Mr. Steve Zappe, WIPP Project Leader  
Hazardous Waste Permits Program  
New Mexico Environment Department  
2905 E. Rodeo Park Drive, Bldg. 1  
Santa Fe, NM 87505-6303

RE: Transmittal of the Approved Revised Waste Stream Profile Form Number SR-W027-FB-Pre86-C for the Central Characterization Project at the Savannah River Site

Dear Mr. Zappe:

Waste Stream Profile Form (WSPF) SR-W027-FB-Pre86-C was previously submitted to the NMED in September 23, 2002. The Carlsbad Field Office (CBFO) has recently evaluated a revision to WSPF SR-W027-FB-Pre86-C and concluded that the revised WSPF is complete and that the waste stream determinations were made in accordance with CBFO procedures and guidance. The CBFO therefore approves the revised WSPF for waste characterization at the Savannah River Site (SRS) through the use of the Central Characterization Project.

The revision was required because some of the information contained in the original WSPF submittal to the CBFO was inadvertently changed during the review process. An internal Corrective Action Report has been written to address this issue and prevent recurrence. Please note that no drums were shipped to the Waste Isolation Pilot Plant based on the previously approved WSPF.

The revisions to WSPF SR-W027-FB-Pre86-C include the following:

- Waste Stream Information Section – revised Waste Matrix Code Group from Heterogeneous Debris Waste (S5400) to Combustible Waste (S5300 Organic Debris)
- Batch Data report numbers supporting this waste stream characterization – revised to “see CIS Attachment 3”
- Waste Stream Information Section - added hazardous waste numbers D018, D019, D022, D029, D039, D040, and D043
- Required Information Section – updated revision date for CCP-AK-SRS-2 to “October 21, 2002”
- Sampling and Analysis Information - references to procedures were changed to “see CIS Attachment”
- Continuation Sheet – removed document number CCP-AK-SRS-2 and moved the procedures for Radiography, Visual Examination, and Headspace Gas to the CIS Attachment 3 (cover page)
Mr. Steve Zappe

October 29, 2002

- AK Source Documents, Attachment 1 – added two new references “D48” and “H39”
- AK Summary – revised Waste Matrix Code Group from Heterogeneous Debris Waste (S5400) to Combustible Waste (S5300 Organic Debris)
- AK Summary, RCRA Determinations heading – added hazardous waste numbers to the Toxicity and Summary discussions.
- AK Summary, Physical Form heading – removed table “Savannah River Site Waste Matrix Constituents” and discussion pertaining to the table and provided support information regarding the Waste Matrix Code Group.
- CIS Attachment 3 (cover page) – added two Visual Examination procedures

If you have any questions, please contact me at (505) 234-7257.

Sincerely,

Kerry W. Watson
CBFO Assistant Manager
Office of National TRU Program

Enclosure

cc: w/enclosure
J. Bearzi, NMED
P. Roush, WTS
J. Bennett, WTS
L. Greene, WTS
CBFO Mailroom
Waste Stream Profile
Number: SR-W027-FB-Pre86-C, Revision 1

Generator site name: Savannah River
Technical contact: Adela M. Cantu

Generator site EPA ID: SC1890008989
Date of audit report approval by NMED: February 27, 2002
Title, version number, and date of documents used for WAP Certification:

SEE CONTINUATION SHEET

Did your facility generate this waste? □ Yes ☑ No
If no, provide the name and EPA ID of the original generator: Savannah River, SC1890008989

Waste Stream Information

WIPPID: ☑ Yes □ No
SR-W027-FB-Pre86-C

Waste Matrix Code Group: S5000
Combustible Waste (S5300 Organic Debris)
Waste Stream Name: Pre 1986 Waste from FB Line

Defense TRU Waste: ☑ Yes □ No
Check One: ☑ CH □ RH

Number of SWBs 0 Number of Drums 6,994
See CIS Attachment 3
Check Batch Data report numbers supporting this waste stream characterization:
Table 1
F001, F002, F003, F005, U151, U002, D005, D006, D007, D008, D009, D011, D018, D019, D022, D029, D039, D040, D043

Applicable EPA Hazardous Waste Codes: SR 225A and SR 225C
Applicable TRUCON Content Codes:

Required Program Information

Map of site: CCP-AK-SRS-2, October 21, 2002, Attachment 2
Facility mission description: CCP-AK-SRS-2, October 21, 2002, Section 4.1.4

Description of operations that generate waste: CCP-AK-SRS-2, October 21, 2002, Section 4.3

Waste identification/categorization schemes: CCP-AK-SRS-2, October 21, 2002, Section 4.4

Types and quantities of waste generated: CCP-AK-SRS-2, October 21, 2002, Section 5.4

Correlation of waste streams generated from the same building and process, as appropriate: CCP-AK-SRS-2, October 21, 2002, Section 4.2.2

Waste certification procedures: SEE CONTINUATION SHEET

Required Waste Stream Information

Area(s) and building(s) from which the waste stream was generated:
CCP-AK-SRS-2, October 21, 2002, Section 5.1

Waste stream volume and time period of generation:
CCP-AK-SRS-2, October 21, 2002, Section 5.2

Waste generating process description for each building:
CCP-AK-SRS-2, October 21, 2002, Section 4.3

Process flow diagrams: CCP-AK-SRS-2, October 21, 2002, Section 4.3, Figures 4-4 & 4-5

Material inputs or other information identifying chemical/radionuclide content and physical waste form:
CCP-AK-SRS-2, October 21, 2002, Section 5.4

Amc 10/28/02
Waste Stream Profile
Number: W027-FB-Pre86-C, Revision 1

Which Defense Activity generated the waste: (check one)

