	1.10E+03	7.90E+02
11	9,000 <= nCi/g < 10,000	1.30E+03	9.60E+02
12	10,000 <= nCi/g < 20,000	2.20E+03	1.60E+03
13	20,000 <= nCi/g < 30,000	8.80E+03	6.30E+03
20	90,000 <= nCi/g < 100,000	2.70E+03	2.10E+03
Totals		5.91E+04	4.36E+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	1.00E-01	3.67E-08	1.23E+02	2.20E-08	1.23E+02	4.73E-08	1.58E+02	2.84E-08	1.58E+02
NP-237	1.94E+02	2.17E-04	1.53E+02	6.56E-03	1.53E+02	3.32E-04	2.34E+02	1.00E-02	2.34E+02
PU-239	7.23E+02	1.66E-04	1.03E+04	1.38E-04	1.03E+04	2.22E-04	1.38E+04	1.84E-04	1.38E+04
PU-241	4.80E-01	4.80E-07	8.35E+02	5.79E-01	8.35E+02	6.92E-07	1.20E+03	8.35E-01	1.20E+03
PU-240	2.35E+03	6.52E-04	1.48E+05	6.71E-02	1.48E+05	8.63E-04	1.95E+05	8.89E-02	1.95E+05
U-235	1.00E+00	7.87E-07	0.00E+00	1.51E-03	1.51E-03	1.04E-06	0.00E+00	2.00E-03	2.00E-03
U-238	3.06E+04	2.43E-02	0.00E+00	8.17E+00	8.17E+00	3.24E-02	0.00E+00	1.09E+01	1.09E+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	10.0	
	Metals -	Carbon Steel	5.0	
		Stainless Steel	74.9	
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal	0.1	
	Misc. Non-Combustible -	Lead (Bulk Pb)		
		Other HVPM(Zn,Cd)	0.0	
		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)			
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Aqueous Solutions		
		Leaded Rubber		
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelex/leao		
		Sheetrock		
		Plastics -	Polyethylene	1.6
			Polyvinyl Chloride (PVC)	0.4
Teflon	0.0			
Plexiglass				
Rubber -	Rubber			
	Surgeons' Glove			
<u>Combustibles</u> {>90% Combustible)	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)			4-1, 2
ORGANICS	3	LB/FT3	4-1
OTHER (GLOVEBOX SECTIONS)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-134T MISCELLANEOUS(PAPER,METAL, ETC.) (TRU)
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): 25.36

Gross Mass (kg): 11,000.00

Drum Equivalents: 119.62

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 it may contain F-listed wastes.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-134T-121

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	8	BOX	25.36	11,000.00	WIPP PRECERTIFIED DDW NONCOMBUSTIBLE SOLIDS
Subtotal	8		25.36	11,000.00	

Total	8	25.36 m3	11,000.00 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)
D004	ARSENIC	.	7440-38-2		
D005	BARIUM	.	7440-39-3		
D006	CADMIUM	.	7440-43-9		
D007	CHROMIUM	.	7440-47-32		
D008	LEAD	.	7439-92-1		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
P015	BERYLLIUM DUST	.	7440-41-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
12	10,000 <= nCvg < 20,000	1.10E+04	8.20E+03
Totals		1.10E+04	8.20E+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.

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	3.45E+00	3.22E-07	1.08E+03	1.93E-07	1.08E+03	4.18E-07	1.40E+03	2.51E-07	1.40E+03
PU-239	2.41E+03	2.25E-04	1.40E+04	1.87E-04	1.40E+04	2.92E-04	1.81E+04	2.42E-04	1.81E+04

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INEL Waste Profile Sheet

TRUMW

ID-EGG-134T-121

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-134T MISCELLANEOUS(PAPER,METAL, ETC.) (TRU)

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): 64.90

Gross Mass (kg): 25,010.00

Drum Equivalents: 306.15

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.

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-134T-201

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
16	BIN	56.00	19,000.00	NONCOMBUSTIBLE SOLIDS
42	DRUM	8.90	6,010.00	NONCOMBUSTIBLE SOLIDS
Subtotal	58	64.90	25,010.00	

Total 58**64.90 m3****25,010.00 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		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.60E+04	1.20E+04
2	500 <= nCi/g < 1,000	1.70E+03	1.30E+03
3	1,000 <= nCi/g < 2,000	3.70E+02	3.20E+02
4	2,000 <= nCi/g < 3,000	2.70E+02	2.30E+02
5	3,000 <= nCi/g < 4,000	1.90E+02	1.70E+02
6	4,000 <= nCi/g < 5,000	4.50E+02	3.60E+02
7	5,000 <= nCi/g < 6,000	5.00E+02	4.40E+02
8	6,000 <= nCi/g < 7,000	2.80E+02	2.30E+02
9	7,000 <= nCi/g < 8,000	9.70E+01	7.40E+01
10	8,000 <= nCi/g < 9,000	9.30E+01	7.00E+01
Totals		2.00E+04	1.52E+04

Alpha Activity Distribution

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	2.40E+02	6.62E-04	4.10E+04	5.49E-04	4.10E+04	8.19E-04	5.08E+04	6.79E-04	5.08E+04
U-235	2.33E+03	3.51E-03	0.00E+00	6.74E+00	6.74E+00	4.25E-03	0.00E+00	8.17E+00	8.17E+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	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
		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	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-134T MISCELLANEOUS(PAPER,METAL, ETC.) (TRU)

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): 1.06

Gross Mass (kg): 830.00

Drum Equivalents: 5.00

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-134T-241

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
5	DRUM	1.06	830.00	AMERICIUM PROCESS RESIDUE
Subtotal	5	1.06	830.00	

Total 5**1.06 m3****830.00 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			
D002	CORROSIVE	ACID			
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
2	500 <= nCi/g < 1,000	1.30E+02	1.00E+02
3	1,000 <= nCi/g < 2,000	1.60E+02	1.10E+02
4	2,000 <= nCi/g < 3,000	1.60E+02	1.40E+02
6	4,000 <= nCi/g < 5,000	1.90E+02	1.70E+02
16	50,000 <= nCi/g < 60,000	2.00E+02	1.50E+02
Totals		8.40E+02	6.70E+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.

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-52	1.50E+02	7.68E-04	6.13E+04	3.22E+00	6.13E+04	9.86E-04	7.86E+04	4.13E+00	7.86E+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	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	13.4
		Lead (Bulk Pb)	46.5
		Other HVPM (Zn, Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	4.1
		Vermiculite	
		Salts	
		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)	
<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	24.7
		Polyvinyl Chloride (PVC)	6.1
		Teflon	0.0
		Plexiglass	
<u>Combustibles</u> (>90% Combustible)	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.
CLOTHING (LEADED GLOVES)			4-1, 2
GLASS (GLASSWARE)			4-1, 2
OTHER (EQUIPMENT, PIPING, FLANGES, VALVES)			4-1, 2
PAPER			4-1, 2
PLASTIC (PVC PIPING, PE BOTTLES)			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-134T MISCELLANEOUS(PAPER,METAL, ETC.) (TRU)

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): 370.89

Gross Mass (kg): 134,630.01

Drum Equivalents: 1,749.48

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 generattly 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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-134T-824

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
117	BOX	370.89	134,630.01	NONCOMBUSTIBLE EQUIPMENT BOXES
Subtotal	117	370.89	134,630.01	

Total 117**370.89 m3****134,630.01 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)
D005	BARIUM	.	7440-39-3		
D006	CADMIUM	.	7440-43-9		
D007	CHROMIUM	.	7440-47-32		
D008	LEAD	.	7439-92-1		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		
D010	SELENIUM	.	7782-49-2		
D011	SILVER	.	7440-22-4		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
2	500 <= nCi/g < 1,000	2.40E+04	2.20E+04
3	1,000 <= nCi/g < 2,000	8.80E+04	7.80E+04
4	2,000 <= nCi/g < 3,000	2.90E+04	2.70E+04
5	3,000 <= nCi/g < 4,000	2.50E+04	2.30E+04
6	4,000 <= nCi/g < 5,000	2.20E+04	2.10E+04
7	5,000 <= nCi/g < 6,000	8.00E+03	7.40E+03
8	6,000 <= nCi/g < 7,000	1.40E+04	1.30E+04
9	7,000 <= nCi/g < 8,000	2.40E+04	2.00E+04
10	8,000 <= nCi/g < 9,000	1.40E+04	1.30E+04
11	9,000 <= nCi/g < 10,000	8.40E+03	7.60E+03
12	10,000 <= nCi/g < 20,000	5.60E+04	4.50E+04
13	20,000 <= nCi/g < 30,000	1.30E+04	1.20E+04
14	30,000 <= nCi/g < 40,000	1.80E+04	1.70E+04
15	40,000 <= nCi/g < 50,000	1.20E+04	1.10E+04
16	50,000 <= nCi/g < 60,000	4.10E+03	3.50E+03
17	60,000 <= nCi/g < 70,000	1.10E+03	1.10E+03
18	70,000 <= nCi/g < 80,000	5.40E+02	2.60E+02
19	80,000 <= nCi/g < 90,000	4.60E+02	1.80E+02
20	90,000 <= nCi/g < 100,000	3.40E+03	3.10E+03
21	100,000 <= nCi/g < 200,000	5.70E+03	4.80E+03
22	200,000 <= nCi/g < 300,000	3.80E+03	3.20E+03
23	300,000 <= nCi/g < 400,000	3.70E+03	2.00E+03
24	400,000 <= nCi/g < 500,000	4.60E+03	3.10E+03
25	500,000 <= nCi/g < 600,000	5.70E+03	1.80E+03
26	600,000 <= nCi/g < 700,000	5.90E+02	3.10E+02
27	700,000 <= nCi/g < 800,000	4.30E+02	1.50E+02
28	800,000 <= nCi/g < 900,000	7.10E+02	4.20E+02
29	900,000 <= nCi/g < 1,000,000	5.80E+02	3.00E+02
30	1,000,000 <= nCi/g < 2,500,000	7.30E+02	1.70E+02
Totals		3.92E+05	3.41E+05

Alpha Activity Distribution

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	1.28E+03	5.47E-04	3.39E+04	4.53E-04	3.39E+04	1.44E-03	8.95E+04	1.20E-03	8.95E+04
PU-238	9.51E+02	4.35E-04	6.62E+06	3.20E+02	6.62E+06	1.07E-03	1.62E+07	7.83E+02	1.62E+07
PU-83	9.09E+00	5.00E-06	6.36E+04	3.47E+00	6.36E+04	6.90E-06	8.77E+04	4.79E+00	8.77E+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	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	
		Benslex/lead	
		Sheetrock	26.5
<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	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 (FLOOR TILE, POLYURETHANE FOAM)			4-1
PLASTIC (TANKS, PLEXIGLASS, CONTAMINATION TENTS)			4-1
RESINS (UNKNOWN)			4-1

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-134T-824

A. IDENTIFICATIONINEL ID/Name: **ID-EGG-134T** MISCELLANEOUS(PAPER,METAL, ETC.) (TRU)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): 13.95

Gross Mass (kg): 5,450.00

Drum Equivalents: 65.81

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 waste 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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-134T-950

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	6	DRUM	1.27	610.00	LSA METAL, GLASS, ETC.
	4	BOX	12.68	4,840.00	LSA METAL, GLASS, ETC.
Subtotal	10		13.95	5,450.00	

Total 10**13.95 m3****5,450.00 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 constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	2.50E+03	2.20E+03
2	500 <= nCi/g < 1,000	4.00E+03	3.10E+03
3	1,000 <= nCi/g < 2,000	1.30E+02	1.10E+02
Totals		6.63E+03	5.41E+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.

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-52	5.60E+01	3.76E-05	3.00E+03	1.58E-01	3.00E+03	4.57E-05	3.64E+03	1.92E-01	3.64E+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	
		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
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	0.3
		Polyvinyl Chloride (PVC)	0.1
		Tellon	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-DRI)			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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-137T-300

A. IDENTIFICATION

INEL ID/Name: ID-EGG-137T NONMETAL MOLDS AND CRUCIBLES (TRU)

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): 391.78

Gross Mass (kg): 204,800.01

Drum Equivalents: 1,848.00

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-137T-300

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	1848	DRUM	391.78	204,800.01	GRAPHITE
Subtotal	1848		391.78	204,800.01	

Total 1,848**391.78 m3****204,800.01 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)
D022	CHLOROFORM		67-66-3		
D028	1,2-DICHLOROETHANE		107-06-2		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETPACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		
F005	SPENT NON-HALOGENATED SOLVENTS	BENZENE	71-43-2		
F005	SPENT NON-HALOGENATED SOLVENTS	TOLUENE	108-88-3		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
2	500 <= nCi/g < 1,000	8.00E+03	6.40E+03
3	1,000 <= nCi/g < 2,000	1.80E+04	1.50E+04
4	2,000 <= nCi/g < 3,000	2.10E+04	1.70E+04
5	3,000 <= nCi/g < 4,000	1.80E+04	1.50E+04
6	4,000 <= nCi/g < 5,000	1.30E+04	1.00E+04
7	5,000 <= nCi/g < 6,000	1.20E+04	9.10E+03
8	6,000 <= nCi/g < 7,000	9.70E+03	7.70E+03
9	7,000 <= nCi/g < 8,000	8.60E+03	6.70E+03
10	8,000 <= nCi/g < 9,000	9.50E+03	7.40E+03
11	9,000 <= nCi/g < 10,000	7.50E+03	5.90E+03
12	10,000 <= nCi/g < 20,000	4.90E+04	3.80E+04
13	20,000 <= nCi/g < 30,000	2.10E+04	1.70E+04
14	30,000 <= nCi/g < 40,000	6.50E+03	5.10E+03
15	40,000 <= nCi/g < 50,000	2.40E+03	1.80E+03
16	50,000 <= nCi/g < 60,000	4.10E+02	3.20E+02
17	60,000 <= nCi/g < 70,000	4.40E+02	3.20E+02
21	100,000 <= nCi/g < 200,000	7.30E+01	5.00E+01
22	200,000 <= nCi/g < 300,000	1.10E+02	8.70E+01
Totals		2.05E+05	1.63E+05

Alpha Activity Distribution

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	1.69E+01	8.53E-05	2.85E+05	5.12E-05	2.85E+05	1.09E-04	3.64E+05	6.52E-05	3.64E+05
PU-52	2.64E+04	5.61E-03	4.47E+05	2.35E+01	4.47E+05	7.55E-03	6.02E+05	3.17E+01	6.02E+05

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-dn	1.3	
		Vermiculite	5.0	
		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		
		Plastics -	Polyethylene	1.9
			Polyvinyl Chloride (PVC)	0.5
			Teflon	0.0
	Combustibles (>90% Combustible)	Plexiglass		
		Rubber -	Rubber	
			Surgeons' Glove	
Misc. Combustibles -		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-137T NONMETAL MOLDS AND CRUCIBLES (TRU)

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): 6.36

Gross Mass (kg): 3,610.00

Drum Equivalents: 30.00

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-137T-301

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	30	DRUM	6.36	3,610.00	GRAPHITE CORES
Subtotal	30		6.36	3,610.00	

Total	30	6.36 m3	3,610.00 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		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
3	1,000 <= nCi/g < 2,000	1.20E+02	1.00E+02
4	2,000 <= nCi/g < 3,000	1.10E+02	8.40E+01
5	3,000 <= nCi/g < 4,000	2.30E+02	1.90E+02
7	5,000 <= nCi/g < 6,000	3.50E+02	2.80E+02
8	6,000 <= nCi/g < 7,000	2.30E+02	1.90E+02
9	7,000 <= nCi/g < 8,000	3.40E+02	2.90E+02
10	8,000 <= nCi/g < 9,000	2.50E+02	2.00E+02
11	9,000 <= nCi/g < 10,000	1.10E+02	9.10E+01
12	10,000 <= nCi/g < 20,000	1.30E+03	1.10E+03
13	20,000 <= nCi/g < 30,000	5.60E+02	4.50E+02
Totals		3.60E+03	2.98E+03

Alpha Activity Distribution

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-01	2.22E-07	7.44E+02	1.33E-07	7.44E+02	2.79E-07	9.32E+02	1.67E-07	9.32E+02
PU-52	5.11E+02	1.04E-03	8.26E+04	4.35E+00	8.26E+04	1.28E-03	1.02E+05	5.37E+00	1.02E+05

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
		Ceramic (molds)	
	Misc. Non-Combustible -	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	
		Leadex Rubber	
	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	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-137T NONMETAL MOLDS AND CRUCIBLES (TRU)

C. Code/Name: 312 COARSE GRAPHITE

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

Waste consists of graphite molds, graphite cores, leco crucibles and caps, and graphite electrodes.

Total Volume (m3): 1.91

Gross Mass (kg): 656.00

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:**

There is not information on content code 312. Further information is necessary to better characterize this stream.

ID-EGG-137T-312 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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-137T-312

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	9	DRUM	1.91	656.00	COARSE GRAPHITE
Subtotal	9		1.91	656.00	

Total 9**1.91 m3****656.00 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		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
13	20,000 <= nCi/g < 30,000	7.20E+01	4.90E+01
16	50,000 <= nCi/g < 60,000	7.40E+01	5.10E+01
19	80,000 <= nCi/g < 90,000	1.60E+02	1.20E+02
20	90,000 <= nCi/g < 100,000	8.10E+01	5.80E+01
21	100,000 <= nCi/g < 200,000	1.60E+02	1.10E+02
Totals		5.47E+02	3.88E+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

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	6.50E+01	4.20E+01
Totals		6.50E+01	4.20E+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	6.56E+02	5.25E-03	4.19E+05	2.20E+01	4.19E+05	7.37E-03	5.88E+05	3.09E+01	5.88E+05

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	6.40E-03	9.85E-08	7.85E+00	4.13E-04	7.85E+00	1.51E-07	1.21E+01	6.34E-04	1.21E+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	
		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	
<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.
OTHER (GRAPHITE)			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-137T

NONMETAL MOLDS AND CRUCIBLES (TRU)

C. Code/Name: 814

CONTAMINATED MERCURY OR GRAPHITE CRUCIBLES

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

Waste consists of graphite molds, graphite cores, leco crucibles and caps, and graphite electrodes.

Total Volume (m3): .42

Gross Mass (kg): 120.00

Drum Equivalents: 2.00

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 Mound Laboratory. The records at Mound Laboratory and in the INEL-TCWCIS do not agree on the content. The waste may be either contaminated mercury or graphite crucibles and electrodes.

The waste is WIPP certifiable. Organic content should be less than 14 lb/ft³. Graphite is not included in gas generation determination. The waste is noncombustible, but if pulverized and well mixed it will burn. Fines, should not exceed WIPP-WAC limits. 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, graphite waste is packaged in 1-gallon plastic coated cardboard cartons and/or 1/2-gallon metal cans, contained inside plastic bags. Each metal can may be sealed inside another roll-seam can. The drums are lined with 90 mil drum liners.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-137T-814

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	2	DRUM	0.42	120.00	CONTAMINATED MERCURY OR GRAPHITE CRUCIBLES
Subtotal	2		0.42	120.00	

Total 2**.42 m3****120.00 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		
D009	MERCURY	HIGH MERCURY $\geq$ 260 MG/KG TOTAL MERCURY	7439-97-6		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
19	80,000 <= nCi/g < 90,000	7.20E+01	4.90E+01
23	300,000 <= nCi/g < 400,000	5.00E+01	2.70E+01
Totals		1.22E+02	7.60E+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.

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	1.11E+02	2.06E-03	1.27E+05	1.70E-03	1.27E+05	3.62E-03	2.25E+05	3.00E-03	2.25E+05
PU-240	7.00E+01	1.28E-03	2.90E+05	1.32E-01	2.90E+05	2.24E-03	5.07E+05	2.30E-01	5.07E+05

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.
ABSORBENT (OIL-DRI)			4-1
MERCURY			4-1
ORGANICS	14	LB/FT3	4-1
OTHER (GRAPHITE CRUCIBLES AND ELECTRODES)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-141T PARTICULATE WASTES (TRU)

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): 25.86

Gross Mass (kg): 78,614.01

Drum Equivalents: 122.00

Physical Form: SOLID

Physical Type: ABSORBENT MATERIALS, RUBBER, GLASS, PLASTIC,
OTHERPCBs: ☐

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 form 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 ICP? 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/ft3. 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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-141T-150

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
18	INSERT	3.82	3,630.00	LABORATORY WASTE
104	DRUM	22.05	74,984.00	LABORATORY WASTE
Subtotal	122	25.86	78,614.01	

Total 122**25.86 m3****78,614.01 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	ACID			
D008	LEAD		7439-92-1		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	2.00E+03	1.80E+03
2	500 <= nCi/g < 1,000	5.40E+02	4.90E+02
3	1,000 <= nCi/g < 2,000	1.00E+03	8.60E+02
4	2,000 <= nCi/g < 3,000	1.10E+03	1.00E+03
5	3,000 <= nCi/g < 4,000	7.90E+02	6.80E+02
6	4,000 <= nCi/g < 5,000	2.20E+02	1.60E+02
7	5,000 <= nCi/g < 6,000	6.80E+01	4.50E+01
8	6,000 <= nCi/g < 7,000	1.80E+02	1.10E+02
9	7,000 <= nCi/g < 8,000	6.20E+02	5.30E+02
10	8,000 <= nCi/g < 9,000	3.20E+02	2.80E+02
11	9,000 <= nCi/g < 10,000	2.10E+02	2.10E+02
12	10,000 <= nCi/g < 20,000	1.20E+03	8.10E+02
13	20,000 <= nCi/g < 30,000	3.90E+02	2.80E+02
14	30,000 <= nCi/g < 40,000	4.60E+02	3.50E+02
15	40,000 <= nCi/g < 50,000	2.30E+02	1.40E+02
16	50,000 <= nCi/g < 60,000	3.40E+02	2.50E+02
17	60,000 <= nCi/g < 70,000	4.70E+02	2.70E+02
18	70,000 <= nCi/g < 80,000	5.20E+02	2.90E+02
19	80,000 <= nCi/g < 90,000	2.00E+02	8.50E+01
20	90,000 <= nCi/g < 100,000	6.80E+01	4.50E+01
21	100,000 <= nCi/g < 200,000	5.80E+02	2.90E+02
22	200,000 <= nCi/g < 300,000	3.90E+01	1.60E+01
24	400,000 <= nCi/g < 500,000	1.30E+01	0.00E+00
30	1,000,000 <= nCi/g < 2,500,000	1.60E+01	1.60E+01
31	2,500,000 <= nCi/g < 5,000,000	6.80E-01	0.00E+00
Totals		1.16E+04	9.01E+03

Alpha Activity Distribution

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

TRUMW

ID-EGG-141T-150

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	6.57E+00	7.60E-05	2.54E+05	4.56E-05	2.54E+05	1.37E-04	4.59E+05	8.23E-05	4.59E+05
PU-239	3.73E+03	7.66E-02	4.75E+06	6.35E-02	4.75E+06	3.12E-02	1.94E+06	2.59E-02	1.94E+06
PU-238	1.54E+00	5.91E-06	8.99E+04	4.34E+00	8.99E+04	7.16E-06	1.09E+05	5.26E+00	1.09E+05
PU-242	2.00E-02	2.94E-07	1.16E+00	2.73E-09	1.16E+00	4.41E-07	1.73E+00	4.10E-09	1.73E+00
PU-240	1.06E+02	5.32E-03	1.20E+06	5.48E-01	1.20E+06	5.52E-03	1.25E+06	5.68E-01	1.25E+06
PU-52	2.50E+00	5.51E-05	4.40E+03	2.31E-01	4.40E+03	1.10E-04	8.79E+03	4.62E-01	8.79E+03
U-235	1.86E+04	2.89E-01	0.00E+00	5.56E+02	5.56E+02	6.90E-02	0.00E+00	1.33E+02	1.33E+02
U-238	7.34E+02	8.38E-03	0.00E+00	2.82E+00	2.82E+00	1.25E-02	0.00E+00	4.21E+00	4.21E+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	
<u>Partial Combustible</u> (10%-90% Combustible)	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	2.2
	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benolux/lead	
		Sheetrock	19.8
<u>Combustibles</u> (>90% Combustible)	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

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INEL Waste Profile Sheet

TRUMW

ID-EGG-141T-150

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-141T-372

A. IDENTIFICATION

INEL ID/Name: ID-EGG-141T PARTICULATE WASTES (TRU)

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): 2.97

Gross Mass (kg): 1,800.00

Drum Equivalents: 14.00

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-141T-372

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
14	DRUM	2.97	1,800.00	GRIT
Subtotal	14	2.97	1,800.00	

Total 14**2.97 m3****1,800.00 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)
P015	BERYLLIUM DUST		7440-41-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
3	1,000 <= nCi/g < 2,000	1.90E+02	1.70E+02
12	10,000 <= nCi/g < 20,000	1.10E+02	9.00E+01
13	20,000 <= nCi/g < 30,000	7.20E+01	4.90E+01
18	70,000 <= nCi/g < 80,000	7.70E+01	5.40E+01
19	80,000 <= nCi/g < 90,000	1.10E+02	8.90E+01
20	90,000 <= nCi/g < 100,000	1.00E+02	8.20E+01
21	100,000 <= nCi/g < 200,000	7.20E+02	5.40E+02
Totals		1.38E+03	1.07E+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.

