0054824

Meeting Minutes Transmittal

PFP Project Managers Meeting
Federal Building/Room 249

Richland, Washington

February 14, 2001
9:00 a.m. to 10:00 a.m.

The undersigned indicate by their signatures that these meeting minutes reflect the actual occurrences of the above dated Project Managers Meeting.

M. R. Hahn, PFP Project Manager, DOE-RL — Date: 3/21/01

J. K. Yerxa, TPA Project Manager, DOE-RL — Date: 3-21-01

F. W. Bond, Project Manager, Washington State Department of Ecology — Date: 3-21-01

PFP, FH Concurrence:

L. R. Fitch, Contractor Representative, FH — Date: 3/21/01

Purpose: Project Managers Meeting

Attachment 1: Agenda
Attachment 2: Meeting Minutes
Attachment 3: Attendee List
Attachment 4: Current PFP Status
Attachment 5: Waste Designation for Hanford Ash
Attachment 6: April 18, 2000 Meeting Minutes
Attachment 7: February 14, 2001 RCRA/AEA Presentation/Meeting Minutes

Attachment 1

PFP Project Managers Meeting Agenda
Federal Building/Room 249
Richland, Washington

February 14, 2001
9:00 a.m. to 10:00 a.m.

1. Administrative Issues
   a. Approval of the January Meeting Minutes
   b. April 18, 2000 PFP TPA/RCRA Issues Meeting Minutes Approval – Rick Bond

2. PFP Project Item Status
   a. PFP Project Overview Status – Larry Fitch
   b. Hanford Ash Repackaging TPA Negotiations Status - Jon Yerxa
   c. Hanford Ash Characterization – Andrea Hopkins
   d. Tank Z 361 BCR/TPA Status – Keith Hampton

3. Conduct Technical Negotiation Discussions (TNDs)
   a. Project Baseline/DNFSB [complete 9/26]
   b. PFP Tour (scheduled 10/18) [complete]
   c. IPMP Detailed Overview (scheduled 10/19) [complete]
   d. Residues Overview-Hanford Ash (scheduled 10/25) [complete]
   e. WIPP Interface (scheduled 11/16) [complete]
   f. TPA Section 8 Overview (scheduled 11/30) [complete]
   g. Hanford Ash Characterization/Designation (scheduled 12/19) [complete]
   h. WIPP Interface (scheduled 1/3) [complete]
   i. Pu alloys (scheduled 1/17) [complete]
   j. AEA/RCRA Storage Issue (scheduled 2/14)
   k. IPMP Transition Planning (scheduled 3/21)
   l. Waste versus Material discussion (TBD)
   m. Tank 241 (June)
   n. Introduction to Vessel Inventory planning (June)

4. New Topics

5. Next meeting is March 21, Federal Building, Room 249, 9:00 a.m.-11:00 a.m.

Attachment 2
Summary of Discussion and Commitments/Agreements

PFP Project Managers Meeting
Federal Building/Room 249
Richland, Washington

February 14, 2001
9:00 a.m. to 10:00 a.m.

ADMINISTRATIVE ISSUES

January meeting minutes were approved.

The meeting minutes from April 18, 2000, continue to be under review and awaiting a meeting with Ecology to discuss and gain approval. To date both agencies (RL and Ecology) have been unable to agree on the intent of the meeting minutes. Rob Piippo proposed recording the minutes as an attachment to the February 14, 2001 project managers meeting minutes and then close the item. Rick Bond said he would like to carry this issue to the next meeting.

Jon Yerxa suggested to the group that Rick Bond needs to have a "Q" Clearance. Most of the group thinks an "L" clearance would be sufficient. Mark Hahn took an action to investigate which clearance will be appropriate and also to get Rick a written justification as to why he needs a clearance.

PFP PROJECT OVERVIEW STATUS - Larry Fitch

Larry Fitch gave a brief presentation on the status of PFP. The safety performance at PFP is going well except for more first aid cases appearing. They are working on fixing the problem. Currently, PFP has two shifts working to get the residues packaged by the end of March. They have about 70% of the job completed. Thermal stabilization is scheduled to complete in 2004. Currently, ~~821~~ total stabilized out of approximately 6000. Solutions stabilization is scheduled to complete by the end of December 2001. Currently, 392 liters stabilized out of approximately 4200. The Bagless Transfer System in FY 2001, 122 BTC welded.

HANFORD ASH REPACKAGING TPA NEGOTIATIONS STATUS – Jon Yerxa

The TPA Change Request is in the final stages. It is currently going through approval process. Will get Rick a new draft copy following the PMM with waste codes but not a due date.

HANFORD ASH CHARACTERIZATION – Andrea Hopkins

The paper supporting designation for Hanford Ash was provided at the meeting (see attachment to file). The designation packaged is prepared by FH and is available to Ecology on request.