- □ Weapons activities including defense inertial confinement fusion
- □ Verification and control technology
- □ Defense nuclear waste and material by products management
- □ Defense nuclear waste and materials security and safeguards and security investigations

Supplemental Documentation
Process design documents: D43, D47 (see Attachment 1 – AK Source Documents)
Standard operating procedures: C67, D37, P12, P14, P15, P16, P17, P18, P19, P20, and P21
Safety Analysis Reports: D41, D42
Waste packaging logs: M27
Test plans/research project reports: D33
Site databases: C77, D01, M19, M29, M31, M32

Information from site personnel: C18, C21, C22, C24, C25, C26, C27, C28, C29, C31, C32, C53, C64, C55, C56, C67, C71, C76, C77, C79, C82, M38

Standard industry documents: N/A
Previous analytical data: C63, D31, D50, M23
Material safety data sheets: C04, M30
Sampling and analysis data from comparable/surrogate Waste: N/A
Laboratory notebooks: N/A

Sampling and Analysis Information:
Radiography See CIS Attachment 3, page 2
Visual Examination See CIS Attachment 3, page 2

Headspace Gas Analysis
VOC: See CIS Attachment 3, page 2
Flammable: See CIS Attachment 3, page 2
Other gases (specify): NA

Homogeneous Solids/Soils/Gravel Sample Analysis
Total metals: NA (Not homogeneous solids/Soil/Gavel)
PCBs: NA (Not homogeneous solids/Soil/Gavel)
VOCs: NA (Not homogeneous solids/Soil/Gavel)
Nonhalogenated VOCs: NA (Not homogeneous solids/Soil/Gavel)
Semi-VOCs: NA (Not homogeneous solids/Soil/Gavel)
Other (specify): NA (Not homogeneous solids/Soil/Gavel)

Waste Stream Profile Form Certification:
I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Adela M. Cantu SRS Site Project Manager
Signature of Site Project Manager Printed Name and Title Date

NOTE: (1) Use back of sheet or continuation sheets, if required.
(2) If radiography, visual examination, headspace gas analysis, and/or homogeneous solids/soils/gravel sample analysis were used to determine EPA Hazardous Waste Codes, attach signed Characterization Information Summary documenting this determination.
Continuation Sheet:

NOTE: Currently the CCP Program at SRS is running jointly between SRS and CCP. In the future, these two programs will be collapsed into a single CCP Program.

WAP Certification Documents:


Waste Certification Procedures:

CCP-TP-030, rev. 5, CCP WWIS Data Entry and TRU Waste Certification, June 27, 2002.
The following list is taken from CCP-AK-SRS-2, Central Characterization Project, Acceptable Knowledge Summary Report For Savannah River Site SR-W027-FB-Pre86-C


C82: Record of Communication-Interview of Mr. Odum and Mr. Maloney. Interview by J. Whitworth. December 4, 2001.


M19: COBRA Conversion Table. 05/31/95.


M27: Pre-86 AK Tracking Spreadsheet. 2002.


M30: MSDSs. Obtained from commercial sites and/or SRS.

M31: Steve Mentrup's Access Database. Steve Mentrup.


M38: Unpublished database spreadsheet. E-mail message from Stephanie Fevig, IT Corp 04/30/02.

M39: Spreadsheets pertaining to RTR data.


Overview:

The SRS facility mission was to process and convert dilute plutonium (Pu) solution into highly purified weapons grade Pu metal. As a result of various activities conducted in support of the mission (e.g., operation, maintenance, construction, repair, cleaning, and facility modifications), the facility generated TRU waste. Waste contaminated primarily with defense-related Pu material was generated by these activities at SRS.

Beginning in 1954, the SRS FB-Line facility conducted atomic energy defense activities consistent with Section 10101(3) of the Nuclear Waste Policy Act of 1982. Defense Waste generated from these activities is consistent with guidance from the Carlsbad Field Office for waste disposal at the WIPP. The FB-Line (formerly JB-Line or FJB-Line) was a defense nuclear materials production facility.

This summation of the AK Summary Report includes information to support Waste Stream Profile Form (WSPF) Number SR-W027-FB-PRE86-C-1 for Heterogeneous Debris Waste relating to the facility's history, configuration, equipment, process operations, and waste management practices. Information contained in this summary was obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents including SRS Burial Ground Records and databases, and interviews with operational and waste management personnel. Additional details are discussed in CCP-AK-SRS-2, Central Characterization Project Acceptable Knowledge Summary Report for Savannah River Site SR-W027-FB-PRE86-C.

Waste Stream Identification Summary:

<table>
<thead>
<tr>
<th>Site Where TRU Waste Was Generated:</th>
<th>Savannah River Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Stream Name:</td>
<td>Pre-1986 Waste from FB-Line</td>
</tr>
<tr>
<td>Waste Stream Number:</td>
<td>SR-W027-FB-PRE86-C, Revision 1</td>
</tr>
<tr>
<td>Dates of Waste Generation:</td>
<td>December 1972 – March 1986</td>
</tr>
<tr>
<td>Facility Where TRU Waste Was Generated:</td>
<td>Building 221-F, FB-Line</td>
</tr>
<tr>
<td>Waste Stream Volume:</td>
<td>6,994 drums</td>
</tr>
<tr>
<td>(including approximately 3,462 that could be low-level waste containers)</td>
<td></td>
</tr>
<tr>
<td>(including 386 85-gallon overpack drums)</td>
<td></td>
</tr>
<tr>
<td>Summary Category Group:</td>
<td>S5000 – Debris Waste</td>
</tr>
<tr>
<td>Waste Stream TWBIR Identification:</td>
<td>SR-W027-221F-HET</td>
</tr>
<tr>
<td>Waste Stream MWIR Identification:</td>
<td>SR-W027</td>
</tr>
<tr>
<td>Site-Specific Item Description Code:</td>
<td>IDC 001 (Job control waste)</td>
</tr>
<tr>
<td>Waste Matrix Code Group:</td>
<td>Combustible Waste</td>
</tr>
<tr>
<td>RCRA Hazardous Waste Codes:</td>
<td>D005, D006, D007, D008, D009, D011, D018, D019, D022, D029, D039, D040, D043, F001, F002, F003, F005, U002, U151</td>
</tr>
<tr>
<td>Waste Matrix Code:</td>
<td>S5300 – Organic Debris</td>
</tr>
</tbody>
</table>