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-52	1.70E+03	5.60E-03	4.47E+05	2.35E+01	4.47E+05	7.42E-03	5.92E+05	3.11E+01	5.92E+05

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 HVPM(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	
		Lead Rubber	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	5.6
		Polyvinyl Chloride (PVC)	1.4
		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.
METAL (GRIT: AL OXIDES & IRON FINES)			4-1
ORGANICS	5	LB/FT3	4-1
OTHER (SPENT SILICA GEL DESICCANT)			4-1

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INEL Waste Profile Sheet

TRUMW

ID-EGG-141T-374

A. IDENTIFICATION

INEL ID/Name: ID-EGG-141T PARTICULATE WASTES (TRU)
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): 53.15

Gross Mass (kg): 29,590.00

Drum Equivalents: 250.72

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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-141T-374

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	161	DRUM	34.13	20,890.00	BLACKTOP, CONCRETE, DIRT AND SAND
	6	BOX	19.02	8,700.00	BLACKTOP, CONCRETE, DIRT AND SAND
Subtotal	167		53.15	29,590.00	

Total 167**53.15 m3****29,590.00 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		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F003	SPENT NON-HALOGENATED SOLVENTS	METHANOL	67-56-1		
F003	SPENT NON-HALOGENATED SOLVENTS	N-BUTYL ALCOHOL	71-36-3		
F003	SPENT NON-HALOGENATED SOLVENTS	XYLENES (TOTAL)	1330-20-7		
F004	SPENT NON-HALOGENATED SOLVENTS	NITROBENZENE	98-95-3		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCivg < 500	5.00E+03	4.40E+03
2	500 <= nCivg < 1,000	1.20E+04	1.00E+04
3	1,000 <= nCivg < 2,000	3.60E+03	2.80E+03
4	2,000 <= nCivg < 3,000	1.40E+03	1.10E+03
5	3,000 <= nCivg < 4,000	2.50E+03	2.00E+03
6	4,000 <= nCivg < 5,000	1.20E+03	9.90E+02
7	5,000 <= nCivg < 6,000	6.80E+02	5.50E+02
8	6,000 <= nCivg < 7,000	1.20E+02	9.70E+01
9	7,000 <= nCivg < 8,000	1.10E+02	9.20E+01
10	8,000 <= nCivg < 9,000	2.40E+02	1.90E+02
11	9,000 <= nCivg < 10,000	6.70E+02	5.50E+02
12	10,000 <= nCivg < 20,000	8.80E+02	7.00E+02
13	20,000 <= nCivg < 30,000	3.30E+02	2.60E+02
14	30,000 <= nCivg < 40,000	7.30E+01	5.00E+01
15	40,000 <= nCivg < 50,000	7.70E+01	5.40E+01
Totals		2.89E+04	2.38E+04

Alpha Activity Distribution

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	1.46E-01	4.74E-07	1.59E+03	2.84E-07	1.59E+03	6.00E-07	2.01E+03	3.60E-07	2.01E+03
PU-52	9.17E+02	2.19E-03	1.75E+05	9.20E+00	1.75E+05	2.94E-03	2.34E+05	1.23E+01	2.34E+05
U-235	1.20E+01	1.20E-04	0.00E+00	2.31E-01	2.31E-01	1.55E-04	0.00E+00	2.98E-01	2.98E-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	
	Misc. Non-Combustible -	Lead (Bulk Pb)	
		Other HVPM (Zn, Cd)	0.0
		Ceramic (molds)	
		Firebrick	
		Concrete	30.0
	Filters/Insulation -	Portland Cement	
		Dirt/Soil	32.5
		Ash	
		Oil-dri	
		Vermiculite	
	Inorganic Sludge -	Salts	
		Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
	Plastics -	Aqueous Solutions	
		Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	32.5
		Benelex/lead	
	Rubber -	Sheetrock	
		Polyethylene	2.4
		Polyvinyl Chloride (PVC)	0.6
<u>Combustibles</u> (>90% Combustible)	Misc. Combustibles -	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-141T PARTICULATE WASTES (TRU)

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): 38.04

Gross Mass (kg): 24,920.00

Drum Equivalents: 179.43

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

TRUMW

ID-EGG-141T-842

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	12	BOX	38.04	24,920.00	CONTAMINATED SOIL
Subtotal	12		38.04	24,920.00	

Total 12

38.04 m3

24,920.00 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			
D003	REACTIVE	OTHER REACTIVES			
D006	CADMIUM	.	7440-43-9		
D007	CHROMIUM	.	7440-47-32		
D008	LEAD	.	7439-92-1		
D009	MERCURY	LOW MERCURY <260 MG/KG TOTAL MERCURY	7439-97-6		
D010	SELENIUM	.	7782-49-2		
D011	SILVER	.	7440-22-4		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
2	500 $\leq$ nCi/g < 1,000	2.80E+04	2.60E+04
3	1,000 $\leq$ nCi/g < 2,000	4.00E+03	3.50E+03
Totals		3.20E+04	2.95E+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.

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	2.00E+01	4.98E-06	3.09E+02	4.12E-06	3.09E+02	5.79E-06	3.59E+02	4.80E-06	3.59E+02
PU-238	1.20E+00	1.01E-07	1.54E+03	7.42E-02	1.54E+03	1.18E-07	1.79E+03	8.65E-02	1.79E+03
PU-83	4.37E-01	4.91E-08	6.24E+02	3.41E-02	6.24E+02	4.91E-08	6.24E+02	3.41E-02	6.24E+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 Stainless Steel Aluminum (AL) Tantalum 10W Miscellaneous Metal Lead (Bulk Pb) Other HVPM (Zn, Cd)	0.3 0.0
	Misc. Non-Combustible	Ceramic (molds) Firebrick Concrete Portland Cement Dirt/Soil Ash Oil-dri Vermiculite Salts	 96.0
	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	
	Plastics	Polyethylene Polyvinyl Chloride (PVC) Teflon Plexiglass	0.8 0.2 0.0
<u>Combustibles</u> (>90% Combustible)	Rubber	Rubber Surgeons' Glove	
	Misc. Combustibles	Graphite (molds) Paper Wood Cardboard Cloth	 2.7

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 AND PEBBLES)			4-1

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-142T-*

A. IDENTIFICATION

INEL ID/Name: ID-EGG-142T TRANSURANIC CONTAMINATED LEAD DEBRIS

C. Code/Name: *

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

This waste is lead contaminated debris from various sources. This debris includes lead pieces, galvanized sheet metal, stainless steel, copper/bronze wire, silicon, impregnated fiberglass, paper, hepa filters, duct, etc.

Total Volume (m3): 5.43

Gross Mass (kg): 1,799.85

Drum Equivalents: 25.61

Physical Form: SOLID

Physical Type: METAL, FILTERS, PAPER

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

TRUMW

ID-EGG-142T-*

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
		5.43	1,799.85	
Subtotal		5.43	1,799.85	

Total**5.43 m3****1,799.85 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		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-142T-*

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****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-144T RADIOACTIVE SOURCES (TRU)

C. Code/Name: 104 ALPHA HOT CELL WASTE

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

Sample fuel Pu & Am sources sources and hot-cell waste.

Total Volume (m3): 58.84

Gross Mass (kg): 14,900.00

Drum Equivalents: 277.55

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 Q-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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-144T-104

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	195	DRUM	41.34	9,300.00	ALPHA HOT CELL WASTE
	5	BIN	17.50	5,600.00	ALPHA HOT CELL WASTE
Subtotal	200		58.84	14,900.00	

Total 200**58.84 m3****14,900.00 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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-144T-104

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		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	6.90E+03	4.30E+03
2	500 <= nCi/g < 1,000	5.30E+03	3.60E+03
3	1,000 <= nCi/g < 2,000	2.30E+03	1.30E+03
4	2,000 <= nCi/g < 3,000	2.70E+02	1.40E+02
5	3,000 <= nCi/g < 4,000	3.60E+02	1.90E+02
7	5,000 <= nCi/g < 6,000	3.50E+02	2.30E+02
8	6,000 <= nCi/g < 7,000	7.30E+01	5.40E+01
9	7,000 <= nCi/g < 8,000	7.00E+01	5.10E+01
10	8,000 <= nCi/g < 9,000	1.40E+02	9.80E+01
12	10,000 <= nCi/g < 20,000	2.00E+02	1.40E+02
Totals		1.60E+04	1.01E+04

Alpha Activity Distribution

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	2.49E+02	7.74E-04	4.80E+04	6.41E-04	4.80E+04	1.13E-03	7.02E+04	9.38E-04	7.02E+04
PU-240	7.53E+00	9.96E-06	2.26E+03	1.03E-03	2.26E+03	1.73E-05	3.91E+03	1.78E-03	3.91E+03
U-235	1.78E+03	1.84E-03	0.00E+00	3.54E+00	3.54E+00	3.02E-03	0.00E+00	5.80E+00	5.80E+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	1.0
	Metals -	Carbon Steel	
		Stainless Steel	40.0
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	1.0
		Other HVPM(Zn,Cd)	
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dn	
		Vermiculite	28.0
		Salts	10.0
	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	
	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	6.4
		Polyvinyl Chloride (PVC)	1.6
		Tellon	0.0
		Plexiglass	
	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-144T RADIOACTIVE SOURCES (TRU)

C. Code/Name: 151 SOLIDIFIED FUEL SLUDGE

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

Sample fuel Pu & Am sources sources and hot-cell waste.

Total Volume (m3): .42

Gross Mass (kg): 320.00

Drum Equivalents: 2.00

Physical Form: SOLID

Physical Type: GLASS, PLASTIC, METAL, ABSORBENT MATERIALS, 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 stream was generated at the Idaho Chemical Processing plant at the INEL, and may include both combustibles and noncombustibles. The waste includes a solidified sludge of acid-dissolved fuel, absorbed into diatomaceous earth. Other materials in the wastes include glass containers, plastics, metal scraps, lead shielding, and lab equipment.

This stream is not presently certifiable (for WIPP) due to insufficient information about the contents. The waste is contained in two 30-gallon drums. At least one of the drums may be lead-lined. The sludge is contained glass bottles and sealed insided metal cans. Other materials may include glass containers, plastics, metal, scraps, lead shielding, and miscellaneous laboratory equipment. The surface dose rate is limited to 30 R/hr. The average nuclide content is around 3 grams per package (about 200,000 nCi/g).

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INEL Waste Profile Sheet

TRUMW

ID-EGG-144T-151

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	2	DRUM	0.42	320.00	SOLIDIFIED FUEL SLUDGE
Subtotal	2		0.42	320.00	

Total 2**.42 m3****320.00 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		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-144T-151

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)
3	1,000 <= nC/g < 2,000	3.20E+02	2.80E+02
Totals		3.20E+02	2.80E+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.

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-52	6.00E+00	1.89E-05	1.51E+03	7.93E-02	1.51E+03	2.15E-05	1.71E+03	9.01E-02	1.71E+03
U-235	4.00E+02	1.26E-03	0.00E+00	2.42E+00	2.42E+00	1.43E-03	0.00E+00	2.75E+00	2.75E+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	10.0	
	Metals -	Carbon Steel		
		Stainless Steel	20.0	
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal		
		Lead (Bulk Pb)	20.0	
	Misc. Non-Combustible -	Other HVPM(Zn,Cd)		
		Ceramic (molds)		
		Firebrick		
		Concrete		
		Portland Cement		
		Dirt/Soil		
		Ash		
		Oil-dri	30.0	
		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	16.0
			Polyvinyl Chloride (PVC)	4.0
			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.
GLASS			4-1
LEAD			4-1
OTHER (EQUIPMENT)			4-1
PAPER			4-1
SLUDGE			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-144T RADIOACTIVE SOURCES (TRU)

C. Code/Name: 153 COMBUSTIBLE LAB WASTE

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

Sample fuel Pu & Am sources and hot-cell waste.

Total Volume (m3): 1.91

Gross Mass (kg): 1,607.00

Drum Equivalents: 9.00

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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-144T-153

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
7	INSERT	1.48	1,500.00	COMBUSTIBLE LAB WASTE
2	DRUM	0.42	107.00	COMBUSTIBLE LAB WASTE
Subtotal 9		1.91	1,607.00	

Total 9

1.91 m3

1,607.00 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. (n.g/kg)	Assumed Max. Conc. (mg/kg)
D008	LEAD	RADIOACTIVE LEAD SOLIDS	64083-05-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	7.20E+02	7.00E+02
2	500 <= nCi/g < 1,000	2.10E+02	2.10E+02
3	1,000 <= nCi/g < 2,000	4.50E+02	4.30E+02
6	4,000 <= nCi/g < 5,000	1.10E+02	8.40E+01
12	10,000 <= nCi/g < 20,000	2.30E+02	1.90E+02
Totals		1.72E+03	1.61E+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.

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	1.30E+01	8.43E-05	5.23E+03	6.99E-05	5.23E+03	1.02E-04	6.34E+03	8.47E-05	6.34E+03
PU-238	2.56E-01	1.05E-06	1.59E+04	7.69E-01	1.59E+04	1.27E-06	1.93E+04	9.30E-01	1.93E+04
PU-241	9.12E-02	1.22E-06	2.12E+03	1.47E+00	2.12E+03	2.58E-06	4.49E+03	3.11E+00	4.49E+03
U-235	1.44E+02	2.23E-04	0.00E+00	4.29E-01	4.29E-01	2.29E-04	0.00E+00	4.41E-01	4.41E-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)	
		Ceramic (molds)	
	Misc. Non-Combustible -	Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	20.0
		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	
	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	16.0
		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.
METAL (METAL PIECES)			4-1, 2
ORGANICS	14	LB/FT3	4-1
OTHER (LEATHER, Q-TIPS, FILTER MEDIA)			4-1, 2
PAPER			4-1, 2
PLASTIC (PVC)			4-1, 2
RUBBER (GASKETS, GLOVES)			4-1, 2
WOOD			4-1, 2

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INEL Waste Profile Sheet

TRUMW

ID-EGG-144T-154

A. IDENTIFICATION

INEL ID/Name: ID-EGG-144T RADIOACTIVE SOURCES (TRU)

C. Code/Name: 154 SAMPLE FUEL

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

Sample fuel Pu & Am sources and hot-cell waste.

Total Volume (m3): 1.91

Gross Mass (kg): 1,890.00

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 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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-144T-154

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	9	DRUM	1.91	1,890.00	SAMPLE FUEL
Subtotal	9		1.91	1,890.00	

Total 9

1.91 m3

1,890.00 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		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 $\leq$ nCi/g $<$ 500	1.30E+03	1.20E+03
12	10,000 $\leq$ nCi/g $<$ 20,000	3.00E+02	2.80E+02
17	60,000 $\leq$ nCi/g $<$ 70,000	2.70E+02	2.30E+02
21	100,000 $\leq$ nCi/g $<$ 200,000	9.00E+01	4.50E+01
Totals		1.96E+03	1.76E+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.

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	4.76E+02	3.37E-03	2.09E+05	2.80E-03	2.09E+05	6.05E-03	3.75E+05	5.02E-03	3.75E+05
PU-240	2.70E+01	1.19E-04	2.70E+04	1.23E-02	2.70E+04	1.32E-04	3.00E+04	1.36E-02	3.00E+04
U-235	3.70E+02	4.96E-03	0.00E+00	9.54E+00	9.54E+00	9.88E-03	0.00E+00	1.90E+01	1.90E+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.
ORGANICS	14	LB/FT3	4-1
OTHER (ACTINIDE NEUTRON SOURCES, RADIUM NEEDLE)			4-1, 2
OTHER (FUEL)			4-1, 2

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-145T-430

A. IDENTIFICATION

INEL ID/Name: ID-EGG-145T RESINS (TRU)

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): 4.24

Gross Mass (kg): 3,590.00

Drum Equivalents: 20.00

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

TRUMW

ID-EGG-145T-430

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	20	DRUM	4.24	3,590.00	UNLEACHED ION COLUMN RESIN
Subtotal	20		4.24	3,590.00	

Total 20**4.24 m3****3,590.00 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			

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
12	10,000 <= nCv/g < 20,000	2.60E+02	2.20E+02
14	30,000 <= nCv/g < 40,000	4.80E+02	3.90E+02
15	40,000 <= nCv/g < 50,000	3.70E+02	2.80E+02
16	50,000 <= nCv/g < 60,000	5.00E+02	4.10E+02
17	60,000 <= nCv/g < 70,000	6.90E+02	5.60E+02
18	70,000 <= nCv/g < 80,000	6.00E+02	4.60E+02
19	80,000 <= nCv/g < 90,000	7.70E+02	5.80E+02
Totals		3.67E+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.

Alpha Activity Distribution

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-145T-430

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	2.72E+03	4.64E-03	3.70E+05	1.95E+01	3.70E+05	5.92E-03	4.72E+05	2.48E+01	4.72E+05

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 Benelex/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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-145T-431

A. IDENTIFICATION

INEL ID/Name: ID-EGG-145T RESINS (TRU)

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): .85

Gross Mass (kg): 733.00

Drum Equivalents: 4.00

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-145T-431

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	4	DRUM	0.85	733.00	LEACHED RESIN
Subtotal	4		0.85	733.00	

Total 4**.85 m3****733.00 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			

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
13	20,000 <= nCvg < 30,000	5.70E+02	4.60E+02
14	30,000 <= nCvg < 40,000	1.60E+02	1.20E+02
Totals		7.30E+02	5.80E+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.

Alpha Activity Distribution

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-145T-431

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	2.63E+02	7.47E-04	5.96E+04	3.13E+00	5.96E+04	9.88E-04	7.88E+04	4.15E+00	7.88E+04

F. Design Basis Bulk Waste Materials

WASTE MATRIX CONSTITUENTSPHYSICAL/CHEMICAL COMPOSITION

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	

Component	Conc.	Units of Conc.	Ref.
OTHER (LEACHED ANIONIC AND CATIONIC EXCHANGE RESIN)			4-1

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-145T-432

A. IDENTIFICATION

INEL ID/Name: ID-EGG-145T RESINS (TRU)

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): 51.52

Gross Mass (kg): 30,300.00

Drum Equivalents: 243.00

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-145T-432

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	243	DRUM	51.52	30,300.00	LEACHED AND CEMENTED RESIN
Subtotal	243		51.52	30,300.00	

Total 243

51.52 m3

30,300.00 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		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
2	500 <= nC/g < 1,000	7.70E+02	6.40E+02
3	1,000 <= nC/g < 2,000	6.30E+02	5.20E+02
4	2,000 <= nC/g < 3,000	1.40E+03	1.20E+03
5	3,000 <= nC/g < 4,000	6.70E+02	5.70E+02
6	4,000 <= nC/g < 5,000	7.90E+02	6.50E+02
7	5,000 <= nC/g < 6,000	7.50E+02	6.20E+02
8	6,000 <= nC/g < 7,000	7.40E+02	5.90E+02
9	7,000 <= nC/g < 8,000	7.40E+02	6.30E+02
10	8,000 <= nC/g < 9,000	1.80E+03	1.50E+03
11	9,000 <= nC/g < 10,000	8.50E+02	6.60E+02
12	10,000 <= nC/g < 20,000	7.20E+03	5.90E+03
13	20,000 <= nC/g < 30,000	4.00E+03	3.20E+03
14	30,000 <= nC/g < 40,000	3.00E+03	2.40E+03
15	40,000 <= nC/g < 50,000	1.30E+03	1.10E+03
16	50,000 <= nC/g < 60,000	1.40E+03	1.10E+03
17	60,000 <= nC/g < 70,000	1.20E+03	9.60E+02
18	70,000 <= nC/g < 80,000	3.90E+02	3.00E+02
19	80,000 <= nC/g < 90,000	5.20E+02	4.00E+02
20	90,000 <= nC/g < 100,000	1.40E+02	1.10E+02
21	100,000 <= nC/g < 200,000	1.50E+03	1.10E+03
Totals		2.98E+04	2.42E+04

Alpha Activity Distribution

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	4.06E+01	4.15E-05	1.39E+05	2.49E-05	1.39E+05	5.71E-05	1.91E+05	3.43E-05	1.91E+05
PU-52	9.11E+03	7.22E-03	5.76E+05	3.03E+01	5.76E+05	9.11E-03	7.27E+05	3.82E+01	7.27E+05

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-dn	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	
		Cemented Resin	82.1
		Asphalt	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	9.5
		Polyvinyl Chloride (PVC)	2.4
		Tellon	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 (LEACHED & CEMENTED ANION,CATION EXCHG RESIN			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-146T SALTS (TRU)

C. Code/Name: 5 EVAPORATOR SALTS

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

Evaporator salts and pyrochemical salts

Total Volume (m3): .64

Gross Mass (kg): 550.00

Drum Equivalents: 3.00

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-146T-5

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
3	DRUM	0.64	550.00	EVAPORATOR SALTS
Subtotal	3	0.64	550.00	

Total 3**.64 m3****550.00 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			

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
14	30,000 <= nCi/g < 40,000	6.60E+02	6.00E+02
Totals		6.60E+02	6.00E+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.

