Technical Basis Document

Newly Generated Waste
Process Descriptions

September, 2001

TCP-98-03.1

Prepared for:

Battelle Columbus Laboratories
Decommissioning Project (BCLDP)
Columbus, Ohio

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This report, ***TCP-98-03.1, Newly Generated Waste Process Descriptions***, has been reviewed and approved by the following.

Approved By:

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J. Eide Date
TRU Waste Certification Program,
Site Project Manager

1.0 INTRODUCTION

Transuranic (TRU) waste generated by the Battelle Columbus Laboratories Decommissioning Project (BCLDP) will be characterized to address the objectives of the U.S. Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP) TRU Waste Characterization Program. Program requirements for TRU waste characterization are provided in the WIPP Hazardous Waste Permit, Waste Analysis Plan (WIPP-WAP). Implementation of these requirements is described in the *Transuranic Waste Characterization Quality Assurance Project Plan for the BCLDP TRU Waste Certification Program* (QAPjP). The WIPP-WAP and QAPjP require that a consistent, defensible, and auditable record of characterization information is collected, reviewed, and managed by the BCLDP for TRU waste. This record of information is referred to as acceptable knowledge (AK).

This Technical Basis Document, in conjunction with the *Building JN-1 Hot Cell Laboratory Acceptable Knowledge Document* and the AK Process Descriptions, has been developed to document the AK information used to characterize BCLDP TRU waste streams for disposal at WIPP as required by the QAPjP. Appendix A of this document will be maintained to show the summarization and characterization of each TRU waste stream identified in the AK Process Descriptions. Before packaging of each waste stream, an AK Process Description shall be written to describe the Acceptable Knowledge Process. These Process descriptions shall be numbered as TCP-98-03.1.1, TCP-98-03.1.2 and so on.

2.0 HISTORY

TRU waste is being generated during the decontamination and decommissioning of the Building JN-1 Hot Cell Laboratory at the West Jefferson North campus. The BCLDP has developed a logical sequence of AK progressing from the general facility history and mission to waste-specific information. Several hundred sources of documentation were reviewed to prepare TCP-98-03, *Building JN-1 Hot Cell Laboratory Acceptable Knowledge Document.* The primary purpose of TCP-98-03 is to present the TRU waste management information required by the QAPjP, including:

- Maps of the West Jefferson North site and Building JN-1 Hot Cell Laboratory facility
- Summaries of the history and mission for the site and laboratory
- Descriptions of the historical laboratory operations and waste management practices
- Type and quantity of potentially TRU waste contained in JN-1

During the AK review for TCP-98-03, potential TRU waste materials were identified and grouped into categories based primarily on the matrix of the waste. The waste was then characterized as it existed in the building, knowing that many of the materials (hydraulic oil, liquids, etc.) would require further processing to be eligible for disposal at WIPP. In addition, non-waste materials (e.g., light bulbs, leaded glass, and lead shielding) were characterized in advance of remediation. This materials assessment and the supporting AK source documentation will be used as the basis for subsequent TRU waste stream segregation and characterization activities. TCP-98-03 also provides the basis for the following:

- Defense waste justification
- Spent nuclear fuel and high level waste discussions
- JN-1 Hot Cell Laboratory standard facility radionuclide distribution

AK Process Descriptions which describe waste generating processes and characterize TRU waste streams have been developed to document the TRU waste stream AK information required by the QAPjP. The AK Process Descriptions are prepared in accordance with TC-AP-03.1, *Collection, Review, and Management of Acceptable Knowledge Documentation*, to create an auditable record and road map to the original sources of AK. In addition to describing the current TRU waste generating processes, the AK Process Descriptions define the inventory to be processed and the original waste generating activities. Each process waste stream is described in detail including:

- Description of the waste matrix
- Process flow diagrams
- Waste stream identification number
- Generation area
- Projected waste stream volume and generation dates
- Radionuclides
- U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers (HWNs)
- TRUCON Content Codes
- Summary Category and Waste Matrix Code (WMC)
- Waste Matrix Code Group
- Waste Material Parameters and weight ranges
- Resource Conservation and Recovery Act (RCRA) characterization rationale
- Toxic Substance Control Act (TSCA) waste determination

Appendix A of this document will be maintained to provide a current list of BCLDP TRU process waste streams and document the confirmation analyses requirements. This information will be incorporated in the TRU Waste Stream Profile Forms and Waste Stream Summary Reports in accordance with TC-AP-01.1.1, *Completion of TRU Waste Stream Profile Form.*

3.0 References

TCP-98-02, *Transuranic Waste Characterization Quality Assurance Project Plan for the BCLDP TRU Waste Certification Program,* Battelle Columbus Laboratories Decommissioning Project.

TCP-98-03, *Building JN-1 Hot Cell Laboratory Acceptable Knowledge Document,* Battelle Columbus Laboratories Decommissioning Project.

TC-AP-01.1.1, *Completion of TRU Waste Stream Profile Form*, Battelle Columbus Laboratories Decommissioning Project.

TC-AP-03.1, *Collection, Review, and Management of Acceptable Knowledge Documentation,* Battelle Columbus Laboratories Decommissioning Project.

NMED 1999. Waste Isolation Pilot Plant (WIPP) Hazardous Waste Permit, New Mexico Environmental Department, #NM4890139088, State of New Mexico.