This waste stream is assigned the waste matrix code (WMC) S5300 "Organic Debris" because the waste is dominantly organic as defined by the DOE Waste Treatability Group Guidance document.
TRUPACT-II Content Code (TRUCON): SR 225A & SR 225C

Waste Stream Description:

The process by which the waste streams under consideration were generated is described in detail in CCP-AK-SRS-2 Section 4.3 with detailed process flow diagrams. Much of the work performed in FB-Line took place within areas contaminated with radioactive material. Waste materials and items contained in this stream result from various activities that took place in these areas. Routine operational activities (housekeeping/cleaning, process equipment adjustments, radiological surveys, etc.) and preventive and corrective maintenance were the major waste producers. Other contributing activities included facility modifications, decontamination, sump cleanout, absorption of liquids, glove replacement on process cabinets and gloveboxes, various mechanical and electrical repairs, maintenance, and changeouts of process equipment, piping, cabinet panels, and other equipment.

The waste in this waste stream was generated between December 1972 and March 1986.

Example of Typical FB-Line Waste Materials

<table>
<thead>
<tr>
<th>Item Type</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper/wipes</td>
<td>Mop heads/handles</td>
</tr>
<tr>
<td>Valves</td>
<td>Pumps/motors</td>
</tr>
<tr>
<td>Planchettes</td>
<td>Glassware/Labware</td>
</tr>
<tr>
<td>Agitators</td>
<td>Plexiglas/Lexan®</td>
</tr>
<tr>
<td>Gloves-lead/rubber/plastic</td>
<td></td>
</tr>
<tr>
<td>Instruments</td>
<td>Mirrors</td>
</tr>
<tr>
<td>Hot plates</td>
<td>Scales</td>
</tr>
<tr>
<td>Thermometers-mercury</td>
<td>Ceramics</td>
</tr>
<tr>
<td>Lead columnators</td>
<td>Brooms</td>
</tr>
<tr>
<td>Fluorescent bulbs</td>
<td>Fluorescent ballasts</td>
</tr>
<tr>
<td>Paint cans</td>
<td>Wood</td>
</tr>
<tr>
<td>Rotameters</td>
<td>Filters</td>
</tr>
<tr>
<td>Rubber-miscellaneous</td>
<td>Leather</td>
</tr>
<tr>
<td>Crucibles</td>
<td>Sponges</td>
</tr>
<tr>
<td>Frits</td>
<td>Tape</td>
</tr>
<tr>
<td>Metals- aluminum, copper, iron, lead, cadmium, stainless steel, tantalum, tungsten</td>
<td>Bakelite™</td>
</tr>
<tr>
<td>Sand (MgO)/Calcium Slag</td>
<td>Insulation</td>
</tr>
<tr>
<td></td>
<td>Metal hardware-nuts/bolts, etc.</td>
</tr>
<tr>
<td></td>
<td>Cloth-uniforms/rgs</td>
</tr>
<tr>
<td></td>
<td>Tool</td>
</tr>
<tr>
<td></td>
<td>Plastic-bottles/film/Sheeting</td>
</tr>
<tr>
<td></td>
<td>Lead-bricks/sheets/gloves</td>
</tr>
<tr>
<td></td>
<td>Aerosol cans-punctured &amp; unpunctured-paint/Magnaflux®/detergents/insecticides/Scene®/Spot Check®</td>
</tr>
<tr>
<td></td>
<td>Carbons-cardboard/plastic</td>
</tr>
<tr>
<td></td>
<td>Absorbents-Soda Ash/Celite®/Oil Dr®</td>
</tr>
<tr>
<td></td>
<td>Flashlights &amp; flashlight batteries</td>
</tr>
<tr>
<td></td>
<td>Cabinet sweepings</td>
</tr>
<tr>
<td></td>
<td>Metal 5-gallon pails</td>
</tr>
<tr>
<td></td>
<td>Shipping containers</td>
</tr>
<tr>
<td></td>
<td>Oils-hydraulic</td>
</tr>
<tr>
<td></td>
<td>Sump waste</td>
</tr>
<tr>
<td></td>
<td>Polystyrene/ polypropylene/ PVC</td>
</tr>
<tr>
<td></td>
<td>Concrete</td>
</tr>
</tbody>
</table>

The above table identifies several items that are prohibited from certification and disposal at the WIPP. During the confirmation process, the waste containers undergo 100% RTR to ensure that prohibited items are not included in the waste drums as specified in the operating procedures.