Alpha Activity Distribution

14
Interval Number

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	7.20E+00	1.09E-05	3.63E+04	6.51E-06	3.63E+04	1.21E-05	4.05E+04	7.26E-06	4.05E+04
PU-52	5.40E+00	8.14E-06	6.50E+02	3.42E-02	6.50E+02	9.07E-06	7.24E+02	3.81E-02	7.24E+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	
		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	
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	4.0
		Polyvinyl Chloride (PVC)	1.0
		Teflon	0.0
<u>Combustibles</u> (>90% Combustible)		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-146T SALTS (TRU)

C. Code/Name: 124 CERTIFIED TRU PYROCHEMICAL SALT WASTE

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

Evaporator salts and pyrochemical salts

Total Volume (m3): 3.18

Gross Mass (kg): 1,100.00

Drum Equivalents: 15.00

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) pyrochemical salt consists of used chloride salts from pyrochemical processes such as electrorefining, molten salt extraction or direct oxide reduction. Very little additional information is available about this content code. The waste has been certified to be shipped to WIPP.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-146T-124

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	15	DRUM	3.18	1,100.00	CERTIFIED TRU PYROCHEMICAL SALT WASTE
Subtotal	15		3.18	1,100.00	

Total 15

3.18 m3

1,100.00 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)
D003	REACTIVE	WATER REACTIVE			

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
15	40,000 <= nCvg < 50,000	7.70E+01	4.70E+01
20	90,000 <= nCvg < 100,000	1.60E+02	1.30E+02
21	100,000 <= nCvg < 200,000	3.90E+02	2.40E+02
22	200,000 <= nCvg < 300,000	3.90E+02	1.80E+02
23	300,000 <= nCvg < 400,000	1.00E+02	3.90E+01
Totals		1.12E+03	6.36E+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

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INEL Waste Profile Sheet

TRUMW

ID-EGG-146T-124

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	2.66E+03	1.09E-02	8.69E+05	4.57E+01	8.70E+05	2.29E-02	1.82E+06	9.59E+01	1.82E+06

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)	29.8
	Misc. Non-Combustible -	Ceramic (molds) Firebrick Concrete Portland Cement Dirt/Soil Ash Oil-dn Vermiculite Salts	25.5 36.2
	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	6.8 1.7 0.0
	Rubber -	Rubber Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds) Paper Wood Cardboard Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
OTHER (PYROCHEMICAL SALTS)			4-1

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-146T-409

A. IDENTIFICATION

INEL ID/Name: ID-EGG-146T SALTS (TRU)

C. Code/Name: 409 MOLTEN SALTS - 30% UNPULVERIZED

B. DESCRIPTION

INEL ID (WMIS) Description:
Evaporator salts and pyrochemical salts.

Total Volume (m3): 6.57

Gross Mass (kg): 3,200.00

Drum Equivalents: 31.00

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 was generated at the Rocky Flats Plant. Very little information is available about this content code. The composition of the salt itself is not specified.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-146T-409

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	31	DRUM	6.57	3,200.00	MOLTEN SALTS - 30% UNPULVERIZED
Subtotal	31		6.57	3,200.00	

Total 31**6.57 m3****3,200.00 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)
D028	1,2-DICHLOROETHANE		107-06-2		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
14	30,000 <= nCvg < 40,000	1.30E+02	1.00E+02
15	40,000 <= nCvg < 50,000	1.30E+02	1.00E+02
20	90,000 <= nCvg < 100,000	1.20E+02	9.70E+01
21	100,000 <= nCvg < 200,000	5.00E+02	3.70E+02
22	200,000 <= nCvg < 300,000	8.30E+02	6.20E+02
23	300,000 <= nCvg < 400,000	3.70E+02	2.70E+02
24	400,000 <= nCvg < 500,000	6.60E+02	5.20E+02
25	500,000 <= nCvg < 600,000	3.30E+02	2.60E+02
30	1,000,000 <= nCvg < 2,500,000	1.20E+02	9.70E+01
Totals		3.19E+03	2.43E+03

Alpha Activity Distribution

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	2.17E+02	7.37E-04	2.47E+06	4.42E-04	2.47E+06	9.26E-04	3.10E+06	5.56E-04	3.10E+06
PU-52	4.08E+03	9.05E-03	7.22E+05	3.79E+01	7.22E+05	1.18E-02	9.40E+05	4.94E+01	9.40E+05

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	29.8
		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	25.5
		Salts	36.2
	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	
	Plastics -	Polyethylene	6.8
		Polyvinyl Chloride (PVC)	1.7
		Teflon	0.0
<u>Combustibles</u> (>90% Combustible)		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
SALT			4-1, 2

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-146T-414

A. IDENTIFICATION

INEL ID/Name: ID-EGG-146T

SALTS (TRU)

C. Code/Name: 414

DIRECT OXIDE REDUCTION SALT

B. DESCRIPTION

INEL ID (WMIS) Description:

Evaporator salts and pyrochemical salts.

Total Volume (m3): 1.06

Gross Mass (kg): 430.00

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:**

This waste, generated at the Rocky Flats Plant, consists of chunks of salt and ceramic. No other information is available. The waste is certifiable for shipment to WIPP.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-146T-414

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
5	DRUM	1.06	430.00	DIRECT OXIDE REDUCTION SALT
Subtotal	5	1.06	430.00	

Total 5**1.06 m3****430.00 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		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
15	40,000 <= nCi/g < 50,000	5.30E+01	3.00E+01
21	100,000 <= nCi/g < 200,000	3.20E+02	2.50E+02
22	200,000 <= nCi/g < 300,000	6.40E+01	4.10E+01
Totals		4.37E+02	3.21E+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	2.60E-02	1.73E-07	5.80E+02	1.04E-07	5.80E+02	2.04E-07	6.83E+02	1.23E-07	6.83E+02
PU-52	7.66E+02	5.08E-03	4.05E+05	2.13E+01	4.05E+05	7.48E-03	5.97E+05	3.14E+01	5.97E+05

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	9.7
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
	<u>Misc. Non-Combustible</u> -	Other HVPM(Zn,Cd)	
		Ceramic (molds)	18.7
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	
		Vermiculite	5.7
		Salts	50.6
	<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	
		Lead 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	12.2
		Polyvinyl Chloride (PVC)	3.0
		Teflon	0.0
		Plexiglass	
	<u>Rubber</u> -	Rubber	
		Surgeons' Glove	
	<u>Misc. Combustibles</u> -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
CERAMIC			4-1
OTHER (SALT CHUNKS)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-158T UNCEMENTED ORGANIC SLUDGE (TRU)

C. Code/Name: 3 ORGANIC SETIPS, OIL SOLIDS

B. DESCRIPTION

INEL ID (WMIS) Description:

Miscellaneous organic setups

Total Volume (m3): 569.37

Gross Mass (kg): 631,400.04

Drum Equivalents: 2,685.72

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/ti3. 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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-158T-3

C. STORAGE

waste from the calcium silicate, and damage to the inner plastic bag. In addition, bottles of organic wastes may be included periodically.

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
2596	DRUM	550.35	623,300.04	ORGANIC SETIPS, OIL SOLIDS
6	BOX	19.02	8,100.00	ORGANIC SETIPS, OIL SOLIDS
Subtotal	2602	569.37	631,400.04	

Total 2,602**569.37 m3****631,400.04 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		
D011	SILVER		7440-22-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,1-TRICHLOROETHANE	71-55-6		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	CARBON TETRACHLORIDE	56-23-5		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TETRACHLOROETHYLENE	127-18-4		
F001	SPENT HALOGENATED SOLVENTS USED IN DEGREASING	TRICHLOROETHYLENE	79-01-6		
F002	SPENT HALOGENATED SOLVENTS	METHYLENE CHLORIDE	75-9-2		
F004	SPENT NON-HALOGENATED SOLVENTS	NITROBENZENE	98-95-3		
P015	BERYLLIUM DUST		7440-41-7		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nC/g < 500	4.20E+05	3.80E+05
2	500 <= nC/g < 1,000	8.10E+04	7.20E+04
3	1,000 <= nC/g < 2,000	3.90E+04	3.40E+04
4	2,000 <= nC/g < 3,000	2.50E+04	2.20E+04
5	3,000 <= nC/g < 4,000	6.20E+03	5.50E+03
6	4,000 <= nC/g < 5,000	1.20E+03	1.00E+03
7	5,000 <= nC/g < 6,000	4.20E+02	3.70E+02
8	6,000 <= nC/g < 7,000	3.80E+02	3.30E+02
12	10,000 <= nC/g < 20,000	1.20E+03	1.10E+03
13	20,000 <= nC/g < 30,000	2.00E+02	1.80E+02
14	30,000 <= nC/g < 40,000	1.90E+02	1.70E+02
Totals		5.75E+05	5.17E+05

Alpha Activity Distribution

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 mass + waste mass. Waste Mass = Mass of Waste only.

AIM

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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)
AM-241	7.89E+00	1.82E-05	6.08E+04	1.09E-05	6.08E+04	2.05E-05	6.85E+04	1.23E-05	6.85E+04
PU-52	3.73E+03	3.31E-04	2.64E+04	1.39E+00	2.64E+04	3.76E-04	3.00E+04	1.58E+00	3.00E+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	
		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	1.0
		Vermiculite	0.3
		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	
		Partially Combustible -	
<u>Partial Combustible</u> (10%-90% Combustible)		Leaded Rubber	
		Organic Sludge	97.6
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
		Plastics -	
<u>Combustibles</u> (>90% Combustible)		Polyethylene	0.9
		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.
1,1,1-TRICHLOROETHANE (TCA)	10	% VOL	4-1, 2
ABSORBENT (OIL-DRI)			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. IDENTIFICATION

INEL ID/Name: ID-EGG-287T UNCATEGORIZED (TRU)

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): 4,139.66

Gross Mass (kg): 1,803,970.12

Drum Equivalents: 19,526.68

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-287T-0

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
18338	DRUM	3,887.66	1,736,370.11	NOT RECORDED - UNKNOWN
72	BIN	252.00	67,600.00	NOT RECORDED - UNKNOWN
Subtotal	18410	4,139.66	1,803,970.12	

Total 18,410**4,139.66 m3****1,803,970.12 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 constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	9.30E+05	8.00E+05
2	500 <= nCi/g < 1,000	4.60E+05	3.30E+05
3	1,000 <= nCi/g < 2,000	4.30E+05	2.20E+05
4	2,000 <= nCi/g < 3,000	1.10E+04	5.90E+03
5	3,000 <= nCi/g < 4,000	3.90E+03	2.90E+03
6	4,000 <= nCi/g < 5,000	6.10E+03	5.10E+03
7	5,000 <= nCi/g < 6,000	2.60E+03	2.20E+03
8	6,000 <= nCi/g < 7,000	2.90E+03	2.40E+03
9	7,000 <= nCi/g < 8,000	2.40E+03	2.10E+03
10	8,000 <= nCi/g < 9,000	1.70E+03	1.40E+03
11	9,000 <= nCi/g < 10,000	1.90E+03	1.50E+03
12	10,000 <= nCi/g < 20,000	7.00E+03	5.90E+03
13	20,000 <= nCi/g < 30,000	1.10E+03	8.20E+02
14	30,000 <= nCi/g < 40,000	1.20E+03	9.20E+02
15	40,000 <= nCi/g < 50,000	1.30E+03	1.10E+03
16	50,000 <= nCi/g < 60,000	2.00E+02	1.50E+02
17	60,000 <= nCi/g < 70,000	2.70E+02	1.50E+02
18	70,000 <= nCi/g < 80,000	8.00E+01	5.80E+01
19	80,000 <= nCi/g < 90,000	8.40E+01	3.80E+01
21	100,000 <= nCi/g < 200,000	4.00E+03	3.40E+03
22	200,000 <= nCi/g < 300,000	7.10E+02	4.60E+02
23	300,000 <= nCi/g < 400,000	1.20E+03	9.30E+02
24	400,000 <= nCi/g < 500,000	1.80E+03	1.30E+03
25	500,000 <= nCi/g < 600,000	6.70E+02	4.20E+02
26	600,000 <= nCi/g < 700,000	1.20E+03	7.90E+02
27	700,000 <= nCi/g < 800,000	4.10E+02	2.10E+02
28	800,000 <= nCi/g < 900,000	4.10E+01	1.80E+01
29	900,000 <= nCi/g < 1,000,000	7.30E+01	2.70E+01
30	1,000,000 <= nCi/g < 2,500,000	2.40E+02	1.70E+02
34	10,000,000 <= nCi/g	5.90E+02	0.00E+00
Totals		1.87E+06	1.39E+06

Alpha Activity Distribution

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	1.08E+03	1.74E-03	5.83E+06	1.05E-03	5.83E+06	3.11E-03	1.04E+07	1.87E-03	1.04E+07
PU-239	2.31E+04	7.09E-03	4.40E+05	5.88E-03	4.40E+05	9.25E-03	5.74E+05	7.67E-03	5.74E+05
PU-238	1.20E+01	7.78E-05	1.18E+06	5.71E+01	1.18E+06	1.69E-04	2.56E+06	1.24E+02	2.56E+06
PU-52	2.77E+03	4.21E-03	3.36E+05	1.77E+01	3.36E+05	2.35E-02	1.87E+06	9.85E+01	1.87E+06

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-287T-0

23-Mar-94

INEL Waste Profile Sheet

TRUMW ID-EGG-287T-9999

A. IDENTIFICATION

INEL ID/Name: ID-EGG-287T UNCATEGORIZED (TRU)

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): 4,511.78

Gross Mass (kg): 2,207,022.15

Drum Equivalents: 21,282.00

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

23-Mar-94

INEL Waste Profile Sheet

TRUMW ID-EGG-287T-9999

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	21282	DRUM	4,511.78	2,207,022.15	PRE 73 DRUMS
Subtotal	21282		4,511.78	2,207,022.15	

Total	21,282	4,511.78 m3	2,207,022.15 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 constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-102

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288T UNKNOWN (TRU)

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 TRU trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 54.30

Gross Mass (kg): 21,570.00

Drum Equivalents: 256.11

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-102

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
12	BIN	42.00	15,000.00	ABSORBED LIQUIDS
58	DRUM	12.30	6,570.00	ABSORBED LIQUIDS
Subtotal	70	54.30	21,570.00	

Total 70**54.30 m3****21,570.00 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 constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	7.60E+03	5.70E+03
2	500 <= nCi/g < 1,000	3.80E+03	2.80E+03
4	2,000 <= nCi/g < 3,000	5.20E+03	4.00E+03
5	3,000 <= nCi/g < 4,000	1.20E+03	9.70E+02
7	5,000 <= nCi/g < 6,000	9.80E+02	7.90E+02
8	6,000 <= nCi/g < 7,000	5.80E+02	4.70E+02
10	8,000 <= nCi/g < 9,000	1.40E+02	1.20E+02
11	9,000 <= nCi/g < 10,000	5.70E+02	4.60E+02
12	10,000 <= nCi/g < 20,000	7.00E+02	5.50E+02
13	20,000 <= nCi/g < 30,000	8.20E+02	6.60E+02
15	40,000 <= nCi/g < 50,000	4.10E+02	3.20E+02
16	50,000 <= nCi/g < 60,000	2.60E+02	1.90E+02
18	70,000 <= nCi/g < 80,000	9.40E+02	7.60E+02
19	80,000 <= nCi/g < 90,000	3.00E+02	2.40E+02
21	100,000 <= nCi/g < 200,000	4.80E+01	2.50E+01
Totals		2.35E+04	1.81E+04

Alpha Activity Distribution

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	6.03E-01	1.04E-06	3.48E+03	6.23E-07	3.48E+03	1.31E-06	4.40E+03	7.88E-07	4.40E+03
PU-239	1.14E+03	2.22E-03	1.38E+05	1.84E-03	1.38E+05	3.20E-03	1.99E+05	2.65E-03	1.99E+05
PU-240	5.71E+02	1.66E-03	3.76E+05	1.71E-01	3.76E+05	2.50E-03	5.68E+05	2.58E-01	5.68E+05
TH-232	9.80E+01	7.45E-05	0.00E+00	2.07E-02	2.07E-02	9.72E-05	0.00E+00	2.70E-02	2.70E-02
U-235	1.60E+01	6.66E-06	0.00E+00	1.28E-02	1.28E-02	8.94E-06	0.00E+00	1.72E-02	1.72E-02
U-238	1.09E+03	5.95E-04	0.00E+00	2.00E-01	2.00E-01	7.64E-04	0.00E+00	2.57E-01	2.57E-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	
		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	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	59.0
	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
	Combustibles (>90% Combustible)	Sheetrock	
		Plastics - Polyethylene	4.8
		Polyvinyl Chloride (PVC)	1.2
		Teflon	0.0
	Rubber -	Plexiglass	
		Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	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-288T UNKNOWN (TRU)

C. Code/Name: 105 EMPTY BOTTLES

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 TRU trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 1.48

Gross Mass (kg): 320.00

Drum Equivalents: 7.00

Physical Form: SOLID

Physical Type: GLASS, 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 Argonne National Laboratory-East, consists of PE and glass bottles used to transport liquid wastes.

The waste is WIPP certifiable. Gas generation potential should be acceptable, since the organic content is around 5 lb/ft³. The levels of dispersible fines should be within WIPP-WAC limits. No sludges or free liquids should be present, except for small quantities of wet vermiculite. No explosive or pyrophoric materials should be in the waste.

The bottles have the tops removed, and are filled with vermiculite. The bottles are placed with more vermiculite in 55-gallon drums fitted with 90 mil liners. The drums are shipped in M-III bins. After receipt of the bins at INEL-RWMC, the drums are removed from the bins for storage. The bins may be reused.

ID-EGG-288T-105 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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-105

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	7	DRUM	1.48	320.00	EMPTY BOTTLES
Subtotal	7		1.48	320.00	

Total 7**1.48 m3****320.00 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 constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 $\leq$ nCi/g $<$ 500	3.80E+01	1.50E+01
12	10,000 $\leq$ nCi/g $<$ 20,000	4.10E+01	1.80E+01
15	40,000 $\leq$ nCi/g $<$ 50,000	1.20E+02	4.70E+01
16	50,000 $\leq$ nCi/g $<$ 60,000	5.30E+01	3.00E+01
Totals		2.52E+02	1.10E+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 CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g $<$ 100	7.50E+01	3.00E+01
Totals		7.50E+01	3.00E+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.

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	3.27E+01	4.97E-04	3.08E+04	4.12E-04	3.08E+04	1.07E-03	6.63E+04	8.85E-04	6.63E+04
PU-240	3.07E+01	3.78E-04	8.58E+04	3.90E-02	8.58E+04	7.92E-04	1.79E+05	8.15E-02	1.79E+05

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	7.60E-02	1.01E-06	6.28E+01	8.40E-07	6.28E+01	2.56E-06	1.59E+02	2.13E-06	1.59E+02
PU-240	1.04E-02	1.39E-07	3.14E+01	1.43E-05	3.14E+01	3.51E-07	7.95E+01	3.61E-05	7.95E+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		
		Other Glass	8.0	
	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		
		Vermiculite	72.0	
		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		
		Leaded Rubber		
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelex/lead		
		Sheetrock		
		Plastics -	Polyethylene	16.0
			Polyvinyl Chloride (PVC)	4.0
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 (VERMICULITE)			4-1, 2
GLASS (BOTTLES)			4-1, 2
ORGANICS	5	LB/FT3	4-1
PLASTIC (POLYETHYLENE BOTTLES)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288T UNKNOWN (TRU)

C. Code/Name: 106 SPECIAL SOURCE MATERIAL

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 TRU trash and solidified liquids. Characterization activities are in progress.

Content Code Description:

There is not content information on this code, which was generated at ANL-East.

Total Volume (m3): .21

Gross Mass (kg): 75.00

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

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INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-106

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	1	DRUM	0.21	75.00	SPECIAL SOURCE MATERIAL
Subtotal	1		0.21	75.00	

Total 1**.21 m3****75.00 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 constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
26	600,000 <= nCi/g < 700,000	7.50E+01	5.20E+01
Totals		7.50E+01	5.20E+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.

Alpha Activity Distribution

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INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-106

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	1.96E+02	2.61E-03	1.62E+05	2.17E-03	1.62E+05	3.75E-03	2.32E+05	3.11E-03	2.32E+05
PU-240	1.64E+02	2.19E-03	4.96E+05	2.25E-01	4.96E+05	3.14E-03	7.10E+05	3.23E-01	7.10E+05

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-288T UNKNOWN (TRU)

C. Code/Name: 107

UNCERTIFIED TRU - RH WASTE

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 TRU trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 6.36

Gross Mass (kg): 1,600.00

Drum Equivalents: 30.00

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 code, which was generated at ANL-East.