TCP-98-03.1.1, *Repackaging of JN-1 Transfer/Storage Pool Filter Change-Out Waste*

TCP-98-03.1.2, *Repackaging of Building JN-1 Clean-UP Waste Containers*

TCP-98-03.1.3, *TRU Waste Laundry Decontamination*

TCP-98-03.1.4, *Pressure Wash Filters*

APPENDIX A TRU Waste Streams and Analysis Requirements

Waste Stream ID	Waste Stream Description	TRUCON	Required Analysis[a]	EPA HWNs	WMC	Waste Material Parameters and Weight %		Reference
3211-01	Pool Water Filter Resin	BC321B	1, 2, 3, 4, 5, 6, 7	None	S3211	Organic Matrix (resin) Other Inorganic Material Cellulosics	70-80% 20-30% <5%	TCP-98-03.1.1
5410-01	Pool Water Prefilter and Debris	BC321A	1, 2, 6, 7	None	S5410	Other Inorganic Material Organic Matrix Plastic Cellulosics Rubber Iron-based metal/alloys	24-73% 7-17% 5-11% 3-61% 1-3% <1%	TCP-98-03.1.1
5410-02	TRI-NUC Filters	SQ121 (CH) BC321A (RH)	1, 2, 6, 7	None	S5410	Iron-based Metals/Alloys Aluminum-based Metals Plastics Other Inorganic Materials Organic Matrix	47% <1% 41% 6% 6%	TCP-98-03.1.2
5190-01	Inorganic Debris	SQ122 (CH) BC321A, BC322A (RH)	1, 2, 6, 7	None	S5190	Other Inorganic Material Iron Based Metal/Alloys Aluminum-based Metals Rubber Other Metals	2-40% 50-90% 0-44% <1% 0-23%	TCP-98-03.1.2
5190-02	Hazardous Inorganic Debris	SQ122 (CH) BC321A, BC322A (RH)	1, 2, 6, 7	D005,D007,D008, D009,D011,F001, F002,F005	S5190	Other Inorganic Material Iron Based Metal/Alloys Aluminum-based Metals Plastics Rubber Other Metals	2-20% 11-89% 1-86% 0-4% <1% 0-8%	TCP-98-03.1.2
5390-01	Organic Debris	SQ121 (CH) BC321A (RH)	1, 2, 6, 7	None	S5390	Plastic Rubber Cellulosics Iron-based Metal/Alloys Aluminum-based Metal Other Metals Organic Matrix Other Inorganic Material	52-74% 10-17% 7-20% 0-2% 0-1% <1% 3-4% 3-4%	TCP-98-03.1.2

Notes: a.
1 = Visual Examination
2 = Headspace Gas (CH-TRU)
3 = Solid Sample total VOCs (CH-TRU)
4 = Solid Sample total SVOCs (CH-TRU)
5 = Solid Sample total VOCs (CH-TRU)
6 = Nondestructive Assay (CH-TRU)
7 = Radiological Confirmation (RH-TRU)

APPENDIX A TRU Waste Streams and Analysis Requirements

Waste Stream ID	Waste Stream Description	TRUCON	Required Analysis[a]	EPA HWNs	WMC	Waste Material Parameters and Weight %		Reference
5390-02	Hazardous Organic Debris	SQ121 (CH) BC321A (RH)	1, 2, 6, 7	D005,D007,D008 D009,D011,F001, F002,F005	S5390	Plastic Cellulosics Rubber Other Inorganic Material Iron-Based Metal/Alloys Aluminum-Based Metal Other Metals Organic Matrix	12-68% 19-63% 0-22% 4-20% 0-7% 0-5% 0-4% 2-9%	TCP-98-03.1.2
3150-01	Slugs	SQ122 (CH) BC314 (RH)	1, 2, 3, 4, 5, 6, 7	D004,D005,D006, D007,D008,D009, D011	S3150	Inorganic Matrix Plastics (residual styrofoam)	100% <1%	TCP-98-03.1.2
5410-03	Laundry Sock Filters and Lint	SQ121 (CH) BC321A (RH)	1, 2, 6, 7	D005,D007,D008 D009,D011,F001, F002,F005	S5410	Cellulosics Plastic Organic Matrix Other Inorganic Material Iron-based metal/alloys	50-60% 10-20% 10-20% 10-20% <5%	TCP-98-03.1.3
3129-01	Laundry Sludge	SQ121 (CH) BC321A (RH)	1, 2, 3, 4, 5, 6, 7	D005,D007,D008 D009,D011,F001, F002,F005	S3129	Cellulosics Organic Matrix Other Inorganic Material	10-20% 10-20% 60-80%	TCP-98-03.1.3
5410-04	Pressure Wash Filters	SQ121 (CH) BC321A (RH)	1, 2, 6, 7	None	S5410	Plastic Cellulosics Organic Matrix Rubber Other Inorganic Material	3-11% 4-15% 28-45% 1-6% 23-63%	TCP-98-03.1.4

Notes: a.
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4 = Solid Sample total SVOCs (CH-TRU)
5 = Solid Sample total VOCs (CH-TRU)
6 = Nondestructive Assay (CH-TRU)
7 = Radiological Confirmation (RH-TRU)