Point of Generation

Location

The SRS is located in South Carolina on approximately 310 square miles. It is bounded on the southwest by the Savannah River and occupies parts of Aiken, Barnwell, and Allendale counties. The FB-Line facility is located inside the 221-F Building in the 200-F Area of the SRS.
Area and Building Operation

All waste from this waste steam described in the AK Summary Report (CCP-AK-SRS-2) were generated by the FB-Line facility located inside the 221-F Canyon Building. FB-Line partially occupies the third and fourth levels and all of the fifth and sixth levels of Building 221-F. Waste was generated from areas inside process cabinets or gloveboxes, huts erected around glovebox entry ports, or areas contaminated with radioactive material adjacent to the process cabinets/gloveboxes.

Generating Processes

Description of Waste Generating Process

The waste streams under consideration were generated in FB-Line as the result of operations related to processes involving concentration and refinement of dilute Pu solutions to solid Pu buttons usable in weapons production.

Primary Processes

Purified Pu isotopes contained in a dilute nitric acid and hydroxylamine nitrate solution were transferred from the 221-F Canyon Building process to the FB-Line where it was processed to either Pu metal or plutonium oxide form.

The unit operations are concentration of plutonium nitrate by cation exchange, precipitation of Pu as a trifluoride, filtration, and washing, warm air-drying, oxidation, and reduction with calcium metal to purified Pu metal form. The waste was generated during operations of these processes. Waste materials from these operations and offsite scrap with recoverable amounts of Pu were recycled through the Recovery and Special Recovery process lines.

Maintenance/Housekeeping Activities

Maintenance and housekeeping activities conducted on FB-Line included the following:

- Glove repair and/or removal
- Equipment repair
- Construction- new cabinets
- Furnace, hydraulic lift, lighting fixture/bulb, and dumper station repair/change out
- Transfer/conveyor trolley repair/lubrication
- Cabinet window replacement
- Cabinet glove change out
- Drying/roasting filter or pan replacement
- Electrical repairs
- Cabinet exhaust pre-filter and High Efficiency Particulate Air (HEPA) filter replacement
- Plastic sleeve replacement from bag-out an bag-in operations
- Cabinet sweeping in dry cabinets
- Sump flushes/clean-outs
- Cabinet wipe downs in both the dry and pickling cabinets
- Spill cleanups of material contained by the cabinet and sump
- Material releases from the cabinet--cleanup and decontamination efforts
- Lead-lined glove replacements
- Repair of leaks
- Changing panels on cabinets and huts
- Equipment repair (valve replacement, etc.)
- Inspection and cleaning of exhaust ducts to remove any Pu accumulation
- Absorption of liquids
- Construction, breakdown, and disposal of huts adjacent to cabinets
- Bagging trash out of glove boxes and cabinets

These activities did not consistently generate TRU and/or low-level waste during the waste generation time period.
RCRA Determinations

Hazardous Waste Determinations

Ignitability

Ignitable free liquids such as Magnaflux®, Spot Check® were used from aerosol cans. Ignitable liquids in unpunctured aerosol containers would be detected and the drum would be rejected during the RTR process. In addition, free liquids in containers greater than 1 inch on the bottom of the container or greater than 1% volume of the container would be detected in the drum and would be rejected by RTR. Only WIPP WAP compliant drums will be shipped to WIPP (i.e. less than or equal to 1 inch of liquid in internal containers and less than 1% of the waste containers volume).

Corrosivity

Under 40 CFR 261.22, a solid waste exhibits the characteristic of corrosivity if a representative sample of the waste has either of the following properties:

- It is aqueous with a pH less than or equal to 2, or greater than or equal to 12.5, as determined by a pH meter using Method 9040 in "Test Methods for Evaluation Solid Waste, Physical and Chemical Methods," EPA Publication SW-846.

- It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55 degrees Celsius (130 degrees Fahrenheit) as determined by its test method specified in National Association of Corrosion Engineer (NACE) Standard TM-01-69 as standardized in SW-846.

FB-Line personnel were directed in 1976 to rinse waste to remove all acid or caustic-exposed combustibles and package them with enough "Celite" (diatomaceous earth) to absorb any excess liquid. Wet solid waste from the Mechanical Line and other dry cabinets were to be handled by a special procedure. By 1977, any free liquids disposed from the FB-Line were to be absorbed on appropriate media, such as soda ash, Celite®, or Oil-Dri® in a 3-to-1 ratio of absorbent to liquid. This waste is not an aqueous liquid. As determined by radiography and visual examination, none of the drums to be shipped contained greater than 1 volume percent liquid (present as residual liquid). The corrosive characteristic (D002) does not apply to the waste.

Reactivity

The waste stream does not meet the characteristic of reactivity as defined under RCRA 40 CFR 261.23. The waste materials are stable based on procedures used during FB-line processing and will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors or fumes when mixed with water.

The materials do not contain sulfides and are not capable of detonation or explosive reaction. Further, this waste does not present a compatibility hazard due to the chemicals identified with each other with the packaging of the waste. Therefore, the waste code for reactivity (D003) is not assigned to this waste stream.

Calcium metal was used in the FB-Line reduction process. Waste calcium metal was segregated and managed separate from typical cabinet waste. Calcium waste that was not radiologically contaminated was disposed as hazardous waste rather than TRU waste otherwise it was recycled with cabinet sweepings or with slag and crucible scrap through the D-1 dissolver. The calcium that would be potentially present in the waste is oxide, which is nonreactive.

Toxicity

The presence of RCRA toxicity characteristic metals arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver was investigated for this waste stream based information presented in the TWIBR and other programmatic documents used to assign waste codes for the waste stream SR-W027-221F-HET; which this waste stream is similar. This list of applicable hazardous waste numbers is identical to the list employed for other buildings and the analytical laboratory
waste streams at SR... herefore, the hazardous contaminant list may include codes that are not appropriate for this waste stream. As a result, none of the documentation reviewed, including generator interviews and FB-Line programmatic documents, identified any potential sources for selenium and arsenic; therefore, hazardous waste numbers for selenium and arsenic are not assigned to this waste stream.