ID-EGG-288T-107 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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-107

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	30	DRUM	6.36	1,600.00	UNCERTIFIED TRU - RH WASTE
Subtotal	30		6.36	1,600.00	

Total 30**6.36 m3****1,600.00 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)

UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	2.30E+03	1.40E+03
2	500 <= nCi/g < 1,000	2.80E+03	1.80E+03
3	1,000 <= nCi/g < 2,000	4.20E+02	2.10E+02
4	2,000 <= nCi/g < 3,000	5.20E+01	3.30E+01
5	3,000 <= nCi/g < 4,000	4.40E+01	2.50E+01

Totals

5.62E+03 3.47E+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.

Alpha Activity Distribution

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	9.10E+02

Totals

1.40E+03 9.10E+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	3.38E+01	9.05E-05	5.61E+03	7.50E-05	5.61E+03	1.55E-04	9.61E+03	1.28E-04	9.61E+03
PU-240	5.93E+00	1.14E-05	2.58E+03	1.17E-03	2.58E+03	1.96E-05	4.44E+03	2.02E-03	4.44E+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	5.80E-01	4.24E-07	2.63E+01	3.52E-07	2.63E+01	6.38E-07	3.96E+01	5.29E-07	3.96E+01
PU-240	6.44E-02	4.71E-08	1.07E+01	4.86E-06	1.07E+01	7.09E-08	1.61E+01	7.30E-06	1.61E+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.
GLASS			4-2
METAL			4-2
PAPER			4-2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288T UNKNOWN (TRU)

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 TRU trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 14.59

Gross Mass (kg): 6,240.00

Drum Equivalents: 68.81

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 or 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 fiberglass-reinforced polyester fiberglass-reinforced polyester (FRP) coated.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-155

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	9	DRUM	1.91	1,140.00	TRU SCRAP
	4	BOX	12.68	5,100.00	TRU SCRAP
Subtotal	13		14.59	6,240.00	

Total 13**14.59 m3****6,240.00 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)

UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
3	1,000 <= nCi/g < 2,000	5.10E+02	4.20E+02
7	5,000 <= nCi/g < 6,000	3.90E+02	3.60E+02
12	10,000 <= nCi/g < 20,000	4.40E+03	4.30E+03
13	20,000 <= nCi/g < 30,000	1.00E+03	1.00E+03
17	60,000 <= nCi/g < 70,000	6.80E+01	4.50E+01
18	70,000 <= nCi/g < 80,000	9.00E+01	6.70E+01
19	80,000 <= nCi/g < 90,000	8.90E+01	6.60E+01
22	200,000 <= nCi/g < 300,000	5.70E+01	3.40E+01
23	300,000 <= nCi/g < 400,000	6.80E+01	2.30E+01
Totals		6.67E+03	6.32E+03

Alpha Activity Distribution

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	2.68E+01	1.30E-05	4.34E+04	7.77E-06	4.34E+04	1.31E-05	4.40E+04	7.88E-06	4.40E+04
PU-239	3.36E+02	4.11E-03	2.55E+05	3.40E-03	2.55E+05	6.63E-03	4.11E+05	5.49E-03	4.11E+05
PU-238	1.50E+00	2.21E-05	3.35E+05	1.62E+01	3.35E+05	6.61E-05	1.01E+06	4.85E+01	1.01E+06
PU-240	5.84E+01	1.00E-03	2.27E+05	1.03E-01	2.27E+05	1.65E-03	3.74E+05	1.70E-01	3.74E+05
TH-232	5.50E+03	1.43E-02	0.00E+00	3.96E+00	3.96E+00	1.52E-02	0.00E+00	4.21E+00	4.21E+00
U-235	1.28E+02	1.88E-03	0.00E+00	3.62E+00	3.62E+00	2.82E-03	0.00E+00	5.43E+00	5.43E+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	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	
		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	40.0
		Polyvinyl Chloride (PVC)	10.0
		Tellon	0.1
		Plexiglass	
	Rubber -	Rubber	1.0
	Misc. Combustibles -	Surgeons' Glove	
		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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-157

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288T UNKNOWN (TRU)

C. Code/Name: 157 MISCELLANEOUS SOURCES

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 TRU trash and solidified liquids. Characterization activities are in progress.

Content Code Description:

This waste stream was generated at the INEL. Additional information is not available at this time.

Total Volume (m3): .42

Gross Mass (kg): 150.00

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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-157

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	2	DRUM	0.42	150.00	MISCELLANEOUS SOURCES
Subtotal	2		0.42	150.00	

Total 2**.42 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.

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 constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
8	6,000 <= nC/g < 7,000	9.10E+01	6.80E+01
12	10,000 <= nC/g < 20,000	1.90E+02	1.60E+02
18	70,000 <= nC/g < 80,000	5.40E+01	3.10E+01
Totals		3.35E+02	2.59E+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

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INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-157

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	2.09E+00	2.78E-05	9.31E+04	1.67E-05	9.31E+04	4.52E-05	1.51E+05	2.71E-05	1.51E+05
CF-252	1.00E-04	1.85E-09	6.84E-03	1.90E+01	1.90E+01	3.19E-09	1.18E-02	3.28E+01	3.28E+01
PU-239	1.00E+00	1.10E-05	6.81E+02	9.11E-06	6.81E+02	1.46E-05	9.08E+02	1.21E-05	9.08E+02

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-288T UNKNOWN (TRU)

C. Code/Name: 160

ANL-W HFEF ANALYTICAL CHEMISTRY AND
METALLOGRAPHIC COMBUSTIBLES**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 TRU trash and solidified liquids. Characterization activities are in progress.

Content Code Description:

There is no content information for this code, which includes waste from INEL.

Total Volume (m3): .21

Gross Mass (kg): 230.00

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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-160

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	INSERT	0.21	230.00	ANL-W HFEF ANALYTICAL CHEMISTRY AND METALLOGRAPHIC
Subtotal	1	0.21	230.00	

Total 1**.21 m3****230.00 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 constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
10	8,000 <= nCi/g < 9,000	2.30E+02	2.30E+02
Totals		2.30E+02	2.30E+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.

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	3.21E+01	1.40E-04	8.65E+03	1.16E-04	8.65E+03	1.40E-04	8.65E+03	1.16E-04	8.65E+03
U-235	1.30E+02	5.65E-04	0.00E+00	1.09E+00	1.09E+00	5.65E-04	0.00E+00	1.09E+00	1.09E+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-288T

UNKNOWN (TRU)

C. Code/Name: 162

ANL-W FMF EFL ZR-U FUEL CASTING ALLOYS RESIDUES

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 TRU trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 8.69

Gross Mass (kg): 2,200.00

Drum Equivalents: 41.00

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:**

There is no content information for this code, which includes waste from Idaho National Engineering Laboratory.

ID-EGG-288T-162 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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-162

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	41	DRUM	8.69	2,200.00	ANL-W FMF EFL ZR-U FUEL CASTING ALLOYS RESIDUES
Subtotal	41		8.69	2,200.00	

Total 41**8.69 m3****2,200.00 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)

UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	7.50E+02	4.90E+02
2	500 <= nCi/g < 1,000	6.80E+01	4.50E+01
4	2,000 <= nCi/g < 3,000	8.40E+01	6.10E+01
5	3,000 <= nCi/g < 4,000	1.60E+02	1.20E+02
6	4,000 <= nCi/g < 5,000	7.70E+01	5.40E+01
9	7,000 <= nCi/g < 8,000	8.20E+01	5.90E+01
11	9,000 <= nCi/g < 10,000	7.30E+01	5.00E+01
12	10,000 <= nCi/g < 20,000	1.60E+02	1.10E+02
14	30,000 <= nCi/g < 40,000	1.30E+02	7.20E+01
17	60,000 <= nCi/g < 70,000	7.80E+01	3.30E+01
18	70,000 <= nCi/g < 80,000	8.00E+01	3.50E+01
19	80,000 <= nCi/g < 90,000	4.10E+01	1.10E+01
20	90,000 <= nCi/g < 100,000	5.80E+02	2.30E+02
21	100,000 <= nCi/g < 200,000	3.10E+02	1.30E+02
Totals		2.67E+03	1.50E+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.

Alpha Activity Distribution

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
0	nCi/g < 100	7.00E+01	4.70E+01
Totals		7.00E+01	4.70E+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-239	1.90E+03	8.31E-03	5.15E+05	6.89E-03	5.15E+05	2.12E-02	1.31E+06	1.76E-02	1.31E+06
PU-240	2.11E+00	2.57E-05	5.83E+03	2.65E-03	5.83E+03	3.56E-05	8.06E+03	3.66E-03	8.06E+03
U-235	4.10E+03	2.08E-02	0.00E+00	4.00E+01	4.00E+01	5.23E-02	0.00E+00	1.01E+02	1.01E+02

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-02	5.71E-07	3.54E+01	4.74E-07	3.54E+01	8.45E-07	5.24E+01	7.01E-07	5.24E+01
U-235	9.00E-01	1.29E-05	0.00E+00	2.47E-02	2.47E-02	1.90E-05	0.00E+00	3.66E-02	3.66E-02

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-288T UNKNOWN (TRU)

C. Code Name: 163

ANL-W ACL COLD-LINE ABSORBED LIQUID, MISC.,
HARDWARE AND PE**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 TRU trash and solidified liquids. Characterization activities are in progress.

Content Code Description:

There is no content information on this code, which was generated at INEL.

Total Volume (m3): 1.27

Gross Mass (kg): 490.00

Drum Equivalents: 6.00

Physical Form: SOLID

Physical Type: ABSORBENT MATERIALS, CONTAMINATED EQUIPMENT

PCBs: ☐

Combustibility:

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

Waste Type

☐ ALLW☐ ALLMW☐ TRUW☒ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-163

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	6	DRUM	1.27	490.00	ANL-W ACL COLD-LINE ABSORBED LIQUID, MISC., HARDWAR
Subtotal	6		1.27	490.00	

Total 6**1.27 m3****490.00 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 constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 $\leq$ nCi/g $<$ 500	3.50E+02	2.60E+02
3	1,000 $\leq$ nCi/g $<$ 2,000	6.60E+01	4.30E+01
7	5,000 $\leq$ nCi/g $<$ 6,000	7.50E+01	5.20E+01
Totals		4.91E+02	3.55E+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	9.58E+00	1.14E-04	7.08E+03	9.46E-05	7.08E+03	1.65E-04	1.02E+04	1.37E-04	1.02E+04
U-235	6.89E+01	8.88E-04	0.00E+00	1.71E+00	1.71E+00	1.28E-03	0.00E+00	2.45E+00	2.45E+00

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-163

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-200

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288T UNKNOWN (TRU)
C. Code/Name: 200 AMERICIUM SOURCES

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 TRU trash and solidified liquids. Characterization activities are in progress.

Content Code Description:

This waste stream was generated at the INEL. Additional information is not available at this time.

Total Volume (m3): .21

Gross Mass (kg): 23.00

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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-200

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	DRUM	0.21	23.00	AMERICIUM SOURCES
Subtotal	1	0.21	23.00	

Total 1**.21 m3****23.00 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 constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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	0.3
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	
		Lead (Bulk Pb)	
		Other HVPM(Zn,Cd)	0.0
	Misc. Non-Combustible -	Ceramic (molds)	
		Firebrick	
		Concrete	99.7
		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 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	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

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

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288T UNKNOWN (TRU)
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 TRU trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 4.14

Gross Mass (kg): 920.00

Drum Equivalents: 19.51

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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-202

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
3	DRUM	0.64	230.00	COMBUSTIBLE SOLIDS
1	BIN	3.50	690.00	COMBUSTIBLE SOLIDS
Subtotal	4	4.14	920.00	

Total 4**4.14 m3****920.00 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 constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nC/g < 500	1.20E+02	7.10E+01
2	500 <= nC/g < 1,000	9.50E+02	6.50E+02
4	2,000 <= nC/g < 3,000	6.00E+01	3.70E+01
Totals		1.13E+03	7.58E+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	1.18E+01	4.97E-05	3.08E+03	4.12E-05	3.08E+03	7.89E-05	4.89E+03	6.54E-05	4.89E+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
	Misc. Non-Combustible -	Lead (Bulk Pb)	
		Other HVPM (Zn, Cd)	0.0
		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	
	Inorganic Sludge -	Magnesia (insulations)	
		Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
		Aqueous Solutions	
		Leaded Rubber	2.4
<u>Partial Combustible</u> (10%-90% Combustible)	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	31.7
		Polyvinyl Chloride (PVC)	7.9
		Teflon	0.0
		Plexiglass	
<u>Combustibles</u> (>90% Combustible)	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/FT ³	4-1
PLASTIC (PLASTIC SUITS, NYLON REINF. PLASTIC)			4-1, 2
RUBBER (GLOVES, AIR HOSE)			4-1, 2
WOOD			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288T UNKNOWN (TRU)

C. Code/Name: 203 PAPER, METALS, GLASS

B. DESCRIPTION**INEL ID (V MIS) Description:**

This waste has been determined to have insufficient RCRA characterization information available to assign EPA hazardous waste codes. It consists mainly of contaminated TRU trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 5.51

Gross Mass (kg): 2,500.00

Drum Equivalents: 26.00

Physical Form: SOLID

Physical Type: PAPER, METALS, 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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-203

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
26	DRUM	5.51	2,500.00	PAPER, METALS, GLASS
Subtotal	26	5.51	2,500.00	

Total 26**5.51 m3****2,500.00 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)

UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCi/g < 500	1.10E+03	8.30E+02
2	500 <= nCi/g < 1,000	4.10E+02	3.20E+02
3	1,000 <= nCi/g < 2,000	5.90E+01	3.60E+01
4	2,000 <= nCi/g < 3,000	2.30E+02	1.70E+02
5	3,000 <= nCi/g < 4,000	1.10E+02	8.60E+01
6	4,000 <= nCi/g < 5,000	2.10E+02	1.60E+02
8	6,000 <= nCi/g < 7,000	2.50E+02	2.00E+02
10	8,000 <= nCi/g < 9,000	9.30E+01	7.00E+01

Totals

2.46E+03 1.87E+03

Alpha Activity Distribution

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	8.28E+01	4.56E-04	2.83E+04	3.78E-04	2.83E+04	5.94E-04	3.68E+04	4.92E-04	3.68E+04
U-235	1.23E+03	7.62E-03	0.00E+00	1.47E+01	1.47E+01	9.84E-03	0.00E+00	1.89E+01	1.89E+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	17.0
	Metals -	Carbon Steel	43.0
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	1.0
	Misc. Non-Combustible -	Lead (Bulk Pb)	6.0
		Other HVPM (Zn, Cd)	0.0
		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 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	5.6
		Polyvinyl Chloride (PVC)	1.4
		Teflon	0.0
		Plexiglass	
<u>Combustibles</u> (>90% Combustible)	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/FT ³	4-1
PAPER	50	% VOL	4-1, 2

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-204

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288T

UNKNOWN (TRU)

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 TRU trash and solidified liquids. Characterization activities are in progress.

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.

Total Volume (m3): .85

Gross Mass (kg): 971.00

Drum Equivalents: 4.00

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

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-204

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	4	DRUM	0.85	971.00	SOLIDIFIED SOLUTIONS
Subtotal	4		0.85	971.00	

Total 4**.85 m3****971.00 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 constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCvg < 500	4.60E+02	4.20E+02
13	20,000 <= nCvg < 30,000	2.70E+02	2.50E+02
Totals		7.30E+02	6.70E+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.

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	8.00E-01	1.73E-06	1.07E+02	1.43E-06	1.07E+02	1.92E-06	1.19E+02	1.59E-06	1.19E+02
PU-238	4.00E-01	1.48E-06	2.24E+04	1.08E+00	2.24E+04	1.61E-06	2.45E+04	1.18E+00	2.45E+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 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	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene Polyvinyl Chloride (PVC) Teflon Plexiglass	
	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

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288T UNKNOWN (TRU)

C. Code/Name: 801

PLASTIC, TYGON, MANIPULATOR BOOTS, ETC.

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 TRU trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 7.42

Gross Mass (kg): 2,100.00

Drum Equivalents: 35.00

Physical Form: SOLID

Physical Type: 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 is from Mound Laboratory and consists of various types of plastics (PVC, PE tygon, etc.) in the form of tubing, piping, sample vials, gaskets, manipulator, boots, etc. Limited amounts of other combustible wastes from content codes 801 and 802 may also be included. One drum contains content code 832, liquid mercury. The wastes are primarily from D&D activities at the plutonium processing and research buildings. Waste was shipped only in 1977. Limited amounts of waste may be damp.

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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23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-801

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	35	DRUM	7.42	2,100.00	PLASTIC, TYGON, MANIPULATOR BOOTS, ETC.
Subtotal	35		7.42	2,100.00	

Total 35**7.42 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)

UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
1	100 <= nCvg < 500	1.40E+02	1.10E+02
8	6,000 <= nCvg < 7,000	1.60E+02	1.30E+02
12	10,000 <= nCvg < 20,000	1.40E+02	1.20E+02
21	100,000 <= nCvg < 200,000	2.40E+02	1.40E+02
22	200,000 <= nCvg < 300,000	1.00E+03	5.80E+02
23	300,000 <= nCvg < 400,000	4.30E+02	2.20E+02
Totals		2.11E+03	1.30E+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.

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-238	2.76E+01	4.89E-05	7.43E+05	3.59E+01	7.43E+05	8.60E-05	1.31E+06	6.31E+01	1.31E+06
PU-83	4.43E-01	9.43E-06	1.20E+05	6.55E+00	1.20E+05	3.76E-05	4.78E+05	2.61E+01	4.79E+05

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			
	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	2.4	
		Organic Sludge		
		Uncemented Resin		
		Cemented Resin		
		Asphalt		
		Benelex/lead		
		Sheetrock		
	Plastics -	Polyethylene	31.7	
		Polyvinyl Chloride (PVC)	7.9	
		Teflon	0.0	
<u>Combustibles</u> (>90% Combustible)	Plexiglass			
	Rubber -	Rubber	1.3	
		Surgeons' Glove	7.7	
	Misc. Combustibles -	Graphite (molds)		
		Paper	28.2	
		Wood	2.4	
		Cardboard	7.2	
		Cloth	4.7	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
COMBUSTIBLES			4-1
MERCURY			4-1
PLASTIC (PVC, PE, TYGON)			4-1, 2

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288T UNKNOWN (TRU)

C. Code/Name: 815 CLASSIFIED PARTS

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 TRU trash and solidified liquids. Characterization activities are in progress.

Content Code Description:

There is no content information for this waste stream, which was generated at Mound Laboratory.

Total Volume (m3): .42

Gross Mass (kg): 97.00

Drum Equivalents: 2.00

Physical Form: SOLID

Physical Type: CONTAMINATED EQUIPMENT

PCBs: ☐

Combustibility:

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

Waste Type

☐ ALLW☐ ALLMW☐ TRUW☒ TRUMW

Rad. Level

☒ Contact-Handled☐ Remote-Handled

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-815

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	2	DRUM	0.42	97.00	CLASSIFIED PARTS
Subtotal	2		0.42	97.00	

Total 2**.42 m3****97.00 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 constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
13	20,000 <= nCi/g < 30,000	5.20E+01	2.90E+01
22	200,000 <= nCi/g < 300,000	4.50E+01	2.20E+01
Totals		9.70E+01	5.10E+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.

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-238	8.00E-01	1.75E-05	2.66E+05	1.28E+01	2.66E+05	3.48E-05	5.29E+05	2.55E+01	5.29E+05

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-288T UNKNOWN (TRU)
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 TRU trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 4.24

Gross Mass (kg): 2,300.00

Drum Equivalents: 20.00

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 nonlinear 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/ft³ 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.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-847

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	20	DRUM	4.24	2,300.00	LSA < 100 nCi/g COMBUSTIBLE
Subtotal	20		4.24	2,300.00	

Total 20**4.24 m3****2,300.00 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)

UNKNOWN, WASTE MAY CONTAIN DXXX AND FXXX CONSTITUENTS

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
11	9,000 <= nCi/g < 10,000	3.20E+02	2.80E+02
12	10,000 <= nCi/g < 20,000	6.20E+02	5.30E+02
13	20,000 <= nCi/g < 30,000	3.50E+02	2.80E+02
14	30,000 <= nCi/g < 40,000	2.40E+02	1.90E+02
15	40,000 <= nCi/g < 50,000	3.60E+02	2.70E+02
16	50,000 <= nCi/g < 60,000	2.20E+02	1.80E+02
17	60,000 <= nCi/g < 70,000	1.50E+02	1.20E+02
19	80,000 <= nCi/g < 90,000	1.60E+02	1.40E+02
21	100,000 <= nCi/g < 200,000	9.00E+01	6.70E+01
Totals		2.51E+03	2.06E+03

Alpha Activity Distribution

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-238	6.00E+00	2.98E-05	4.54E+05	2.19E+01	4.54E+05	3.74E-05	5.68E+05	2.74E+01	5.68E+05

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	
	Partially Combustible -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	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

A. IDENTIFICATION

INEL ID/Name: ID-EGG-288T UNKNOWN (TRU)

C. Code/Name: 848 LSA < 100 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 TRU trash and solidified liquids. Characterization activities are in progress.

Total Volume (m3): 1.27

Gross Mass (kg): 580.00

Drum Equivalents: 6.00

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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-288T-848

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
6	DRUM	1.27	580.00	LSA < 100 nC/g NONCOMBUSTIBLE
Subtotal	6	1.27	580.00	

Total 6**1.27 m3****580.00 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 constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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)
13	20,000 <= nCvg < 30,000	1.00E+02	8.00E+01
17	60,000 <= nCvg < 70,000	1.60E+02	1.10E+02
21	100,000 <= nCvg < 200,000	6.90E+01	4.60E+01
22	200,000 <= nCvg < 300,000	1.10E+02	8.70E+01
28	800,000 <= nCvg < 900,000	9.20E+01	6.90E+01
Totals		5.31E+02	3.92E+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	1.00E+00	1.09E-05	6.74E+02	9.01E-06	6.74E+02	1.44E-05	8.95E+02	1.20E-05	8.95E+02
PU-238	8.59E+00	8.63E-05	1.31E+06	6.34E+01	1.31E+06	1.15E-04	1.76E+06	8.47E+01	1.76E+06

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-dn	
		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	14.3
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	1.6
		Polyvinyl Chloride (PVC)	0.4
		Tellon	0.0
		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	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

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INEL Waste Profile Sheet

TRUMW

ID-EGG-291T-*

A. IDENTIFICATION

INEL ID/Name: ID-EGG-291T TRU HEAVY METAL SLUDGE

C. Code/Name: *

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

The waste stream was sludge generated from 4 catch tanks that were removed from service. The sludge was generated from activity in the TRA Hot Cell and the TRA Chemistry Laboratories. This was generated only "one time."

Total Volume (m3): 2.08

Gross Mass (kg): 1,071.84

Drum Equivalents: 9.82

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

TRUMW

ID-EGG-291T-*

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
		2.08	1,071.84	
Subtotal		2.08	1,071.84	

Total**2.08 m3****1,071.84 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)
D006	CADMIUM		7440-43-9		
D007	CHROMIUM		7440-47-32		
D008	LEAD		7439-92-1		
D009	MERCURY	ELEMENTAL MERCURY CONTAMINATED WITH RADIOACTIVE MATERIALS	7439-97-6		
D011	SILVER		7440-22-4		

When no constituents are listed, refer to Section 3.7 of this report. Also, no concentration data are provided for TRUMW, refer to the ALLMW report for information on similar constituents.

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.

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INEL Waste Profile Sheet

TRUMW

ID-EGG-291T-*

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**

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

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
CADMIUM	5	PPM	4-6
CHROMIUM	39	PPM	4-6
LEAD	40	PPM	4-6
MERCURY	29400	PPM	4-6
SILVER	10	PPM	4-6
SLUDGE	99	% WT	4-6

4.28 References

- 4-1. IMWI Reference No. 1. W. S. Roesener et al., Identification of a Treatment Process for the Idaho Waste Processing Facility Project—A Preconceptual Design Study. WM-PD-92-009, September 1992.
- 4-2. IMWI Reference No. 2. K. P. Guay, T. L. Clements, Jr., EPA Hazardous Waste Codes Found in INEL Stored TRU Waste Content Codes, EDF-RWMC-421 Revision 1, February 23, 1991.
- 4-3. IMWI Reference No. 3. U.S. DOE, Federal Facilities Compliance Act 180 Day Report, Appendix 13, Waste Profile Data Sheets, April 1993.
- 4-4. IMWI Reference No. 4. Waste Management Information System, Oak Ridge National Laboratory, Input Data Sheets from Argonne National Laboratory-West, December 11, 1992.
- 4-5. IMWI Reference No. 5. Waste Management Information System, Oak Ridge National Laboratory, Input Data Sheets from Samuel Pole, December 9, 1992.
- 4-6. IMWI Reference No. 6. Waste Management Information System, Oak Ridge National Laboratory, Input Data Sheets from EG&G Idaho, handwritten markups, December 1992.
- 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.
- 4-8. IMWI Reference No. 8. Waste Management Information System, Oak Ridge National Laboratory, Input Data Sheets from Babcock and Wilcox, handwritten markups, December 1992, March 1993.
- 4-9. IMWI Reference No. 9. Waste Management Information System, Oak Ridge National Laboratory, Input Data Sheets from WINCO, handwritten markups, February 1993.
- 4-10. IMWI Reference No. 10. Listed Waste Determination Report (Draft), WINCO, December 1992.
- 4-11. IMWI Reference No. 11. EG&G Form 669, Generator's Hazardous Waste Material Profile Sheet, EG&G Idaho.
- 4-12. IMWI Reference No. 12. EG&G Form 669, Generator's Hazardous Waste Material Profile Sheet, EG&G Idaho, Rev. September 1985.
- 4-13. IMWI Reference No. 13. EG&G Form 669, Generator's Hazardous Waste Material Profile Sheet, EG&G Idaho, Rev. June 1987.

- 4-14. IMWI Reference No. 14. EG&G Form 669, Generator's Hazardous Waste Material Profile Sheet, EG&G Idaho, March 1991.
- 4-15. IMWI Reference No. 15. EG&G Form 669A, Hazardous Radioactive Mixed Waste Packaging Requirements, EG&G Idaho, September 1985.
- 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.
- 4-18. IMWI Reference No. 18. EG&G Form 112B, Radioactive Shipment Truck Survey Sheet, EG&G Idaho, February 1977.
- 4-19. IMWI Reference No. 19. D. R. Tyson, Treatment Study of Scintillation Cocktails Generated from TRA (WERF Code ID #55-91), WROC-EDF-113, February 17, 1992.
- 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.
- 4-21. IMWI Reference No. 21. D. R. Tyson, Treatment Study of Freon Decontamination Waste Generated from TRA (WERF Code ID #56-91), WROC-EDF-106, January 30, 1992.
- 4-22. IMWI Reference No. 22. D. R. Tyson, Treatment Study of Mercury Contaminated Debris and Asbestos Waste Generated from WERF (WERF Code ID #66-91) (Draft) WROC-EDF-121.
- 4-23. IMWI Reference No. 23. D. R. Tyson, Treatment Study of Uranium Spiked Lead Waste Generated from WERF (WERF Code ID #65-911) (Draft).
- 4-24. IMWI Reference No. 24. D. R. Tyson, Treatment Study of Liquid Freon Waste Generated from TRA (WERF Code ID #72-91), WROC-EDF-108, January 30, 1992.
- 4-25. IMWI Reference No. 25. D. R. Tyson, Treatment Study of Grease/Carburetor Cleaner Generated from RWMC (WERF Code ID #77-91), WROC-EDF-109, January 28, 1992.
- 4-26. IMWI Reference No. 26. D. R. Tyson, Treatment Study of Diatomaceous Earth with Grease and Cleaner Waste from RWMC (WERF Code ID #78-91) (Draft).
- 4-27. IMWI Reference No. 27. D. R. Tyson, LDR MW Characterization and Categorization EDF, EDF-058, January 2, 1991.
- 4-28. IMWI Reference No. 28. D. R. Tyson, Treatment Study of Clean-up Water Containing Trichloroethylene from TAN (WERF Code ID #51-91), WROC-EDF-104, January 16, 1992.

- 4-29. IMWI Reference No. 29. E. C. Garcia, Planning Report for Treatment of LDR Mixed Wastes, EDF-062 (Draft).
- 4-30. IMWI Reference No. 30. DOE Form ID F.5480.1B, U.S. DOE On-Site Radioactive Material Shipment Record, DOE, May 1983.
- 4-31. IMWI Reference No. 31. DOE Form ID F 5480.1A, U.S. DOE Off-Site Radioactive Material Shipment Record, DOE, July 1983.
- 4-32. IMWI Reference No. 32. DOE Form ID F 5480.3A, U.S. DOE Hazardous Material Shipping Record, DOE, March 1991.
- 4-33. IMWI Reference No. 33. DOE Form ID F 5820.2, Stored, Disposed, or Processed Solid Radioactive Waste Form, DOE, November 1985.
- 4-34. IMWI Reference No. 34. DOE Form ID F 5820.2, Stored, Disposed, or Processed Solid Radioactive Waste Form, DOE, February 2, 1987.
- 4-35. IMWI Reference No. 35. Labelmaster Form F15REV-6 (Form approved. OMB No. 2050-0039), Uniform Hazardous Waste Manifest.
- 4-36. IMWI Reference No. 36. Notification of Waste Subject to Land Disposal Restrictions, EG&G Idaho.
- 4-37. IMWI Reference No. 37. Treatment, storage, and disposal capabilities database survey form (write-on).
- 4-38. IMWI Reference No. 38. Data Chem form EPRW-B, Environmental Water Report (Analytical Results).
- 4-39. IMWI Reference No. 39. EG&G Idaho, "Mixed and Low-Level Waste Treatment Facility Project—Appendix B—Waste Stream Engineering Files Part 1, Mixed Waste Streams," EGG-WMO-10244, September 1992.
- 4-40. IMWI Reference No. 40. R. D. Falconer, EPA Hazardous Waste Codes Found in INEL Stored TRU Waste Content Codes, EDF-RWMC-41 Revision 2, June 30, 1993.
- 4-41. IMWI Reference No. 41 was not used in the Profile Sheets in this report.
- 4-42. IMWI Reference No. 42. Letter from C. R. Edinborough, EG&G Idaho, to C. M. Barnes, EG&G Idaho, "ERDP 2802 Final Report," CRE-03-90, August 15, 1990.
- 4-43. IMWI Reference No. 43. L. G. Gale, "Characterization of Incoming Waste," EDF-IWPF-0021, January 7, 1993.
- 4-44. IMWI Reference No. 44. Radioactive Waste Management Information System (RWMIS), EG&G Idaho, Idaho Falls, Idaho, June 1993.

- 4-45. IMWI Reference No. 45. C. J. Barnard, "Inventory Analysis of Stored Transuranic (TRU) Waste at the RWMC," WM-PD-90-003 Rev. 1, Table A-2, June 30, 1993 (Draft).
- 4-46. IMWI Reference No. 46 was not used in the Profile Sheets in this report.
- 4-47. IMWI Reference No. 47. Code of Federal Regulations, 40 CFR 268, "Land Disposal Restriction," Office of the Federal Register, July 1, 1992.
- 4-48. Ravio, B. D., D. D. Pace, *Preliminary EPA Hazardous Constituents Design Basis Concentrations for ALLW Treatment Services*, EOF PSPI-01554G-04, January 18, 1994.
- 4-49. Argyle, M. D., A. L. Rubert, J. C. Tozer, L. Meikle, *INEL Radioactive Waste Stream Characterization Data (DRAFT), Volume 3 Mixed and Non-Mixed Alpha-Low-Level Waste (ALLW)*, EGG-WM-10909, August 1993.
- 4-50. Gratson M. W., "Hazardous Stored Waste Source Term For the RWMC's TSA," Letter to J. J. Riedesel, MWG-05-90, with Attachment "Hazardous Stored TRU Waste Source Term For The RWMC's TSA," EDF-ENV-003, February 5, 1990.
- 4-51. Kudera, D. E., *Hazardous Waste Constituents of INEL Contact-Handled Stored Transuranic Waste*, EDF RWMC-369, dated May 19, 1989.
- 4-52. Falconer, R. D., *EPA Hazardous Waste Codes Found In INEL Stored Waste Content Codes*, EDF RWMC-421, Rev. 2, dated June 30, 1993, information as integrated into the Reference 4-1 (IMWI) database and report.
- 4-53. Falconer, R. D., *Estimation of Polychlorinated Biphenyl (PCB)-Contaminated Waste Stored In the Transuranic Storage Area (TSA)*, EDF RWMC-604, dated June 3, 1993.
- 4-54. Schafer, J. J., Answers to R. Rothman Data Request For Inclusion Of A Private Sector Alpha Low-Level Waste Treatment Facility In the INEL ER&WM EIS, Attachment to JJS-05-93, in response to a letter from P. J. Smith, PJS-21-93, dated October 12, 1993.
- 4-55. Ayers, A. L., *Preliminary Evaluation of Data Needs for Design of and Shipping to an ALLW Treatment Facility*, EDF PSPI-015546-02, dated December 21, 1993.
- 4-56. Gale, L. G., *Estimated Waste Matrix Compositions of ALLW for Treatment Design Basis*, EG&G EDF IWPF-0047, February 1994.
- 4-57. 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.

5. TRANSURANIC WASTE PROFILE SHEETS

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102TN UNCEMENTED INORGANIC SLUDGE (TRU)

C. Code/Name: 995 SLUDGE

B. DESCRIPTION

INEL ID (WMIS) Description:

Non hazardous TRU waste.

Total Volume (m3): 19.29

Gross Mass (kg): 19,800.00

Drum Equivalents: 91.00

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. 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.

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INEL Waste Profile Sheet

TRUW

ID-EGG-102TN-995

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	91	DRUM	19.29	19,800.00	SLUDGE
Subtotal	91		19.29	19,800.00	

Total 91**19.29 m3****19,800.00 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 Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
1	100 <= nCi/g < 500	1.50E+04	1.30E+04
Totals		1.50E+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.

Alpha Activity Distribution

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INEL Waste Profile Sheet

TRUW

ID-EGG-102TN-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	5.70E+01	3.83E-06	3.06E+02	1.61E-02	3.06E+02	4.40E-06	3.51E+02	1.85E-02	3.51E+02

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		
		Shaetrock		
		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, PLUTONIUM RECOVERY SLUDGE)			4-1

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INEL Waste Profile Sheet

TRUW

ID-EGG-102TN-995

A. IDENTIFICATION

INEL ID/Name: ID-EGG-114TN COMBUSTIBLES (TRU)

C. Code/Name: 804 PLASTIC, TYGON, MANIPULATOR BOOTS, ETC.

B. DESCRIPTION

INEL ID (WMIS) Description:

Non hazardous TRU waste.

Total Volume (m3): 46.64

Gross Mass (kg): 11,220.00

Drum Equivalents: 220.00

Physical Form: SOLID

Physical Type: PLATIC, 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 is from Mound Laboratory and consists of various types of plastics (PVC, PE tygon, etc.) in the form of tubing, piping, sample vials, gaskets, manipulator, boots, etc. Limited amounts of other combustible wastes from content codes 801, and 802 may also be included. One drum contains content code 832, liquid mercury. The wastes are primarily from D&D activities at the plutonium processing and research buildings. Waste was shipped only in 1977. Limited amounts of waste may be damp.

The waste is WIPP certifiable. Organic material in the waste is subject to gas generation. The average waste organic material content usually exceeds 14 lb/ft³ for drums. Levels of fines from glove box cleaning should be within compressed gases, pyrophoric, toxic, or corrosive materials.

Combustibles were packed into 1 gallon plastic coated cardboard cartons. Each carton was labeled, assayed and bagged into a sleeve bag which holds 5 cartons. Up to eight sleeve bags were placed in each drum. Drums were prepared according to post-1972 procedures.

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INEL Waste Profile Sheet

TRUW

ID-EGG-114TN-804

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
220	DRUM	46.64	11,220.00	PLASTIC, TYGON, MANIPULATOR BOOTS, ETC.
Subtotal	220	46.64	11,220.00	

Total 220**46.64 m3****11,220.00 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)
19	80,000 <= nC/g < 90,000	9.00E+01	6.70E+01
21	100,000 <= nC/g < 200,000	1.30E+03	8.80E+02
22	200,000 <= nC/g < 300,000	5.20E+03	3.00E+03
23	300,000 <= nC/g < 400,000	4.30E+03	2.10E+03
30	1,000,000 <= nC/g < 2,500,000	7.40E+01	5.10E+01
31	2,500,000 <= nC/g < 5,000,000	3.10E+02	1.70E+02
Totals		1.13E+04	6.27E+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.

Alpha Activity Distribution

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INEL Waste Profile Sheet

TRUW

ID-EGG-114TN-804

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-238	2.73E+02	4.16E-04	6.33E+06	3.06E+02	6.33E+06	6.94E-04	1.05E+07	5.09E+02	1.06E+07

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	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 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	33.4
		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
<u>Combustibles</u> (>90% Combustible)		Cloth	1.0

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
MERCURY			4-1
ORGANICS	14	LB/FT3	4-1
PLASTIC (PVC, PE, TYGON)			4-1

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INEL Waste Profile Sheet

TRUW

ID-EGG-114TN-804

A. IDENTIFICATION

INEL ID/Name: ID-EGG-115TN CONCRETE - BRICK (TRU)

C. Code/Name: 960 CONCRETE, ASPHALT, ETC.

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

Non hazardous TRU waste.

Total Volume (m3): 9.75

Gross Mass (kg): 8,900.00

Drum Equivalents: 46.00

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, 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

TRUW

ID-EGG-115TN-960

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	46	DRUM	9.75	8,900.00	CONCRETE, ASPHALT, ETC.
Subtotal	46		9.75	8,900.00	

Total 46**9.75 m3****8,900.00 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 Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
1	100 <= nCi/g < 500	5.00E+03	4.50E+03
2	500 <= nCi/g < 1,000	1.80E+03	1.60E+03
3	1,000 <= nCi/g < 2,000	7.20E+02	5.80E+02
5	3,000 <= nCi/g < 4,000	2.40E+02	2.10E+02
6	4,000 <= nCi/g < 5,000	1.40E+02	9.40E+01
7	5,000 <= nCi/g < 6,000	1.80E+02	1.40E+02
8	6,000 <= nCi/g < 7,000	1.80E+02	1.40E+02
12	10,000 <= nCi/g < 20,000	3.70E+02	2.70E+02
16	50,000 <= nCi/g < 60,000	2.10E+02	1.70E+02

Totals

8.84E+03

7.70E+03

Alpha Activity Distribution

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.

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	3.22E+02	1.17E-03	9.30E+04	4.89E+00	9.30E+04	1.51E-03	1.21E+05	6.35E+00	1.21E+05

WASTE MATRIX CONSTITUENTS

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
COMBUSTIBLES			4-1
OTHER (CONCRETE AND ASPHALT)			4-1
SOIL			4-1

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INEL Waste Profile Sheet

TRUW

ID-EGG-115TN-960

A. IDENTIFICATION

INEL ID/Name: ID-EGG-118TN FILTERS (TRU)

C. Code/Name: 361 INSULATION HEELS

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

Non hazardous TRU waste.

Total Volume (m3): .21

Gross Mass (kg): 190.00

Drum Equivalents: 1.00

Physical Form: SOLID

Physical Type: FILTERS, 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 insoluble residue (heel) of filter media and insulation from HF and HNO₃ washing procedures to recover plutonium. This single drum of this waste was received in 1972.

The waste cannot be certified (for WIPP) due to likelihood of excessive fines. Gas generation should be negligible, since this waste is inorganic. The organic material, excluding the 90 mil drum liner, is less than 20 lb (2.7 lb/ft³). Significant amounts of 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.

There is only one drum of this waste. The waste is packaged in volkrath stainless steel cans and/or 1/2- or 1-gallon PE bottles. Depending on when the waste was generated, the drum was packed according to the usual pre-1972 and post 1972 procedures. The drum was assayed.

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INEL Waste Profile Sheet

TRUW

ID-EGG-118TN-361

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	DRUM	0.21	190.00	INSULATION HEELS
Subtotal: 1		0.21	190.00	

Total 1	.21 m3	190.00 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 Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
19	80,000 <= nCi/g < 90,000	1.90E+02	1.40E+02
Totals		1.90E+02	1.40E+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

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	1.99E+02	1.07E-03	8.52E+04	4.48E+00	8.52E+04	1.42E-03	1.13E+05	5.94E+00	1.13E+05

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)	10.0
	Misc. Non-Combustible -	Ceramic (molds) Firebrick Concrete Portland Cement Dir/Soil Ash Oil-dri Vermiculite Salts	4.0
	Filters/Insulation -	Glass Filter Media Asbestos (filter, insulation) Filter Dust Magnesia (insulations)	39.5 39.5
	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 Polyvinyl Chloride (PVC) Teflon Plexiglass	5.6 1.4 0.0
	Rubber -	Rubber Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds) Paper Wood Cardboard Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
FILTERS (INSOL. FILTER MEDIA RESIDUE & INSULATION)			4-1
ORGANICS	2.7	LB/FT3	4-1

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-118TN-361

A. IDENTIFICATION

INEL ID/Name: ID-EGG-132TN METALS (TRU)

C. Code/Name: 416

ZINC MAGNESIUM ALLOY METAL

B. DESCRIPTION

INEL ID (WMIS) Description:

Non hazardous TRU waste.

Total Volume (m3): .21

Gross Mass (kg): 220.00

Drum Equivalents: 1.00

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 come from the Rocky Flats Plant. It consists of one lead-lined drum of small billets of zinc-magnesium alloy metal used in a research and development salt cleanup project. The billets are individually packaged in a produce can and sealed with a roll seam. Each can is contained in two plastic bags and then placed in a stainless steel can. Approximately 50 stainless steel cans are loaded in a single drum. The waste is TRU and should be certifiable (for WIPP).

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INEL Waste Profile Sheet

TRUW

ID-EGG-132TN-416

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	DRUM	0.21	220.00	ZINC MAGNESIUM ALLOY METAL
Subtotal	1	0.21	220.00	

Total 1**.21 m3****220.00 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)
25	500,000 <= nCi/g < 600,000	2.20E+02	2.00E+02
Totals		2.20E+02	2.00E+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.

Alpha Activity Distribution

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)
AM-241	3.10E+01	1.41E-04	4.73E+05	8.47E-05	4.73E+05	1.58E-04	5.27E+05	9.45E-05	5.27E+05
PU-52	1.70E+02	7.74E-04	6.18E+04	3.25E+00	6.18E+04	8.64E-04	6.89E+04	3.62E+00	6.89E+04

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	3.0
		Stainless Steel	3.0
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	91.0
	Misc. Non-Combustible -	Lead (Bulk Pb)	
		Other HVPM (Zn, Cd)	0.0
		Ceramic (molds)	
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dn	
		Vermiculite	1.0
		Salts	
		Glass Filter Media	
<u>Partial Combustible</u> (10%-90% Combustible)	Filters/Insulation -	Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
		Sludge High Na ₂ O (1st Stage)	
		Sludge High CaO (2nd Stage)	
	Inorganic Sludge -	Aqueous Solutions	
		Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
	Partially Combustible -	Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
		Polyethylene	1.6
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyvinyl Chloride (PVC)	0.4
		Teflon	0.0
		Plaxiglass	
		Rubber	
	Rubber -	Surgeons' Glove	
		Graphite (molds)	
	Misc. Combustibles -	Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
METAL (ZINC MAGNESIUM ALLOY, STAINLESS STEEL CAN)			4-1

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INEL Waste Profile Sheet

TRUW

ID-EGG-132TN-416

A. IDENTIFICATION

INEL ID/Name: ID-EGG-134TN MISCELLANEOUS(PAPER,METAL, ETC.) (TRU)

C. Code Name: 825

NONCOMBUSTIBLE EQUIPMENT DRUMS

B. DESCRIPTION

INEL ID (WMIS) Description:

Non hazardous TRU waste.

Total Volume (m3): 66.48

Gross Mass (kg): 24,100.00

Drum Equivalents: 313.58

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.