Barium (D005)

Although no documentation reviewed identified a potential source of barium in FB-Line waste, barium is a chemical component that was used in filter media and is present in other wastes resulting from metallurgy processes. No analytical data is available to exclude the potential for barium to be present in the waste. D005 is conservatively applied by SRS and is assigned to this waste stream.

Cadmium (D006)

The FB-Line Safety Analysis Report indicates that cadmium was used as neutron shielding for cation exchange columns, although it is expected to be uncommon in TRU waste. In addition the post-closure permit for TRU pads 1 – 5, states that cadmium served as a corrosion inhibitor and neutron absorber on various pieces of old equipment. Cadmium was listed with a 0 – 10% waste component for the FB-Line waste. Therefore, D006 has been conservatively assigned to the subject waste stream.

Chromium (D007)

Chromium was used as a biocide ingredient in the building air conditioning system water; therefore waste chromium may be present waste associated with the air conditioning system. Chromium contaminated waste may be a component of the corrosion products in stainless steel ducts from decontamination and removal efforts. Therefore, D007 has been conservatively assigned to the waste stream.

Lead (D008)

Lead was used throughout the FB-Line as radiation shielding; therefore, D008 has been conservatively assigned to the waste stream. The lead in the TRU waste could be in the form of lead sheets and bricks or as a component of a piece of equipment, such as lead-lined cabinet gloves or leaded glass for cabinet panels. Only nonhazardous flashlight batteries were discarded as TRU waste; as a result, no lead-acid batteries are part of the waste stream.

Mercury (D009)

Mercury was identified in the chemical flow sheet of the FB-Line for dissolving aluminum. The JB-Line Operation manual describes the use of mercuric nitrate as a process chemical. The mercury was part of instruments used in the production process that were replaced according to a post-closure permit for TRU pads 1-5. Based on the potential sources and other information summarized above, D009 has been conservatively assigned to the subject waste stream.

Silver (D011)

Silver solder was used for repairs that may have been disposed of as TRU waste as a component of electrical equipment. Silver was also used as a precipitant for chloride solutions. Waste contaminated with this solution or its precipitate may have been disposed of as TRU waste. It is difficult to determine whether sufficient quantities of solder or precipitant would be present in waste to support the assignment of a hazardous waste number. No analytical data is available to exclude the potential exclude silver from the waste. Therefore, D011 has been conservatively assigned to the waste stream.

Based on SRS documentation indicating the use of other chemicals, toxicity characteristic codes D018, D019, D022, D029, D039, D040, and D043 apply to this waste stream.
Summary

In summary, EPA hazardous waste numbers D005, D006, D007, D008, D009, D011, D018, D019, D022, D029, D039, D040, and D043 have been assigned to all drums of the waste stream.

Listed Waste
F-Listed and Other Solvents

Many chemicals were used as solvents and decontaminating agents. Based on document reviews and interviews the listed solvents used include acetone; TCE; toluene; xylene; halogenated organics; and isobutanol. Benzene may also have been used for its solvent properties.

In addition, trade-name products having listed solvents include the following:

- PVC Pipe Cement — MEK and cyclohexanone
- Magnaflux® (Spot Check developer) — acetone
- Magnaflux® (SKC-NF Cleaner-Remover) — 1,1,1-trichloroethane
- Raycohesive®/MOR-AD® — trichloroethylene, methylene chloride, 1,1,1-trichloroethane
- Swish® Aerosol — chlorinated hydrocarbons
- Paints — MEK, n-butanol, toluene (based on Imron® Enamel) and n-butyl acetate (based on Ceilcote®)

Based on this information, SRS has conservatively applied the following hazardous waste numbers to the subject waste stream: F001, F002, F003, and F005.

U- and P-Listed Chemicals

In June 1997, SRS conservatively applied hazardous waste numbers to numerous compounds for the various waste streams. However, SRS has since determined that U codes are not applicable for compounds except for Mercury either because the chemicals were not routinely used as pure commercial chemicals or as the sole active ingredient in trade-name products or because they would only have been disposed in solid waste once used.

In the case of acetone, SRS staff could not rule out the possibility that pure acetone might have been used in FB-Line and is present in spill cleanup materials; as a result, the hazardous waste number U002 has been conservatively applied. Also, SRS concluded that it is possible that pure mercury was used in FB-Line and is present in spill cleanup materials; as a result, the hazardous waste number U151 has also been conservatively applied to the subject waste stream.

Conclusion

The following EPA hazardous waste numbers are assigned to waste stream SR-W027-FB-Pre86-C constituents: D005, D006, D007, D008, D009, D011, D018, D019, D022, D029, D039, D040, D043, U002, U151, F001, F002, F003, and F005.

Polychlorinated Biphenyls

No capacitors or transformers were stored inside the FB-Line cabinets. There were PCB-containing capacitors that were part of reduction furnaces, but they were located outside of cabinets and were segregated from TRU waste when replaced. The annual PCB Inventory Change Report for calendar year 1984 stated that no large capacitors were in service at the SRS.

Oils, including hydraulic oils, were commonly used in the FB-Line during this time frame but Arochlor oils (PCB containing oils) were not. Therefore this type of PCB is not expected.
PCBs may also be present in fluorescent light ballasts. No fluorescent light were located inside of the cabinets (globe lights were used), there is the potential that this type of lighting was used to augment normal cabinet lights. In addition, fluorescent light ballasts may have been discarded as TRU waste during decontamination and removal efforts. This is the only type of PCB waste anticipated in this waste stream. As a conservative approach, fluorescent lights with ballasts have been identified as a prohibited item. RTR operators have been trained to look for light ballasts in drums and segregate drums that indicate the presence of these items.