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INEL Waste Profile Sheet

TRUW

ID-EGG-134TN-825

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
179	DRUM	37.95	15,900.00	NONCOMBUSTIBLE EQUIPMENT DRUMS
9	BOX	28.53	8,200.00	NONCOMBUSTIBLE EQUIPMENT DRUMS
Subtotal	188	66.48	24,100.00	

Total 188**66.48 m3****24,100.00 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 Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
1	100 <= nCi/g < 500	1.30E+03	9.10E+02
2	500 <= nCi/g < 1,000	1.10E+02	6.30E+01
3	1,000 <= nCi/g < 2,000	8.70E+03	6.20E+03
4	2,000 <= nCi/g < 3,000	2.60E+02	2.00E+02
5	3,000 <= nCi/g < 4,000	1.00E+03	7.10E+02
6	4,000 <= nCi/g < 5,000	6.20E+01	3.20E+01
7	5,000 <= nCi/g < 6,000	1.70E+02	7.80E+01
11	9,000 <= nCi/g < 10,000	1.70E+02	1.40E+02
12	10,000 <= nCi/g < 20,000	4.90E+02	4.00E+02
13	20,000 <= nCi/g < 30,000	1.30E+03	1.00E+03
14	30,000 <= nCi/g < 40,000	9.40E+02	6.50E+02
15	40,000 <= nCi/g < 50,000	1.50E+03	1.00E+03
16	50,000 <= nCi/g < 60,000	8.50E+02	5.70E+02
17	60,000 <= nCi/g < 70,000	9.40E+02	6.30E+02
18	70,000 <= nCi/g < 80,000	6.70E+02	4.80E+02
19	80,000 <= nCi/g < 90,000	7.30E+01	5.00E+01
20	90,000 <= nCi/g < 100,000	1.90E+02	1.20E+02
21	100,000 <= nCi/g < 200,000	2.60E+03	2.10E+03
22	200,000 <= nCi/g < 300,000	1.30E+03	9.70E+02
23	300,000 <= nCi/g < 400,000	7.40E+02	5.80E+02
24	400,000 <= nCi/g < 500,000	6.40E+02	5.10E+02
25	500,000 <= nCi/g < 600,000	4.90E+02	3.70E+02
26	600,000 <= nCi/g < 700,000	4.50E+02	3.60E+02
27	700,000 <= nCi/g < 800,000	7.30E+02	5.70E+02
28	800,000 <= nCi/g < 900,000	8.20E+01	5.90E+01
30	1,000,000 <= nCi/g < 2,500,000	4.00E+02	2.50E+02
31	2,500,000 <= nCi/g < 5,000,000	1.10E+02	6.20E+01
Totals		2.63E+04	1.91E+04

Alpha Activity Distribution

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INEL Waste Profile Sheet

TRUW

ID-EGG-134TN-825

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.

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	3.52E+02	1.06E-03	6.57E+04	8.79E-04	6.57E+04	1.59E-03	9.86E+04	1.32E-03	9.86E+04
PU-238	2.17E+02	5.86E-04	8.91E+06	4.30E+02	8.91E+06	8.68E-04	1.32E+07	6.37E+02	1.32E+07
PU-240	2.00E+01	3.77E-04	8.55E+04	3.89E-02	8.55E+04	6.60E-04	1.50E+05	6.79E-02	1.50E+05
PU-52	5.28E-01	1.61E-06	1.28E+02	6.73E-03	1.28E+02	2.55E-06	2.03E+02	1.07E-02	2.03E+02
PU-83	3.04E+01	3.33E-04	4.24E+06	2.31E+02	4.24E+06	7.49E-04	9.53E+06	5.21E+02	9.53E+06

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	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				
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				
Benelex/lead				
Sheetrock				
Plastics -		Polyethylene	0.4	
	Polyvinyl Chloride (PVC)	0.1		
	Teflon	0.0		
	Plexiglass			
Rubber -	Rubber			
	Surgeons' Glove			
Misc. Combustibles -	Graphite (molds)			
	Paper	1.8		
	Wood	3.2		
	Cardboard	3.2		
	Cloth			
<u>Combustibles</u> (>90% Combustible)				

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/FT3	4-1
OTHER (CONCRETE, FLOOR TILE, LADDERS)			4-1
OTHER (VACUUM SWEEPER FILTERS, SWEEPER HOSE)			4-1

A. IDENTIFICATION

INEL ID/Name: ID-EGG-137TN NONMETAL MOLDS AND CRUCIBLES (TRU)

C. Code/Name: 115

CERTIFIED TRU GRAPHITE WASTE

B. DESCRIPTION

INEL ID (WMIS) Description:

Non hazardous TRU waste.

Total Volume (m3): 66.78

Gross Mass (kg): 33,500.00

Drum Equivalents: 315.00

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.

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-115

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	315	DRUM	66.78	33,500.00	CERTIFIED TRU GRAPHITE WASTE
Subtotal	315		66.78	33,500.00	

Total 315

66.78 m3

33,500.00 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 Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
2	500 <= nCi/g < 1,000	2.00E+02	1.40E+02
3	1,000 <= nCi/g < 2,000	1.20E+02	9.00E+01
4	2,000 <= nCi/g < 3,000	5.90E+01	2.90E+01
5	3,000 <= nCi/g < 4,000	3.40E+02	2.50E+02
6	4,000 <= nCi/g < 5,000	9.00E+02	6.50E+02
7	5,000 <= nCi/g < 6,000	8.60E+02	6.10E+02
8	6,000 <= nCi/g < 7,000	5.90E+02	4.00E+02
9	7,000 <= nCi/g < 8,000	1.70E+03	1.20E+03
10	8,000 <= nCi/g < 9,000	1.10E+03	8.10E+02
11	9,000 <= nCi/g < 10,000	1.60E+03	1.10E+03
12	10,000 <= nCi/g < 20,000	1.20E+04	8.60E+03
13	20,000 <= nCi/g < 30,000	5.40E+03	3.90E+03
14	30,000 <= nCi/g < 40,000	2.20E+03	1.60E+03
15	40,000 <= nCi/g < 50,000	3.30E+03	2.40E+03
16	50,000 <= nCi/g < 60,000	1.90E+03	1.30E+03
17	60,000 <= nCi/g < 70,000	1.00E+03	7.50E+02
18	70,000 <= nCi/g < 80,000	1.30E+02	1.00E+02
Totals		3.34E+04	2.39E+04

Alpha Activity Distribution

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.

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	9.45E+03	4.52E-03	3.60E+05	1.89E+01	3.60E+05	6.25E-03	4.98E+05	2.62E+01	4.98E+05
U-235	3.60E+01	2.74E-04	0.00E+00	5.26E-01	5.26E-01	3.98E-04	0.00E+00	7.65E-01	7.65E-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-dn	1.3
		Vermiculite	5.0
		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	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	1.9
		Polyvinyl Chloride (PVC)	0.5
		Teflon	0.0
<u>Combustibles</u> (>90% Combustible)		Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	89.3
		Paper	2.1
		Wood	
		Cardboard	
		Cloth	

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

TRUW

ID-EGG-137TN-115

A. IDENTIFICATION

INEL ID/Name: ID-EGG-137TN NONMETAL MOLDS AND CRUCIBLES (TRU)

C. Code/Name: 303 SCARFED GRAPHITE CHUNKS

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

Non hazardous TRU waste.

Total Volume (m3): 12.30

Gross Mass (kg): 6,600.00

Drum Equivalents: 58.00

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 information on content code 303, except that no hazardous wastes should be expected. This waste stream may be chunks of scarfed graphite molds, which had below-discard levels of plutonium and so were not acid leached or further processed. Some fines are expected. It is likely that most of the waste stream is certifiable (for WIPP). Further information on this stream is necessary to verify these assumptions.

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INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-303

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	58	DRUM	12.30	6,600.00	SCARFED GRAPHITE CHUNKS
Subtotal	58		12.30	6,600.00	

Total 58

12.30 m3

6,600.00 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 Radionuclide and Alpha Activity Concentration Information

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	8.60E+01	6.30E+01
4	2,000 <= nCi/g < 3,000	3.40E+02	2.60E+02
5	3,000 <= nCi/g < 4,000	1.20E+02	9.00E+01
6	4,000 <= nCi/g < 5,000	1.00E+02	7.70E+01
7	5,000 <= nCi/g < 6,000	3.60E+02	2.70E+02
8	6,000 <= nCi/g < 7,000	3.60E+02	2.80E+02
9	7,000 <= nCi/g < 8,000	2.80E+02	2.00E+02
10	8,000 <= nCi/g < 9,000	1.20E+02	9.70E+01
11	9,000 <= nCi/g < 10,000	3.50E+02	2.70E+02
12	10,000 <= nCi/g < 20,000	2.70E+03	2.10E+03
13	20,000 <= nCi/g < 30,000	8.80E+02	6.60E+02
14	30,000 <= nCi/g < 40,000	2.20E+02	1.70E+02
15	40,000 <= nCi/g < 50,000	3.50E+02	2.80E+02
16	50,000 <= nCi/g < 60,000	3.40E+02	2.70E+02

Totals

6.61E+03 5.09E+03

Alpha Activity Distribution

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.

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)
AM-241	5.42E-01	1.87E-06	6.26E+03	1.12E-06	6.26E+03	2.42E-06	8.10E+03	1.45E-06	8.10E+03
PU-52	1.44E+03	2.75E-03	2.19E+05	1.15E+01	2.20E+05	3.53E-03	2.82E+05	1.48E+01	2.82E+05

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 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.
OTHER (SCARFED GRAPHITE MOLDS)			4-1

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-303

A. IDENTIFICATION

INEL ID/Name: ID-EGG-137TN NONMETAL MOLDS AND CRUCIBLES (TRU)

C. Code/Name: 310

GRAPHITE SCARFINGS

B. DESCRIPTION

INEL ID (WMIS) Description:

Non hazardous TRU waste.

Total Volume (m3): 3.39

Gross Mass (kg): 1,700.00

Drum Equivalents: 16.00

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.

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-310

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
16	DRUM	3.39	1,700.00	GRAPHITE SCARFINGS
Subtotal	16	3.39	1,700.00	

Total 16**3.39 m3****1,700.00 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 Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
2	500 <= nCi/g < 1,000	3.30E+02	2.60E+02
3	1,000 <= nCi/g < 2,000	2.10E+02	1.70E+02
4	2,000 <= nCi/g < 3,000	4.30E+02	3.40E+02
5	3,000 <= nCi/g < 4,000	4.40E+02	3.50E+02
7	5,000 <= nCi/g < 6,000	1.00E+02	8.00E+01
13	20,000 <= nCi/g < 30,000	1.20E+02	9.30E+01
21	100,000 <= nCi/g < 200,000	6.90E+01	4.60E+01
Totals		1.70E+03	1.34E+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.

Alpha Activity Distribution

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-310

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	2.22E+02	2.52E-03	2.01E+05	1.06E+01	2.01E+05	3.64E-03	2.90E+05	1.53E+01	2.90E+05

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
		Ceramic (molds)	
	Misc. Non-Combustible -	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	
		Leaded Rubber	
	Partially Combustible -	Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	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-DRI)			4-1
ABSORBENT (VERMICULITE)			4-1
OTHER (GRAPHITE SCARFINGS, CARBON POWDER GRANULES)			4-1

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INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-310

A. IDENTIFICATION

INEL ID/Name: ID-EGG-137TN NONMETAL MOLDS AND CRUCIBLES (TRU)

C. Code/Name: 311

GRAPHITE HEELS

B. DESCRIPTION

INEL ID (WMIS) Description:

Non hazardous TRU waste.

Total Volume (m3): 4.44

Gross Mass (kg): 1,790.00

Drum Equivalents: 20.95

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.

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INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-311

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
6	DRUM	1.27	908.00	GRAPHITE HEELS
1	BOX	3.17	882.00	GRAPHITE HEELS
Subtotal	7	4.44	1,790.00	

Total 7**4.44 m3****1,790.00 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)
3	1,000 <= nCi/g < 2,000	8.80E+02	6.00E+02
17	60,000 <= nCi/g < 70,000	2.40E+02	1.90E+02
18	70,000 <= nCi/g < 80,000	2.10E+02	1.60E+02
21	100,000 <= nCi/g < 200,000	4.60E+02	3.50E+02
Totals		1.79E+03	1.30E+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.

Alpha Activity Distribution

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INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-311

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	1.14E+03	3.38E-03	2.69E+05	1.42E+01	2.69E+05	4.37E-03	3.49E+05	1.83E+01	3.49E+05

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 -	Leaded Rubber	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	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	
<u>Combustibles</u> (>90% Combustible)			

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)			4-1
ABSORBENT (VERMICULITE)			4-1
OTHER (GRAPHITE SCARFINGS)			4-1

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INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-311

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

Inches

MANUFACTURED TO AIIM STANDARDS
BY APPLIED IMAGE, INC.

10 of 11

A. IDENTIFICATIONINEL ID/Name: **ID-EGG-137TN** NONMETAL MOLDS AND CRUCIBLES (TRU)C. Code/Name: **370** LECO CRUCIBLES**B. DESCRIPTION****INEL ID (WMIS) Description:**

Non hazardous TRU waste.

Total Volume (m3): 2.54

Gross Mass (kg): 1,920.00

Drum Equivalents: 12.00

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.

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INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-370

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	12	DRUM	2.54	1,920.00	LECO CRUCIBLES
Subtotal	12		2.54	1,920.00	

Total 12**2.54 m3****1,920.00 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)
1	100 <= nCi/g < 500	7.30E+02	6.60E+02
2	500 <= nCi/g < 1,000	2.80E+02	2.40E+02
12	10,000 <= nCi/g < 20,000	3.10E+02	2.40E+02
13	20,000 <= nCi/g < 30,000	2.10E+02	1.70E+02
16	50,000 <= nCi/g < 60,000	1.10E+02	8.70E+01
20	90,000 <= nCi/g < 100,000	7.50E+01	5.30E+01
Totals		1.72E+03	1.45E+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.

Alpha Activity Distribution

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)
AM-241	1.00E-01	9.11E-07	3.05E+03	5.47E-07	3.05E+03	1.15E-06	3.84E+03	6.89E-07	3.84E+03
PU-52	2.80E+02	2.25E-03	1.80E+05	9.46E+00	1.80E+05	3.04E-03	2.43E+05	1.28E+01	2.43E+05

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	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DRI)			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

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-370

A. IDENTIFICATION

INEL ID/Name: ID-EGG-137TN NONMETAL MOLDS AND CRUCIBLES (TRU)

C. Code/Name: 391

CRUCIBLES AND SAND

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

Non hazardous TRU waste.

Total Volume (m3): 4.66

Gross Mass (kg): 3,300.00

Drum Equivalents: 22.00

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 consists of broken magnesium oxide crucibles and limited amounts of magnesium oxide sand, used in a molten salt cleanup project when reducing plutonium tetrafluoride to plutonium metal. Above-discard levels of plutonium were recovered from these crucibles by nitric acid leaching.

The waste stream handling and packaging is as follows: the crucibles were placed into 1-gallon PE bottles. Each bottle was double-bagged out the glovebox in PVC and PE bags. Each bottle was assayed and the placed in prepared 55 gallon drums, about 12-16 bottles per drum. Some of the drums were lead-lined. Prior to 1972, the drums were lined with one or two PE bags, which were sealed with tape. Some of the drums may have cardboard liners inside of the inner liner. After 1972, 90-mil sealed rigid liners were used in addition to one or 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.

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-391

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	22	DRUM	4.66	3,300.00	CRUCIBLES AND SAND
Subtotal	22		4.66	3,300.00	

Total 22**4.66 m3****3,300.00 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 Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
4	2,000 <= nCi/g < 3,000	2.10E+02	1.90E+02
5	3,000 <= nCi/g < 4,000	1.20E+02	9.80E+01
8	6,000 <= nCi/g < 7,000	1.70E+02	1.40E+02
12	10,000 <= nCi/g < 20,000	1.00E+03	8.80E+02
13	20,000 <= nCi/g < 30,000	5.50E+02	4.80E+02
17	60,000 <= nCi/g < 70,000	2.60E+02	2.20E+02
18	70,000 <= nCi/g < 80,000	1.40E+02	1.10E+02
19	80,000 <= nCi/g < 90,000	1.10E+02	8.50E+01
21	100,000 <= nCi/g < 200,000	5.80E+02	4.70E+02
31	2,500,000 <= nCi/g < 5,000,000	9.60E+01	7.30E+01
Totals		3.24E+03	2.75E+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.

Alpha Activity Distribution

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)
AM-241	9.07E+01	8.01E-04	2.68E+06	4.81E-04	2.68E+06	1.04E-03	3.49E+06	6.26E-04	3.49E+06
PU-52	1.07E+03	3.73E-03	2.98E+05	1.57E+01	2.98E+05	4.63E-03	3.69E+05	1.94E+01	3.69E+05

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	8.0	
		Stainless Steel		
		Aluminum (AL)		
		Tantalum 10W		
		Miscellaneous Metal		
		Lead (Bulk Pb)		
		Other HVPM(Zn,Cd)	0.0	
	Misc. Non-Combustible -	Ceramic (molds)	84.0	
		Firebrick		
		Concrete		
		Portland Cement		
		Dirt/Soil		
		Ash		
		Oil-dri	1.0	
		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 -				
Misc. Combustibles -	Surgeons' Glove			
	Graphite (molds)			
	Paper			
	Wood			
	Cardboard			
		Cloth		

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
ABSORBENT (OIL-DR)			4-1
ABSORBENT (VERMICULITE)			4-1
OTHER (MAGNESIUM OXIDE CRUCIBLES AND SAND)			4-1
PLASTIC (PE BOTTLES)			4-1

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-391

A. IDENTIFICATION

INEL ID/Name: ID-EGG-137TN NONMETAL MOLDS AND CRUCIBLES (TRU)

C. Code/Name: 392 SAND, SLAG AND CRUCIBLES

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

Non hazardous TRU waste.

Total Volume (m3): 1.48

Gross Mass (kg): 1,300.00

Drum Equivalents: 7.00

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:**

Specific information is not available for this content code. The waste stream is thought to be similar to content code 391, crucibles and sand. The operation which generated the waste is unknown. The waste packaging and handling procedures are unknown, although the waste form is thought to be similar to content code 391. Due to lack of information regarding the waste stream, the waste cannot be certified (for WIPP) at present.

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-392

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
7	DRUM	1.48	1,300.00	SAND, SLAG AND CRUCIBLES
Subtotal 7		1.48	1,300.00	

Total 7**1.48 m3****1,300.00 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 Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
15	40,000 $\leq$ nCi/g $<$ 50,000	1.10E+02	8.90E+01
17	60,000 $\leq$ nCi/g $<$ 70,000	4.60E+02	3.70E+02
18	70,000 $\leq$ nCi/g $<$ 80,000	4.00E+02	3.00E+02
19	80,000 $\leq$ nCi/g $<$ 90,000	3.70E+02	2.80E+02
Totals		1.34E+03	1.04E+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.

Alpha Activity Distribution

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	1.23E+03	3.49E-03	2.79E+05	1.47E+01	2.79E+05	4.51E-03	3.59E+05	1.89E+01	3.59E+05

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)	8.0 0.0
	Misc. Non-Combustible -	Ceramic (molds) Firebrick Concrete Portland Cement Dirt/Soil Ash Oil-dri Vermiculite Salts	84.0 1.0
	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	
	Plastics -	Polyethylene Polyvinyl Chloride (PVC) Teflon Plexiglass	5.6 1.4 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.
OTHER (SAND, SLAG, AND CRUCIBLES)			4-1, 2

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INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-392

A. IDENTIFICATION

INEL ID/Name: ID-EGG-137TN NONMETAL MOLDS AND CRUCIBLES (TRU)

C. Code/Name: 393 SAND, SLAG, AND CRUCIBLE HEELS

B. DESCRIPTION

INEL ID (WMIS) Description:

Non hazardous TRU waste.

Total Volume (m3): 9.96

Gross Mass (kg): 4,400.00

Drum Equivalents: 47.00

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 consists of insoluble residue or "heel" generated from processing magnesium oxide sand and pulverized slag and magnesium oxide crucibles to remove above-discard amounts of plutonium. Respirable fines are thought to exceed the WIPP-WAC limits.

The waste stream handling and packaging is as follows: the dried heels were placed into 1/2 and 1-gallon PE bottles. Each bottle was double-bagged out the glovebox in PVC and PE bags. Each bottle was assayed and then placed in prepared 55-gallon drums, about 15-30 bottles per drum. Prior to 1972, the drums were lined with one or two PE bags, which were sealed with tape. Some of these drums may have cardboard liners inside the inner drum bag. After 1972, 90-mil sealed rigid liners were used in addition to one or 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.

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INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-393

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
47	DRUM	9.96	4,400.00	SAND, SLAG, AND CRUCIBLE HEELS
Subtotal	47	9.96	4,400.00	

Total 47**9.96 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.

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)
12	10,000 <= nCi/g < 20,000	1.00E+02	7.70E+01
16	50,000 <= nCi/g < 60,000	9.00E+01	6.70E+01
17	60,000 <= nCi/g < 70,000	2.60E+02	1.90E+02
18	70,000 <= nCi/g < 80,000	3.90E+02	3.00E+02
19	80,000 <= nCi/g < 90,000	2.00E+02	1.60E+02
20	90,000 <= nCi/g < 100,000	2.80E+02	2.10E+02
21	100,000 <= nCi/g < 200,000	3.00E+03	2.30E+03
22	200,000 <= nCi/g < 300,000	6.70E+01	4.40E+01
Totals		4.39E+03	3.35E+03

Alpha Activity Distribution

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.

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)
AM-241	3.65E-02	1.47E-07	4.92E+02	8.83E-08	4.92E+02	1.96E-07	6.56E+02	1.18E-07	6.56E+02
PU-52	7.00E+03	9.39E-03	7.49E+05	3.94E+01	7.49E+05	1.29E-02	1.03E+06	5.42E+01	1.03E+06

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)	
		Ceramic (molds)	84.0
		Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	1.0
		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	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	12.0
		Polyvinyl Chloride (PVC)	3.0
		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 (OIL-DRI)			4-1
ABSORBENT (VERMICULITE)			4-1
OTHER(INSOLUBLE RESIDUE-PROCESSING MG OXIDE)			4-1
PLASTIC (PE BOTTLES)			4-1

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-137TN-393

A. IDENTIFICATION

INEL ID/Name: ID-EGG-141TN PARTICULATE WASTES (TRU)

C. Code/Name: 420

VIRGIN INCINERATOR ASH

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

Non hazardous TRU waste.

Total Volume (m3): 2.33

Gross Mass (kg): 1,700.00

Drum Equivalents: 11.00

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 in the Pu recovery incinerator. Ash is packaged in 0.5- and 1-gallon PE bottles and then in standard RFP fashion in drums. Drums will hold up to 25 bottles depending on Pu content. Bottles are individually assayed and fissile quantities calculated.

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INEL Waste Profile Sheet

TRUW

ID-EGG-141TN-420

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
11	DRUM	2.33	1,700.00	VIRGIN INCINERATOR ASH
Subtotal	11	2.33	1,700.00	

Total 11**2.33 m3****1,700.00 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 Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
12	10,000 <= nCi/g < 20,000	9.40E+02	8.30E+02
13	20,000 <= nCi/g < 30,000	3.40E+02	3.00E+02
14	30,000 <= nCi/g < 40,000	1.70E+02	1.50E+02
21	100,000 <= nCi/g < 200,000	1.60E+02	1.20E+02
22	200,000 <= nCi/g < 300,000	7.40E+01	5.10E+01
Totals		1.68E+03	1.45E+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.

Alpha Activity Distribution

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INEL Waste Profile Sheet

TRUW

ID-EGG-141TN-420

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	7.81E+02	4.84E-03	3.86E+05	2.03E+01	3.86E+05	6.65E-03	5.30E+05	2.79E+01	5.30E+05

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	
		Asli	89.0
		Oil-dri	1.0
		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	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	6.4
		Polyvinyl Chloride (PVC)	1.6
		Tellon	0.0
<u>Combustibles</u> (>90% Combustible)	Plexiglass	Plexiglass	
	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
OTHER (ASH FROM PU RECOVERY INCINERATOR)			4-1
PLASTIC (PE BOTTLES)			4-1

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-141TN-420

A. IDENTIFICATION

INEL ID/Name: ID-EGG-141TN PARTICULATE WASTES (TRU)

C. Code/Name: 421 ASH HEELS

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

Non hazardous TRU waste.

Total Volume (m3): 21.41

Gross Mass (kg): 9,700.00

Drum Equivalents: 101.00

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 heels generated from the recovery of Pu from incinerator ash. Ash is packaged in 0.5-and 1-gallon PE bottles and then in standard RFP fashion in drums. Drums will hold up to 25 bottles depending on Pu content. Bottles are individually assayed and fissile quantities calculated.

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-141TN-421

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	101	DRUM	21.41	9,700.00	ASH HEELS
Subtotal	101		21.41	9,700.00	

Total	101	21.41 m3	9,700.00 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 Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
16	50,000 $\leq$ nCi/g < 60,000	1.20E+02	9.30E+01
18	70,000 $\leq$ nCi/g < 80,000	2.40E+02	1.90E+02
19	80,000 $\leq$ nCi/g < 90,000	6.70E+02	5.30E+02
20	90,000 $\leq$ nCi/g < 100,000	3.20E+02	2.50E+02
21	100,000 $\leq$ nCi/g < 200,000	8.40E+03	6.40E+03
Totals		9.75E+03	7.46E+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.

Alpha Activity Distribution

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	1.78E+04	5.94E-03	4.74E+05	2.49E+01	4.74E+05	7.57E-03	6.04E+05	3.18E+01	6.04E+05

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	89.0
		Oil-dri	1.0
		Vermiculite	2.0
		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	
<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	6.4
		Polyvinyl Chloride (PVC)	1.6
		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 (ASH HEELS FROM PU RECOVERY INCINERATOR)			4-1
PLASTIC (PE BOTTLES)			4-1

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-141TN-421

A. IDENTIFICATION

INEL ID/Name: ID-EGG-141TN PARTICULATE WASTES (TRU)

C. Code/Name: 422 SOOT

B. DESCRIPTION

INEL ID (WMIS) Description:

Non hazardous TRU waste.

Total Volume (m3): 5.09

Gross Mass (kg): 2,200.00

Drum Equivalents: 24.00

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 flyash generated from periodic cleaning of the Pu recovery incinerator off-gas system. Ash is packaged in 1- and 2-quart PE bottles and then in standard RFP fashion in drums. Drums will hold up to 50 bottles depending on Pu content. Bottles are individually assayed and fissile quantities calculated.

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INEL Waste Profile Sheet

TRUW

ID-EGG-141TN-422

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	24	DRUM	5.09	2,200.00	SOOT
Subtotal	24		5.09	2,200.00	

Total 24

5.09 m3

2,200.00 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 Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
2	500 <= nCi/g < 1,000	1.00E+02	7.70E+01
3	1,000 <= nCi/g < 2,000	6.40E+01	4.20E+01
5	3,000 <= nCi/g < 4,000	1.00E+02	7.70E+01
10	8,000 <= nCi/g < 9,000	1.90E+02	1.40E+02
11	9,000 <= nCi/g < 10,000	6.10E+01	3.90E+01
12	10,000 <= nCi/g < 20,000	6.10E+02	4.70E+02
13	20,000 <= nCi/g < 30,000	1.00E+02	5.80E+01
14	30,000 <= nCi/g < 40,000	1.70E+02	1.30E+02
15	40,000 <= nCi/g < 50,000	7.80E+01	5.50E+01
17	60,000 <= nCi/g < 70,000	1.90E+02	1.40E+02
18	70,000 <= nCi/g < 80,000	1.20E+02	9.70E+01
21	100,000 <= nCi/g < 200,000	3.00E+02	2.30E+02
22	200,000 <= nCi/g < 300,000	6.50E+01	4.30E+01
Totals		2.15E+03	1.60E+03

Alpha Activity Distribution

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.

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)
AM-241	9.30E-03	1.19E-07	3.99E+02	7.15E-08	3.99E+02	1.66E-07	5.63E+02	1.01E-07	5.63E+02
PU-52	1.27E+03	8.00E-03	6.38E+05	3.35E+01	6.38E+05	1.12E-02	8.94E+05	4.70E+01	8.94E+05

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	89.0
		Oil-dri	1.0
		Vermiculite	2.0
		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)	
		Aqueous Solutions	
	Partially Combustible -	Leaded Rubber	
		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	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

Component	Conc.	Units of Conc.	Ref.
OTHER (FLY ASH FROM PU RECOVERY INCINERATOR)			4-1
PLASTIC (PE BOTTLES)			4-1

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INEL Waste Profile Sheet

TRUW

ID-EGG-141TN-422

A. IDENTIFICATION

INEL ID/Name: ID-EGG-141TN PARTICULATE WASTES (TRU)

C. Code/Name: 425 FLUID BED ASH

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

Non hazardous TRU waste.

Total Volume (m3): .42

Gross Mass (kg): 350.00

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 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.

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INEL Waste Profile Sheet

TRUW

ID-EGG-141TN-425

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	2	DRUM	0.42	350.00	FLUID BED ASH
Subtotal	2		0.42	350.00	

Total	2	.42 m3	350.00 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 Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
1	100 <= nCi/g < 500	1.70E+02	1.40E+02
2	500 <= nCi/g < 1,000	1.60E+02	1.40E+02
Totals		3.30E+02	2.80E+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.

Alpha Activity Distribution

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INEL Waste Profile Sheet

TRUW

ID-EGG-141TN-425

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	3.00E+00	1.84E-05	1.47E+03	7.72E-02	1.47E+03	2.14E-05	1.70E+03	8.96E-02	1.70E+03

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	89.0
		Oil-dri	1.0
		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	
		Organic Sludge	
		Uncemented Resin	
		Cemented Resin	
		Asphalt	
		Benelex/lead	
		Sheetrock	
	Plastics -	Polyethylene	6.4
		Polyvinyl Chloride (PVC)	1.6
		Teflon	0.0
<u>Combustibles</u> (>90% Combustible)		Plexiglass	
	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

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-141TN-425

A. IDENTIFICATION

INEL ID/Name: ID-EGG-144TN RADIOACTIVE SOURCES (TRU)

C. Code/Name: 15 NEUTRON SOURCES

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

Non hazardous TRU waste.

Content Code Description:

There is no content information on this codes, which was generated at Bettis Atomic Power Laboratory.

Total Volume (m3): .64

Gross Mass (kg): 4.00

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

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INEL Waste Profile Sheet

TRUW

ID-EGG-144TN-15

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
3	DRUM	0.64	4.00	NEUTRON SOURCES
Subtotal 3		0.64	4.00	

Total 3	.64 m3	4.00 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 Radionuclide and Alpha Activity Concentration Information**ALPHA ACTIVITY CONCENTRATION PROFILE**

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
34	10,000,000 <= nCi/g	3.60E+00	0.00E+00
Totals		3.60E+00	0.00E+00

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

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-144TN-15

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-238	4.70E+00	1.31E-03	1.99E+07	9.58E+02	1.99E+07	0.00E+00	0.00E+00	0.00E+00	0.00E+00

E. 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.

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-144TN-15

A. IDENTIFICATION

INEL ID/Name: ID-EGG-144TN RADIOACTIVE SOURCES (TRU)

C. Code/Name: 152

PU NEUTRON SOURCES

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

Non hazardous TRU waste.

Total Volume (m3): 5.41

Gross Mass (kg): 2,470.00

Drum Equivalents: 25.51

Physical Form: SOLID

Physical Type: CONTAMINATED EQUIPMENT, PAPER, PLASTIC, RAGS,
METALPCBs: ☐

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 Argonne National Laboratory-West at the INEL. These wastes consist of noncombustible materials including Pu-Be neutron sources (small fuel samples, small sections of moderator, a pu standard, and pu foil), tools, hot cell operating equipment, various containers, and ferrous and nonferrous metals. Some combustible materials may include paper, plastic and PVC containers, rags, Q-tips, string mop heads, and an electrical plug strip and cord.

This waste is WIPP certifiable, but it may not be TRAMPAC 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. Some individual items may be unbagged.

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INEL Waste Profile Sheet

TRUW

ID-EGG-144TN-152

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	BIN	3.50	1,600.00	PU NEUTRON SOURCES
1	INSERT	0.21	200.00	PU NEUTRON SOURCES
8	DRUM	1.70	670.00	PU NEUTRON SOURCES
Subtotal	10	5.41	2,470.00	

Total 10**5.41 m3****2,470.00 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)
1	100 $\leq$ nCi/g $<$ 500	4.50E+01	2.30E+01
3	1,000 $\leq$ nCi/g $<$ 2,000	2.00E+02	2.00E+02
16	50,000 $\leq$ nCi/g $<$ 60,000	5.00E+01	2.70E+01
21	100,000 $\leq$ nCi/g $<$ 200,000	5.00E+01	2.70E+01
22	200,000 $\leq$ nCi/g $<$ 300,000	3.40E+02	2.70E+02
25	500,000 $\leq$ nCi/g $<$ 600,000	6.80E+01	4.50E+01
30	1,000,000 $\leq$ nCi/g $<$ 2,500,000	1.70E+03	1.40E+03
Totals		2.45E+03	1.99E+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.

Alpha Activity Distribution

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	2.66E+02	3.62E-03	2.25E+05	3.00E-03	2.25E+05	5.69E-03	3.53E+05	4.71E-03	3.53E+05
PU-238	2.12E+02	1.38E-04	2.09E+06	1.01E+02	2.09E+06	1.71E-04	2.59E+06	1.25E+02	2.59E+06
PU-240	1.40E+02	2.22E-03	5.03E+05	2.28E-01	5.03E+05	3.53E-03	7.99E+05	3.63E-01	7.99E+05

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	10.0	
	Metals -	Carbon Steel		
		Stainless Steel	20.0	
		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	30.0	
		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		
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	16.0	
		Polyvinyl Chloride (PVC)	4.0	
		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.
METAL (FERROUS AND NONFERROUS, TOOLS)			4-1, 2
ORGANICS	14	LB/FT3	4-1
OTHER (ELECTRICAL PLUGS, STRIP, CORD)			4-1
OTHER (PU AND NEUTRON SOURCES, EQUIPMENT)			4-1, 2
PAPER			4-1, 2
PLASTIC (PVC)			4-1, 2
RAGS			4-1, 2

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-144TN-152

A. IDENTIFICATION

INEL ID/Name: ID-EGG-146TN SALTS (TRU)

C. Code/Name: 410 MOLTEN SALTS - 30% PULVERIZED

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

Non hazardous TRU waste.

Total Volume (m3): 4.66

Gross Mass (kg): 3,000.00

Drum Equivalents: 22.00

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 a fused halide salt mixture of NaCl, KCl, and MgCl₂, used to pyrochemically remove americium from plutonium metal. The waste was generated from cleanup of spent salts. The waste is certifiable for shipment to WIPP. Some of the containers are lead lined.

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-146TN-410

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	22	DRUM	4.66	3,000.00	MOLTEN SALTS - 30% PULVERIZED
Subtotal	22		4.66	3,000.00	

Total 22**4.66 m3****3,000.00 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 Radionuclide and Alpha Activity Concentration Information

ALPHA ACTIVITY CONCENTRATION PROFILE

Interval Number	TRU Alpha Activity Concentration	Interval Gross Mass (kg)	Interval Waste Mass (kg)
2	500 <= nCi/g < 1,000	1.10E+02	9.10E+01
6	4,000 <= nCi/g < 5,000	1.20E+02	9.50E+01
10	8,000 <= nCi/g < 9,000	1.30E+02	1.00E+02
11	9,000 <= nCi/g < 10,000	1.60E+02	1.40E+02
12	10,000 <= nCi/g < 20,000	1.00E+03	8.70E+02
13	20,000 <= nCi/g < 30,000	2.50E+02	2.00E+02
14	30,000 <= nCi/g < 40,000	4.70E+02	4.00E+02
15	40,000 <= nCi/g < 50,000	1.70E+02	1.50E+02
17	60,000 <= nCi/g < 70,000	3.00E+02	2.60E+02
18	70,000 <= nCi/g < 80,000	1.70E+02	1.50E+02
20	90,000 <= nCi/g < 100,000	8.30E+01	6.00E+01

Totals

2.96E+03

2.52E+03

Alpha Activity Distribution

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.

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)
AM-241	2.06E+01	8.61E-05	2.88E+05	5.16E-05	2.88E+05	1.05E-04	3.53E+05	6.33E-05	3.53E+05
PU-52	2.33E+02	1.05E-03	8.40E+04	4.42E+00	8.40E+04	1.29E-03	1.03E+05	5.39E+00	1.03E+05

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	9.7	
		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	2.0	
		Vermiculite	3.7	
		Salts	69.3	
		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		
		Benelex/lead		
		Sheetrock		
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	12.2	
		Polyvinyl Chloride (PVC)	3.0	
		Tellon	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 (FUSED HALIDE SALT MIXTURE NaCl, KCl & MgCl ₂)			4-1

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-146TN-410

A. IDENTIFICATION

INEL ID/Name: ID-EGG-146TN SALTS (TRU)

C. Code/Name: 411

ELECTROREFINING SALT

B. DESCRIPTION

INEL ID (WMIS) Description:

Non hazardous TRU waste.

Total Volume (m3): 1.27

Gross Mass (kg): 530.00

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 fused halide salt mixtures of CaCl₂, NaCl, KCl and MgCl₂ from electrorefining processes. The waste was generated from cleanup of spent salts. The waste is certifiable for shipment to WIPP.

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-146TN-411

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
6	DRUM	1.27	530.00	ELECTROREFINING SALT
Subtotal 6		1.27	530.00	

Total 6**1.27 m3****530.00 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)
3	1,000 $\leq$ nCi/g $<$ 2,000	6.60E+01	4.30E+01
12	10,000 $\leq$ nCi/g $<$ 20,000	1.50E+02	1.30E+02
14	30,000 $\leq$ nCi/g $<$ 40,000	1.40E+02	1.10E+02
22	200,000 $\leq$ nCi/g $<$ 300,000	1.80E+02	1.10E+02
Totals		5.36E+02	3.93E+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

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	6.36E+02	3.78E-03	3.01E+05	1.58E+01	3.01E+05	5.89E-03	4.70E+05	2.47E+01	4.70E+05

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	9.7
		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	3.7
		Salts	69.3
	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	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	12.2
		Polyvinyl Chloride (PVC)	3.0
		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(FUSED HALIDE SALT MIX.CACL ₂ . NACL,KCL,CACL ₂)			4-1

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-146TN-411

A. IDENTIFICATION

INEL ID/Name: ID-EGG-146TN SALTS (TRU)

C. Code/Name: 412 GIBSON SALTS

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

Non hazardous TRU waste.

Total Volume (m3): .21

Gross Mass (kg): 110.00

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, generated at Rocky Flats Plant, consists of a halide salt mixture of CaCl₂ and KCl used in an experimental pyroreox research and development project. The waste is certifiable for shipment to WIPP.

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-146TN-412

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	DRUM	0.21	110.00	GIBSON SALTS
Subtotal	1	0.21	110.00	

Total 1**.21 m3****110.00 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)
12	10,000 <= nCi/g < 20,000	1.10E+02	9.10E+01
Totals		1.10E+02	9.10E+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.

Alpha Activity Distribution

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	2.10E+01	1.85E-04	1.48E+04	7.77E-01	1.48E+04	2.32E-04	1.85E+04	9.71E-01	1.85E+04

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	9.7
		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	3.7
		Salts	69.3
	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	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> (>90% Combustible)	Plastics -	Polyethylene	12.2
		Polyvinyl Chloride (PVC)	3.0
		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 (HALIDE SALT MIX. CaCl2 AND KCL)			4-1

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-146TN-412

A. IDENTIFICATION

INEL ID/Name: ID-EGG-158TN UNCEMENTED ORGANIC SLUDGE (TRU)

C. Code/Name: 50 SOLIDIFIED SOLUTIONS

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

Non hazardous TRU waste.

Total Volume (m3): .21

Gross Mass (kg): 99.00

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 is from Bettis Atomic Power Laboratory. It consists of a single drum of TRU. No more information is available.

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-158TN-50

C. STORAGE

# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
1	DRUM	0.21	99.00	SOLIDIFIED SOLUTIONS
Subtotal	1	0.21	99.00	

Total 1**.21 m3****99.00 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)
1	100 <= nC/g < 500	9.90E+01	6.90E+01
Totals		9.90E+01	6.90E+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.

Alpha Activity Distribution

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)
NP-237	1.00E-01	1.01E-06	7.12E-01	3.05E-05	7.12E-01	1.46E-06	1.03E+00	4.40E-05	1.03E+00
PU-239	4.10E-01	4.14E-06	2.57E+02	3.43E-06	2.57E+02	5.98E-06	3.71E+02	4.95E-06	3.71E+02

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	94.0
		Portland Cement	3.8
		Dirt/Soil	
		Ash	
		Oil-dri	1.1
		Vermiculite	0.2
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
<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	
		Benelux/lead	
		Sheetrock	
		Plastics - Polyethylene	0.7
		Polyvinyl Chloride (PVC)	0.2
		Teflon	0.0
		Plexiglass	
<u>Combustibles</u> (>90% Combustible)	Rubber -	Rubber	
		Surgeons' Glove	
	Misc. Combustibles -	Graphite (molds)	
		Paper	
		Wood	
		Cardboard	
		Cloth	

PHYSICAL/CHEMICAL COMPOSITION

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

23-Mar-94

INEL Waste Profile Sheet

TRUW

ID-EGG-158TN-50

**6. PROFILE SHEETS CATEGORIZED AS ALPHA LOW-LEVEL
THAT MAY BE TRANSURANIC**

6. PROFILE SHEETS CATEGORIZED AS ALPHA LOW-LEVEL THAT MAY BE TRANSURANIC

Previous INEL reports have identified the profile sheets tabulated in this section as ALLMW or ALLW. The precise rationale used for the initial categorization of the indicated profile sheets as alpha low-level is not known. Based upon the interpretation of the current DOE 5820.2A definition of transuranic waste, these particular profile sheets should be considered TRUMW or TRUW for the purpose of waste treatment feasibility studies and related activities. A basis for the TRUW/TRUMW classification of each of the profile sheets is provided in the respective Content Code Description in Section B.

A. IDENTIFICATION

INEL ID/Name: ID-EGG-102

UNCEMENTED INORGANIC SLUDGE (a-LLW)

C. Code/Name: 290

FILTER SLUDGE

B. DESCRIPTION

INEL ID (WMIS) Description:

Miscellaneous inorganic setups.

Total Volume (m3): .21

Gross Mass (kg): 127.00

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 stream, generated at Rocky Flats Plant, consists of only one (1) drum of wet sludge from the incinerator off-gas system, recovery building filter plenums, pumps, etc. Content Code 290 was replaced with Code 292 in 1974.

This waste is uncertifiable (for WIPP) due to the presence of free liquids. Organic content is less than 14 lb/ft³, and gas generation should be minimal. No explosive, pyrophoric, or corrosive materials should be in the waste.

The filter sludge was packaged in 1-quart ice cream cartons. Each carton was sealed. It is believed that each carton was bagged and sealed in a Vollrath 8802 stainless steel can. Cans were assayed and then placed in groups of 20 - 25 in prepared 55-gallon drums.

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

ID-EGG-102-290 is currently classified as ALLMW by the Idaho Mixed Waste Information database. The alpha activity concentration for the mass of Pu-239 reported for this wastestream exceeds 100 nCi/g. Therefore, in accordance with DOE Order 5820.2A, this wastestream may be considered TRUMW and should be considered as such for the INEL waste treatment feasibility studies.

23-Mar-94

INEL Waste Profile Sheet

TRUMW

ID-EGG-102-290

C. STORAGE

	# of Cont.	Container Type	Total Vol. (m3)	Gross Mass (kg)	Waste Description
	1	DRUM	0.21	127.00	FILTER SLUDGE
Subtotal	1		0.21	127.00	

Total 1**.21 m3****127.00 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)
12	10,000 <= nCvg < 20,000	6.60E+01	4.30E+01
Totals		6.60E+01	4.30E+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.

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-52	1.40E+01	2.13E-04	1.70E+04	8.93E-01	1.70E+04	3.25E-04	2.59E+04	1.36E+00	2.59E+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	
		Stainless Steel	
		Aluminum (AL)	
		Tantalum 10W	
		Miscellaneous Metal	0.0
		Lead (Bulk Pb)	
		Other HVPM (Zn, Cd)	0.0
		Ceramic (molds)	
	Misc. Non-Combustible -	Firebrick	
		Concrete	
		Portland Cement	
		Dirt/Soil	
		Ash	
		Oil-dri	1.5
		Vermiculite	1.7
		Salts	
	Filters/Insulation -	Glass Filter Media	
		Asbestos (filter, insulation)	
		Filter Dust	
		Magnesia (insulations)	
	Inorganic Sludge -	Sludge High Na ₂ O (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	
		Benelex/lead	
		Sheetrock	
<u>Combustibles</u> ($> 90\%$ Combustible)	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.
ORGANICS	14	LB/FT ³	4-1
SLUDGE			4-1, 2

7. INDEX BY CONTENT CODE

Table 7-1 provides a cross-reference to the INEL Waste Profile Sheet corresponding to a particular content code. If used in conjunction with the Table of Contents for Sections 4 and 5 of this document, this table should assist in location of information in the report.