Physical Form

Combustible is defined as “organic material capable of being burned, except that if the only combustible content of a package is plastic lining or wrapping used for contamination control purposes around incombustible objects or materials, the contents of the package as a whole may be considered noncombustible.”

Waste material parameters anticipated to be present in the waste stream include iron-based metals (and steel alloys), aluminum-based metals, other metals, other inorganic materials (such as glass and ceramic), cellulosics, rubber, plastics, inorganic matrix (solidified liquids), and steel and plastic packaging materials such as drums andliners. The physical form of this waste stream is organic debris > 80% and meets the definition of waste matrix code S5300. The waste stream contains materials such as plastics, rubber, paper, and cloth.

The approximate waste material parameters are examined during RTR and visual examination to ensure that the physical form conforms to the requirement of >80% debris and the majority is combustible.

Prohibited Items

This waste stream undergoes 100% RTR and visual examination as a quality control check for the RTR process. This process is used to determine that the containers do not include prohibited items, such as free liquids. This information is documented during the RTR process. In addition, packaging procedures required absorption or removal of liquids. By 1977, any free liquids disposed from the FB-Line as TRU waste were to be absorbed on appropriate media, such as soda ash, Celite®, and Oil-Dri® in a 3-to-1 ratio of absorbent to liquid.

The RTR and visual examination process is used to ensure that sealed containers present in the waste are less than the four-liter limit. This information is documented during the RTR process.

The RTR and visual examination process is used to ensure that aerosol cans have been punctured or they are removed from the waste drum. This information is documented during the RTR and visual examination process.

Potentially explosive electrical discharge plugs (also known as squibs) used in Halex® fire suppression systems located in the FB-Line facility were not disposed of as TRU waste because they were not located in gloveboxes or cabinets. In addition squibs were segregated during decontamination and removal efforts and not discarded as TRU waste.

Hydrazine, an explosive nitrate when dry, was used in the FB-Line Special Recovery operations up until 1986 as a dissolution process catalyst and poses an explosion hazard. Special precautions were taken to cleanup hydrazine spills in cabinets and send the solutions to F-Canyon recycle or waste tanks. In addition sumps were routinely flushed to remove possible Pu buildup. These flushes removed any hydrazine residue and were also transferred to F-Canyon. Because spills and process leaks were cleaned up immediately and slumps flushed periodically the presence of even trace amounts hydrazine liquid or dried hydrazine salt is unlikely.

Pyrophorics were not disposed in FB-Line waste streams. The most prevalent pyrophoric was Pu metal, which was valued product. Material possible contaminated with recoverable quantities of Pu metal were stored in vaults or processed through D-1 dissolver.
Headspace Gas/Volatile Orgn. Compound Information

Lot #1 of waste stream SR-W027-FB-Pre86-C consists of a total of 36 drums. Implementation of trans 1,2-dichloroethylene to the target analyte list was completed January 9, 2002 per the implementation schedule in July 18, 2001 letter from CBFO to the NMED and corresponding letter to generator sites from the CBFO. All samples in waste stream SR-W027-FB-Pre86-C contain the trans 1,2-dichloroethylene as part of the target analyte list.

Two tentatively identified compounds were identified in Lot 1. They are 2-methyl, 2-propanol and cyclohexanone. Neither of the TICS identified were found in more than 25% of the containers in Lot 1 or were listed in Appendix VIII of 40 CFR Part 261.

1,1,1-trichloroethane was identified as having a calculated UCL<sub>90</sub> value above the program required quantification limit of 10 parts per million per by volume (ppmv). Thirty-two of thirty-six samples in Lot 1 had hits above the method detection limit for 1,1,1-trichloroethane, with a maximum value of 239 ppmv and a measured mean value of 29.1ppmv. EPA codes F001 and F002 for spent halogenated solvents have been previously established by CCP-AK-SRS-2, Central Characterization Project Acceptable Knowledge Summary Report For Savannah River Site, SR-W027-FB-Pre86-C. The calculated UCL<sub>90</sub> value supports the AK document.

The specifics of this information are included in the attached Headspace Gas Summary report.

Radionuclide Information

Radiological Characterization

Waste from this stream is contaminated primarily with Pu, predominantly high Pu-239 waste consisting of the following radioisotopes and corresponding ranges of weight percent (wt %) distribution:

- Pu-238: 0-1 wt%, typically less than1%
- Pu-239: 70-95 wt%, typically 92-94% except for special campaigns
- Pu-240: 1-23 wt%, typically about 6% except for special campaigns
- Pu-241: 0-5 wt%, typically less than1%
- Pu-242: 0-3 wt%, typically less than1%
- Americium (Am)-241 (decay daughter of Pu-241)<sup>1</sup>: 0-1 wt%; typically less than1%
- Uranium (U, all isotopes): 0-70 wt%

High Pu-242 waste was generated from October 1972 – March 1973, March-July of 1975, and the first six months of 1979. The radioisotopes and corresponding ranges of weight percent (wt %) distribution are as follows:

- Pu-238: 0-1 wt%
- Pu-239: 0-4 wt%
- Pu-240: 2-32 wt%
- Pu-241: 1-11 wt%
- Pu-242: 52-96 wt%
- Am-241: trace
- U (all isotopes): 0-70 wt%

---

<sup>1</sup> Am-241 may be significantly higher than indicated because of in growth from radiological decay of Pu-241 during years of storage.
CHARACTERIZATION INFORMATION SUMMARY

SR-W027-FB-Pre86-C, LOT 1
WSPF: SR-W027-FB-Pre86-C, Revision 1

10/28/02

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RTR / VE Summary of Prohibited Items and AK Confirmation ..................................................................................................007

Reconciliation with Data Quality Objectives .................................008
SPQAQO signature indicates that the information presented in this package is consistent with analytical batch reports.