Table 7-1. Cross-reference of TRU content code numbers and INEL profile sheets page numbers.

Content code number	Content code name	INEL ID number	Waste type	INEL profile sheet page number
* —		CH-ANL-177T	TRUMW	4-3
* —		CH-ANL-180T	TRUMW	4-9
* —		CH-ANL-182T	TRUMW	4-15
* —		CH-ANL-241T	TRUMW	4-21
* —		CH-ANL-243T	TRUMW	4-27
* —		CH-ANL-245T	TRUMW	4-33
* —		CH-ANL-246T	TRUMW	4-39
* —		ID-EGG-142T	TRUMW	4-503
* —		ID-EGG-291T	TRUMW	4-697
0	Not recorded-unknown	ID-EGG-287T	TRUMW	4-581
1	First-stage sludge	ID-EGG-102T	TRUMW	4-045
2	Second-stage sludge	ID-EGG-102T	TRUMW	4-053
3	Organic setups, oil solids	ID-EGG-158T	TRUMW	4-575
4	Special setups (cement)	ID-EGG-112T	TRUMW	4-115
5	Evaporator salts	ID-EGG-146T	TRUMW	4-551
7	Building 374 dry sludge	ID-EGG-102T	TRUMW	4-061
10	Combustibles	ID-EGG-114T	TRUMW	4-169
15	Neutron sources	ID-EGG-144TN	TRUW	5-111
20	Noncompressible, noncombustible	ID-EGG-132T	TRUMW	4-373
30	Solidified grinding sludge, etc.	ID-EGG-102T	TRUMW	4-067
50	Solidified solutions	ID-EGG-158TN	TRUW	5-141
100	General plant waste	ID-EGG-134T	TRUMW	4-409
101	Cut-up gloveboxes	ID-EGG-134T	TRUMW	4-415
102	Absorbed liquids	ID-EGG-288T	TRUMW	4-595
104	Alpha hot cell waste	ID-EGG-144T	TRUMW	4-509

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.

11 of 11

Table 7-1. (continued).

Content code number	Content code name	INEL ID number	Waste type	INEL profile sheet page number
105	Empty bottles	ID-EGG-288T	TRUMW	4-601
106	Special source material	ID-EGG-288T	TRUMW	4-607
107	Uncertified TRU—RH waste	ID-EGG-288T	TRUMW	4-613
110	Research-generated waste compact	ID-EGG-144T	TRUMW	4-175
111	WIPP precertified, RGW noncompactible solids or certified solids wet sludge	ID-EGG-102T	TRUMW	4-073
112	Certified solid organics	ID-EGG-112T	TRUMW	4-121
113	Certified solid lab waste	ID-EGG-102T	TRUMW	4-079
114	Certified solid inorganic process solution	ID-EGG-112T	TRUMW	4-127
115	Certified TRU graphite waste	ID-EGG-137TN	TRUW	5-039
116	Certified TRU combustible waste	ID-EGG-114T	TRUMW	4-181
117	Certified TRU metal waste	ID-EGG-132T	TRUMW	4-379
118	Certified TRU glass waste	ID-EGG-119T	TRUMW	4-319
119	Certified TRU HEPA filter waste	ID-EGG-118T	TRUMW	4-263
120	DDW combustible solids	ID-EGG-114T	TRUMW	4-187
121	WIPP precertified DDW noncombustible solids	ID-EGG-134T	TRUMW	4-421
122	Certified TRU inorganic solid waste	ID-EGG-115T	TRUMW	4-245
123	Certified TRU leaded rubber	ID-EGG-120T	TRUMW	4-349
124	Certified TRU pyrochemical salt waste	ID-EGG-146T	TRUMW	4-557
150	Laboratory waste	ID-EGG-141T	TRUMW	4-477
151	Solidified fuel sludge	ID-EGG-144T	TRUMW	4-515
152	Pu neutron sources	ID-EGG-144TN	TRUW	5-117
153	Combustible lab waste	ID-EGG-144T	TRUMW	4-509
154	Sample fuel	ID-EGG-144T	TRUMW	4-527
155	TRU scrap	ID-EGG-288T	TRUMW	4-619
157	Miscellaneous sources	ID-EGG-288T	TRUMW	4-625
160	ANL-W HFEF analytical chemistry and metallographic combustibles	ID-EGG-188T	TRUMW	4-631
162	ANL-W FMF EFL ZR-U fuel casting alloys residues	ID-EGG-188T	TRUMW	4-637
163	ANL-W ACL cold-line absorbed liquid	ID-EGG-188T	TRUMW	4-643
200	Americium sources	ID-EGG-188T	TRUMW	4-649
201	Noncombustible solids	ID-EGG-134T	TRUMW	4-427

Table 7-1. (continued).

Content code number	Content code name	INEL ID number	Waste type	INEL profile sheet page number
202	Combustible solids	ID-EGG-188T	TRUMW	4-655
203	Paper, metals, glass	ID-EGG-188T	TRUMW	4-661
204	Solidified solutions	ID-EGG-188T	TRUMW	4-667
241	Americium process residue	ID-EGG-137T	TRUMW	4-433
290	Filter sludge	ID-EGG-102	TRUMW	6-5
292	Cemented sludge	ID-EGG-102T	TRUMW	4-085
300	Graphite	ID-EGG-137T	TRUMW	4-453
301	Graphite cores	ID-EGG-137T	TRUMW	4-459
302	Benelex and Plexiglas ^a	ID-EGG-109T	TRUMW	4-103
303	Scarfed graphite chunks	ID-EGG-137TN	TRUW	5-045
310	Graphite scarrings	ID-EGG-137TN	TRUW	5-051
311	Graphite heels	ID-EGG-137TN	TRUW	5-057
312	Coarse graphite	ID-EGG-137T	TRUMW	4-465
320	Tantalum	ID-EGG-132T	TRUMW	4-385
328	Fulflo incinerator filters	ID-EGG-118T	TRUMW	4-269
330	Dry paper and rags	ID-EGG-114T	TRUMW	4-193
335	Absolute 8 x 8 filters	ID-EGG-118T	TRUMW	4-275
336	Moist paper and rags	ID-EGG-114T	TRUMW	4-199
337	Plastics, Teflon, wash, PVC	ID-EGG-114T	TRUMW	4-207
338	Insulation and CWS filter media	ID-EGG-118T	TRUMW	4-281
339	Leaded rubber gloves and aprons ^b	ID-EGG-120T	TRUMW	4-355
360	Insulation	ID-EGG-118T	TRUMW	4-287
361	Insulation heels	ID-EGG-118TN	TRUW	5-021
370	Crucible, LECO	ID-EGG-137TN	TRUW	5-063
371	Firebrick	ID-EGG-115T	TRUMW	4-251
372	Grit	ID-EGG-141T	TRUMW	4-485
374	Blacktop, concrete, dirt and sand	ID-EGG-141T	TRUMW	4-491
375	Oil-Dri residue from incinerator	ID-EGG-115T	TRUMW	4-257
376	Cemented insulation/filter media	ID-EGG-118T	TRUMW	4-293
391	Crucibles and sand	ID-EGG-137TN	TRUW	5-069

Table 7-1. (continued).

Content code number	Content code name	INEL ID number	Waste type	INEL profile sheet page number
392	Sand, slag and crucibles	ID-EGG-137TN	TRUW	5-075
393	Sand, slag, and crucible heels	ID-EGG-137TN	TRUW	5-081
409	Molten salts—30% unpulverized	ID-EGG-146T	TRUMW	4-563
410	Molten salts—30% pulverized	ID-EGG-146TN	TRUW	5-123
411	Electrorefining salt	ID-EGG-146TN	TRUW	5-129
412	Gibson salts	ID-EGG-146TN	TRUW	5-135
414	Direct oxide reduction salt	ID-EGG-146T	TRUMW	4-569
416	Zinc magnesium alloy metal	ID-EGG-132TN	TRUW	5-027
420	Virgin incinerator ash	ID-EGG-141TN	TRUW	5-087
421	Ash heels	ID-EGG-141TN	TRUW	5-093
422	Soot	ID-EGG-141TN	TRUW	5-099
425	Fluid bed ash	ID-EGG-141TN	TRUW	5-105
430	Unleached iron column resin	ID-EGG-145T	TRUMW	4-533
431	Leached resin	ID-EGG-145T	TRUMW	4-539
432	Leached and cemented resin	ID-EGG-145T	TRUMW	4-545
440	Glass	ID-EGG-119T	TRUMW	4-325
441	Unleached Raschig rings	ID-EGG-119T	TRUMW	4-331
442	Leached Raschig rings	ID-EGG-119T	TRUMW	4-337
460	Washables, rubber, plastics	ID-EGG-114T	TRUMW	4-215
463	Leaded rubber gloves and aprons ^b	ID-EGG-120T	TRUMW	4-361
464	Benelex and Plexiglas ^a	ID-EGG-109T	TRUMW	4-109
480	Nonspecial source metal	ID-EGG-132T	TRUMW	4-391
481	Leached nonspecial source metal	ID-EGG-132T	TRUMW	4-397
490	CWS filters	ID-EGG-118T	TRUMW	4-301
700	Organic and sludge immobilization	ID-EGG-112T	TRUMW	4-133
801	Plastic, Tygon, manipulator boots	ID-EGG-288T	TRUMW	4-673
802	Dry box gloves and o-rings	ID-EGG-120T	TRUMW	4-367
803	Metal, equipment, pipes, valves, etc.	ID-EGG-132T	TRUMW	4-403
804	Plastic, Tygon, manipulator boots	ID-EGG-114TN	TRUW	5-009
805	Asbestos filters	ID-EGG-118T	TRUMW	4-307

Table 7-1. (continued).

Content code number	Content code name	INEL ID number	Waste type	INEL profile sheet page number
810	Glass, flasks, sample vials, etc.	ID-EGG-119T	TRUMW	4-343
811	Evaporator and dissolver sludge	ID-EGG-102T	TRUMW	4-091
813	Glass filters and fiberglass	ID-EGG-118T	TRUMW	4-313
814	Contaminated mercury or graphite	ID-EGG-137T	TRUMW	4-471
815	Classified parts	ID-EGG-288T	TRUMW	4-679
824	Noncombustible equipment boxes	ID-EGG-134T	TRUMW	4-439
825	Noncombustible equipment drums	ID-EGG-134TN	TRUW	5-033
826	Combustible equipment boxes or floor sweepings and rust	ID-EGG-114T	TRUMW	4-221
827	Combustible equipment drums	ID-EGG-114TN	TRUMW	4-227
834	High-level acid	ID-EGG-112T	TRUMW	4-139
835	High-level caustic	ID-EGG-112T	TRUMW	4-145
836	High-level sludge/cement	ID-EGG-112T	TRUMW	4-151
842	Contaminated soil	ID-EGG-141T	TRUMW	4-497
847	LSA <100 nCi/g combustible	ID-EGG-288T	TRUMW	4-685
848	LSA <100 nCi/g noncombustible	ID-EGG-288T	TRUMW	4-691
900	LSA plastics, paper, etc.	ID-EGG-114T	TRUMW	4-233
950	LSA metal, glass, etc.	ID-EGG-134T	TRUMW	4-447
960	Concrete, asphalt, etc.	ID-EGG-115TN	TRUW	5-015
970	Wood	ID-EGG-114T	TRUMW	4-239
976	Building 776 process sludge	ID-EGG-112T	TRUMW	4-157
978	Laundry sludge	ID-EGG-112T	TRUMW	4-163
980	Equipment	ID-EGG-102T	TRUMW	4-097
995	Sludge ^c	ID-EGG-102TN	TRUW	5-003
9999	Pre-73 drums	ID-EGG-287T	TRUMW	4-589

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

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

c. 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. (Note: Content Code 95 is not a TRUMW or TRUW content code.)

8. REFERENCES

Section 1

- 1-1. Apel, M. L., G. K. Becker, Z. K. Ragan, J. Frasure, B. D. Raivo, L. G. Gale, and D. P. Pace, *Radiological, Physical and Chemical Characterization of Low-Level Alpha Contaminated Wastes Stored at the Idaho National Engineering Laboratory*, Idaho National Engineering Laboratory, EG&G Idaho, Inc., EGG-RWMC-11189, March 1994.
- 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.

Section 2

- 2-1. 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.
- 2-2. 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.
- 2-3. Browne E. and R. B. Firestone, *Table of Radioactive Isotopes*, John Wiley & Sons, 1986.
- 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.
- 2-6. Anderson M. E. and J. F. Lemming, *Selected Measurement Data for Plutonium and Uranium*, Mound Laboratory report MLM-3009/ISPO-157, November 1982.
- 2-7. 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.
- 2-8. East, L. V., *SWEPP Passive-Active Neutron Assay Database Description*, EG&G Idaho RWMC-EDF-688. December 1993.
- 2-9. Becker, G. K., *Pink Drum Calibration and Verification Calculations for FTC-CF-Z284 Californium Source*, RWMC-EDF-547, May 1992.

Section 3

- 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.

Section 4

- 4-1. IMWI Reference No. 1. W. S. Roesener et al., Identification of a Treatment Process for the Idaho Waste Processing Facility Project—A Preconceptual Design Study. WM-PD-92-009, September 1992.
- 4-2. IMWI Reference No. 2. K. P. Guay, T. L. Clements, Jr., EPA Hazardous Waste Codes Found in INEL Stored TRU Waste Content Codes, EDF-RWMC-421 Revision 1, February 23, 1991.
- 4-3. IMWI Reference No. 3. U.S. DOE, Federal Facilities Compliance Act 180 Day Report, Appendix 13, Waste Profile Data Sheets, April 1993.
- 4-4. IMWI Reference No. 4. Waste Management Information System, Oak Ridge National Laboratory, Input Data Sheets from Argonne National Laboratory-West, December 11, 1992.

- 4-5. IMWI Reference No. 5. Waste Management Information System, Oak Ridge National Laboratory, Input Data Sheets from Samuel Pole, December 9, 1992.
- 4-6. IMWI Reference No. 6. Waste Management Information System, Oak Ridge National Laboratory, Input Data Sheets from EG&G Idaho, handwritten markups, December 1992.
- 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.
- 4-8. IMWI Reference No. 8. Waste Management Information System, Oak Ridge National Laboratory, Input Data Sheets from Babcock and Wilcox, handwritten markups, December 1992, March 1993.
- 4-9. IMWI Reference No. 9. Waste Management Information System, Oak Ridge National Laboratory, Input Data Sheets from WINCO, handwritten markups, February 1993.
- 4-10. IMWI Reference No. 10. Listed Waste Determination Report (Draft), WINCO, December 1992.
- 4-11. IMWI Reference No. 11. EG&G Form 669, Generator's Hazardous Waste Material Profile Sheet, EG&G Idaho.
- 4-12. IMWI Reference No. 12. EG&G Form 669, Generator's Hazardous Waste Material Profile Sheet, EG&G Idaho, Rev. September 1985.
- 4-13. IMWI Reference No. 13. EG&G Form 669, Generator's Hazardous Waste Material Profile Sheet, EG&G Idaho, Rev. June 1987.
- 4-14. IMWI Reference No. 14. EG&G Form 669, Generator's Hazardous Waste Material Profile Sheet, EG&G Idaho, March 1991.
- 4-15. IMWI Reference No. 15. EG&G Form 669A, Hazardous Radioactive Mixed Waste Packaging Requirements, EG&G Idaho, September 1985.
- 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.
- 4-18. IMWI Reference No. 18. EG&G Form 112B, Radioactive Shipment Truck Survey Sheet, EG&G Idaho, February 1977.
- 4-19. IMWI Reference No. 19. D. R. Tyson, Treatment Study of Scintillation Cocktails Generated from TRA (WERF Code ID #55-91), WROC-EDF-113, February 17, 1992.

- 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.
- 4-21. IMWI Reference No. 21. D. R. Tyson, Treatment Study of Freon Decontamination Waste Generated from TRA (WERF Code ID #56-91), WROC-EDF-106, January 30, 1992.
- 4-22. IMWI Reference No. 22. D. R. Tyson, Treatment Study of Mercury Contaminated Debris and Asbestos Waste Generated from WERF (WERF Code ID #66-91) (Draft) WROC-EDF-121.
- 4-23. IMWI Reference No. 23. D. R. Tyson, Treatment Study of Uranium Spiked Lead Waste Generated from WERF (WERF Code ID #65-911) (Draft).
- 4-24. IMWI Reference No. 24. D. R. Tyson, Treatment Study of Liquid Freon Waste Generated from TRA (WERF Code ID #72-91), WROC-EDF-108, January 30, 1992.
- 4-25. IMWI Reference No. 25. D. R. Tyson, Treatment Study of Grease/Carburetor Cleaner Generated from RWMC (WERF Code ID #77-91), WROC-EDF-109, January 28, 1992.
- 4-26. IMWI Reference No. 26. D. R. Tyson, Treatment Study of Diatomaceous Earth with Grease and Cleaner Waste from RWMC (WERF Code ID #78-91) (Draft).
- 4-27. IMWI Reference No. 27. D. R. Tyson, LDR MW Characterization and Categorization EDF, EDF-058, January 2, 1991.
- 4-28. IMWI Reference No. 28. D. R. Tyson, Treatment Study of Clean-up Water Containing Trichloroethylene from TAN (WERF Code ID #51-91), WROC-EDF-104, January 16, 1992.
- 4-29. IMWI Reference No. 29. E. C. Garcia, Planning Report for Treatment of LDR Mixed Wastes, EDF-062 (Draft).
- 4-30. IMWI Reference No. 30. DOE Form ID F.5480.1B, U.S. DOE On-Site Radioactive Material Shipment Record, DOE, May 1983.
- 4-31. IMWI Reference No. 31. DOE Form ID F 5480.1A, U.S. DOE Off-Site Radioactive Material Shipment Record, DOE, July 1983.
- 4-32. IMWI Reference No. 32. DOE Form ID F 5480.3A, U.S. DOE Hazardous Material Shipping Record, DOE, March 1991.
- 4-33. IMWI Reference No. 33. DOE Form ID F 5820.2, Stored, Disposed, or Processed Solid Radioactive Waste Form, DOE, November 1985.
- 4-34. IMWI Reference No. 34. DOE Form ID F 5820.2, Stored, Disposed, or Processed Solid Radioactive Waste Form, DOE, February 2, 1987.

- 4-35. IMWI Reference No. 35. Labelmaster Form F15REV-6 (Form approved. OMB No. 2050-0039), Uniform Hazardous Waste Manifest.
- 4-36. IMWI Reference No. 36. Notification of Waste Subject to Land Disposal Restrictions, EG&G Idaho.
- 4-37. IMWI Reference No. 37. Treatment, storage, and disposal capabilities database survey form (write-on).
- 4-38. IMWI Reference No. 38. Data Chem form EPRW-B, Environmental Water Report (Analytical Results).
- 4-39. IMWI Reference No. 39. EG&G Idaho, "Mixed and Low-Level Waste Treatment Facility Project—Appendix B—Waste Stream Engineering Files Part 1, Mixed Waste Streams," EGG-WMO-10244, September 1992.
- 4-40. IMWI Reference No. 40. R. D. Falconer, EPA Hazardous Waste Codes Found in INEL Stored TRU Waste Content Codes, EDF-RWMC-41 Revision 2, June 30, 1993.
- 4-41. IMWI Reference No. 41 was not used in the Profile Sheets in this report.
- 4-42. IMWI Reference No. 42. Letter from C. R. Edinborough, EG&G Idaho, to C. M. Barnes, EG&G Idaho, "ERDP 2802 Final Report," CRE-03-90, August 15, 1990.
- 4-43. IMWI Reference No. 43. L. G. Gale, "Characterization of Incoming Waste," EDF-IWPF-0021, January 7, 1993.
- 4-44. IMWI Reference No. 44. Radioactive Waste Management Information System (RWMIS), EG&G Idaho, Idaho Falls, Idaho, June 1993.
- 4-45. IMWI Reference No. 45. C. J. Barnard, "Inventory Analysis of Stored Transuranic (TRU) Waste at the RWMC," WM-PD-90-003 Rev. 1, Table A-2, June 30, 1993 (Draft).
- 4-46. IMWI Reference No. 46 was not used in the Profile Sheets in this report.
- 4-47. IMWI Reference No. 47. Code of Federal Regulations, 40 CFR 268, "Land Disposal Restriction," Office of the Federal Register, July 1, 1992.
- 4-48. Ravio, B. D., D. D. Pace, *Preliminary EPA Hazardous Constituents Design Basis Concentrations for ALLW Treatment Services*, EOF PSPI-01554G-04, January 18, 1994.
- 4-49. Argyle, M. D., A. L. Rubert, J. C. Tozèr, L. Meikle, *INEL Radioactive Waste Stream Characterization Data (DRAFT), Volume 3 Mixed and Non-Mixed Alpha-Low-Level Waste (ALLW)*, EGG-WM-10909, August 1993.

- 4-50. Gratson M. W., "Hazardous Stored Waste Source Term For the RWMC's TSA," Letter to J. J. Riedesel, MWG-05-90, with Attachment "Hazardous Stored TRU Waste Source Term For The RWMC's TSA," EDF-ENV-003, February 5, 1990.
- 4-51. Kudera, D. E., *Hazardous Waste Constituents of INEL Contact-Handled Stored Transuranic Waste*, EDF RWMC-369, dated May 19, 1989.
- 4-52. Falconer, R. D., *EPA Hazardous Waste Codes Found In INEL Stored Waste Content Codes*, EDF RWMC-421, Rev. 2, dated June 30, 1993, information as integrated into the Reference 4-1 (IMWI) database and report.
- 4-53. Falconer, R. D., *Estimation of Polychlorinated Biphenyl (PCB)-Contaminated Waste Stored In the Transuranic Storage Area (TSA)*, EDF RWMC-604, dated June 3, 1993.
- 4-54. Schafer, J. J., Answers to R. Rothman Data Request For Inclusion Of A Private Sector Alpha Low-Level Waste Treatment Facility In the INEL ER&WM EIS, Attachment to JJS-05-93, in response to a letter from P. J. Smith, PJS-21-93, dated October 12, 1993.
- 4-55. Ayers, A. L., *Preliminary Evaluation of Data Needs for Design of and Shipping to an ALLW Treatment Facility*, EDF PSPI-015546-02, dated December 21, 1993.
- 4-56. Gale, L. G., *Estimated Waste Matrix Compositions of ALLW for Treatment Design Basis*, EG&G EDF IWPF-0047, February 1994.
- 4-57. 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.

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