SPM signature indicates concurrence with all information presented in this report.

List of procedures used:

**Radiography:**
CCP-TP-011, CCP Radiography Inspection Operating Procedures, May 16, 2002

**Visual Examination:**
SW15.7-SOP-TVEF-01, TVEF Operations, August 1, 2001
SW15.7-SOP-TVEF-01, TVEF Operations, April 11, 2001
SW15.7-SOP-TVEF-01, TVEF Operations, October 30, 2001
SW15.7-SOP-TVEF-01, TVEF Operations, August 27, 2001

**Headspace Gas Analysis:**
CCP-TP-007, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Procedure, July 23, 2002
CCP-TP-007, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Procedure, January 28, 2002
CCP-TP-009, CCP Single Sample Manifold Data Handling Procedure, January 30, 2002
CCP-TP-029, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Methods and Equipment Calibration, January 30, 2002
CCP-TP-032, CCP Single Sample Manifold Data Validation Procedure, January 29, 2002

**Data Generation Review (SRS):**

**Project Level Data Validation/DQO Reconciliation:**
CCP-TP-001, CCP Project Level Data Validation and Verification, May 15, 2002
CCP-TP-001, CCP Project Level Data Validation and Verification, March 8, 2002
CCP-TP-002, CCP Reconciliation of DQOs and Reporting Characterization Data, June 19, 2002
CCP-TP-002, CCP Reconciliation of DQOs and Reporting Characterization Data, June 6, 2002
CCP-TP-002, CCP Reconciliation of DQOs and Reporting Characterization Data, March 7, 2002
CCP-TP-003, CCP Sampling Design and Data Analysis for RCRA Characterization, August 23, 2002
CCP-TP-003, CCP Sampling Design and Data Analysis for RCRA Characterization, June 3, 2002
CCP-TP-003, CCP Sampling Design and Data Analysis for RCRA Characterization, March 20, 2002

CCP-TP-030, CCP WWIS Data Entry and TRU Waste Certification, June 27, 2002
CCP-TP-030, CCP WWIS Data Entry and TRU Waste Certification, May 21, 2002
### Attachment 3 Table 1 - Correlation of Container Identification Numbers to Batch Data Report Numbers

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## Attachment 2 - UCl₉₀ Evaluation Form

**WSPF #:** SR-W027-FB-Pre86-C

**Revision:** 1

**Waste Stream Lot Number:** 102828

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<td>—</td>
<td>—</td>
<td>—</td>
<td>10</td>
<td>Yes</td>
<td>F001, F002</td>
</tr>
<tr>
<td>m-Xylene</td>
<td>36</td>
<td>1</td>
<td>44.3</td>
<td>3.80</td>
<td>6.85</td>
<td>5.29</td>
<td>10</td>
<td>Yes</td>
<td>F001, F002</td>
</tr>
<tr>
<td>p-Xylene</td>
<td>36</td>
<td>1</td>
<td>44.3</td>
<td>3.80</td>
<td>6.85</td>
<td>5.29</td>
<td>10</td>
<td>Yes</td>
<td>F001, F002</td>
</tr>
<tr>
<td>o-Xylene</td>
<td>36</td>
<td>1</td>
<td>9.20</td>
<td>2.89</td>
<td>1.07</td>
<td>3.13</td>
<td>10</td>
<td>Yes</td>
<td>F001, F002</td>
</tr>
<tr>
<td>Acetone</td>
<td>36</td>
<td>24</td>
<td>74.3</td>
<td>26.3</td>
<td>15.9</td>
<td>29.7</td>
<td>100</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Butanol</td>
<td>36</td>
<td>9</td>
<td>141.8</td>
<td>22.1</td>
<td>31.2</td>
<td>28.9</td>
<td>100</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Methanol</td>
<td>36</td>
<td>1</td>
<td>55.8</td>
<td>5.4</td>
<td>9.3</td>
<td>7.37</td>
<td>100</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Methyl ethyl ketone</td>
<td>36</td>
<td>1</td>
<td>110</td>
<td>13.1</td>
<td>16.4</td>
<td>16.7</td>
<td>100</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Methyl isobutyl ketone</td>
<td>36</td>
<td>0</td>
<td>35.7</td>
<td>27.8</td>
<td>—</td>
<td>—</td>
<td>100</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

*These compounds are from the TRAMPAC and are flammable VOCs that do not appear in the QAPP or the WIWW WAP. These are not part of the target analysis list, but samples may be analyzed for these compounds.

*These xylene isomers cannot be resolved by the analytical methods employed in the program. M-xylene and p-xylene will be reported as "Total m-p-Xylene."

*Required only for homogenous solids and soil/gravel waste from Los Alamos National Laboratory and Savannah River Site.

*Required only for homogenous solids and soil/gravel waste from Oak Ridge National Laboratory and Savannah River Site.

**Completed By:**

Adela M. Cantu

**Date:** 9/10/02
### Attachment 3 Table 2 - Headspace Gas Summary Data

<table>
<thead>
<tr>
<th>Tentatively Identified Compound</th>
<th>Maximum Observed Estimated Concentrations (ppmv)</th>
<th># Samples Containing TIC</th>
<th>% Detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Methyl, 2-propanol</td>
<td>257</td>
<td>8</td>
<td>22.2%</td>
</tr>
<tr>
<td>cyclohexanone</td>
<td>51.4</td>
<td>1</td>
<td>2.8%</td>
</tr>
</tbody>
</table>

Data confirms Acceptable Knowledge? Yes [x] No

If no, describe the basis for assigning the EPA Hazardous Waste Codes:

SPM Signature: Adela M. Cantu  
Date: 8/24/02
Attachment 3 Table 6 - RTR/TE Summary of Prohibited Items and AK Confirmation

WSPF# SR-W027-FB-Pre66-C REVISION 1 10/28/02 Waste Stream Lot Number 1

<table>
<thead>
<tr>
<th>Container Number</th>
<th>RTR Prohibited Items*</th>
<th>Visual Examination Prohibited Items*</th>
<th>AK Confirmation*</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA-No prohibited items identified in this batch.</td>
<td>Rest of form is intentionally left blank.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. See Batch Data Reports  
b. Attachment 10 of CCP-TP-005, CCP Acceptable Knowledge Documentation

Adela M. Cantu  
Site Project Manager Signature  
Printed Name  
Date

Effective Date: 06/19/2002  
Page 37 of 37
Attachment 1B - Reconciliation with Data Quality Objectives

SPQAQ Sampling Completeness

RTR:
Number of valid samples: 36  Number of total samples analyzed: 36
Percent Complete: 100% (QAO is >90%)

NDA:
Number of valid samples: 36  Number of total samples analyzed: 36
Percent Complete: 100% (QAO is >90%)

HSG:
Number of valid samples: 36  Number of total samples collected: 36
Percent Complete: 100% (QAO is >90%)
Number of valid samples: 36  Number of total samples analyzed: 36
Percent Complete: 100% (QAO is >90%)

SPQAQ Signature and Date: [Signature] A.J. Fisher 8/27/02

I certify that sufficient data have been collected to determine the following Program-required waste parameters:

WSPF# SR-W027-FB-Pre86-C REVISION 1 Lot# 1

<table>
<thead>
<tr>
<th>YN/NA</th>
<th>Reconciliation Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>Y</td>
</tr>
<tr>
<td>4.</td>
<td>Y</td>
</tr>
<tr>
<td>5.</td>
<td>Y</td>
</tr>
<tr>
<td>6.</td>
<td>Y</td>
</tr>
</tbody>
</table>
**Attachment 1B - Reconciliation with Data Quality Objectives (continued)**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Mean concentrations, UCL$_{90}$ values for the mean concentration, standard deviations, and the number of samples collected for total VOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary Table 3, and additional EPA Hazardous Waste codes were assigned as required. Samples were randomly collected.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean concentrations, upper 90% confidence limit (UCL$_{90}$) values for the mean concentration, standard deviations, and the number of samples collected for total SVOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary Table 4, and additional EPA Hazardous Waste codes were assigned as required. Samples were randomly collected.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean concentrations, upper 90% confidence limit (UCL$_{90}$) values for the mean concentration, standard deviations, and the number of samples collected for total metals were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary Table 5, and additional EPA hazardous Waste codes were assigned as required. Samples were randomly collected.</td>
</tr>
<tr>
<td>8.</td>
<td>Y</td>
<td>The data demonstrates whether the waste stream exhibits a toxicity characteristic under 40 CFR 261, Subpart C.</td>
</tr>
<tr>
<td>9.</td>
<td>Y</td>
<td>Waste stream can be classified as hazardous or nonhazardous at the 90-percent confidence level.</td>
</tr>
<tr>
<td>10.</td>
<td>Y$^2$</td>
<td>Sufficient number of waste containers have been visually examined to determine the UCL$_{90}$ for the miscertification rate is less than 14%.</td>
</tr>
<tr>
<td>11.</td>
<td>Y</td>
<td>TICs were appropriately identified and reported in accordance with the requirements of Section B3-1 of the OAPjp.</td>
</tr>
<tr>
<td>12.</td>
<td>Y</td>
<td>The PROQLs for headspace gas VOCs, were met for all analyses as evidenced by the analytical batch data reports.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Completeness</th>
<th>Comparability</th>
<th>Representativeness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiography</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Headspace Gas Sampling and Analysis</td>
<td>NA$^{**}$</td>
<td>NA$^{**}$</td>
<td>NA$^{**}$</td>
</tr>
</tbody>
</table>
### Attachment 1B - Reconciliation with Data Quality Objectives (continued)

<table>
<thead>
<tr>
<th></th>
<th>Headspace Gas Analysis</th>
<th>Y</th>
<th>Y</th>
<th>Y</th>
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</thead>
<tbody>
<tr>
<td>13.</td>
<td>Solids Sampling</td>
<td>NA*</td>
<td>NA*</td>
<td>NA*</td>
</tr>
<tr>
<td></td>
<td>Total VOCs</td>
<td>NA*</td>
<td>NA*</td>
<td>NA*</td>
</tr>
<tr>
<td></td>
<td>Total SVOCs</td>
<td>NA*</td>
<td>NA*</td>
<td>NA*</td>
</tr>
<tr>
<td></td>
<td>Total Metals</td>
<td>NA*</td>
<td>NA*</td>
<td>NA*</td>
</tr>
</tbody>
</table>

1. No additional EPA Hazardous Waste Codes assigned
2. Miscertification rate determined to be 6% from Lot 1
   * Not analyzing homogenous waste
   ** On line sampling system.

[Signature]

Adela M. Cantu
Signature of Site Project Manager

Adela M. Cantu
Printed Name

8/27/02
Date