TANK Z 361 BCR/TPA STATUS – Keith Hampton

No change. Report is being developed on schedule and work is continuing on planning.

NEW TOPIC

IPMP Transition Planning: Mark Hahn explained that a project planning war room has been established at 2355 Stevens and PFP is in the process of scheduling the facility activities out several years. Mark offered to take Ecology through the war room to show Ecology the effort that has been performed to date, and learn about the process that the PFP staff are going through to get a baseline by the end of this June. Mark took an action to set up a meeting with Ecology to tour the war room.

Glovebox HA-20MB: The glovebox is currently permitted as a RCRA treatment unit, but inasmuch as the cementation process has been deferred, the facility is evaluating alternative non-RCRA uses of the glovebax to improve the efficiency of stabilization activities. The existing cementation equipment and SS&C containers would be removed prior to such use to ensure no cross-contamination occurred. Prior to initiating the cementation process, the glovebox would be emptied of the non-RCRA material. Proposals to date include 1) staging filtrate from the magnesium hydroxide precipitation process (not waste) in the glovebox as lag storage awaiting readiness of the muffle furnaces and 2) installing hot plates in the glovebox. Would like to get Ecology's agreement that no RCRA-related approvals are required to use the glovebox for non-RCRA purposes. Ecology has asked for a writeup of the process when more fully developed.

Attachment 3
Attendance List

Meeting Title: PFP Project Managers Meeting

Date: February 14, 2001

Original included in hard copy.

Name	Company	Phone Number
Roger C. Bowman	FH	376-4876
Andrea M. Hopkins	FH	373-5395
Rob E. Piippo	FH	373-3285
Larry Fitch	FH	376-7536
Karl Hadley	FH	372-2852
Sheri Stolle	FH	376-7037
Julie Robertson	FH	376-8162
Oliver S. Wang	Ecology	736-3040
Laura Ruud *	Ecology	736-5715
Bob Wilson *	Ecology	736-3031
Rick Bond	Ecology	736-3007
Jon K. Yerxa	DOE-RL	376-9628
Astrid Larsen	DOE-RL	372-0477
Mark Hahn	DOE-RL	373-9872
Briant Charboneau	DOE-RL	373-6137
Larry Oates	EQM	946-4985

- Attended RCRA/AEA Presentation

Attachment 4
Current PFP Status

Meeting Title: PFP Project Managers Meeting

Date: February 14, 2001

Current PFP Status

L. R. Fitch

Feb.14,2000

Safety Performance

- Last "lost time injury" occurred 12/03/99
- PFP has exceeded 1,400,000 hrs. w/o LTI

Residues

- 234 Kg. of RF ash repackaged
- 205 Kg. this fiscal year
- 185 Pipe Overpack Containers Packed
- 107 POCs Shipped to CWC

Thermal Stabilization

Fy'99– 150 items stabilized

Fy'00– 585 items

Fy'01– 146 items

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881 total (of ~6000)

ODOE 2004

Solutions Stabilization

- Fy'00– 103 liters
- Fy'01--289 liters

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392 total (~4200)

12/2001

COMPLETED

Bagless Transfer System

- Fy'00– 1 BTC welded
- Fy'01– 122 BTC welded

- W-460 project
- Outercan welder startup– May '01 (ZB)
- Vault mods– May'01

WHAT IS W-460 OUTER PROCESS LINE

Attachment 5: Waste Designation for Hanford Ash

Meeting Title: PFP Project Managers Meeting

Date: February 14, 2001

1.0 SUMMARY

This paper provides information to support the dangerous waste designation for ash waste generated by an incinerator at the 232-Z Contaminated Waste Recovery Facility (CWRF) near the Plutonium Finishing Plant (PFP) at the Hanford Site. This designation is derived from the relevant hazardous waste regulations and knowledge of the waste generation and handling practices that have been employed for Hanford Ash waste over the last 40 years. Fluor Hanford has reviewed the available information for the activities that contributed to the incineration feed and bases this designation on that process knowledge. This approach is consistent with directives from the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE)-Carlsbad Operations, to avoid sampling when process data are sufficient to designate materials that have as low as reasonably achievable (ALARA) concerns due to radionuclide content (EPA 1997a and DOE 1998).

Process knowledge and procedures illustrate that the feed to the incinerator was carefully monitored. This information indicates that the waste should designate under the *Washington Administrative Code* (WAC) 173-303 for the presence of toxicity characteristic (TC) metals. Limited analyses show the presence of cadmium, chromium, and lead in slag from the 232-Z incinerator. In addition, a solitary sample of ash, believed to be from the CWRF, indicates the presence of barium oxide and chromium oxide. Although these analyses were not performed to support waste designation, they provide an indication of the likely make up of the waste. Samples from similar ash generated at the Rocky Flats Plant support a waste designation for these same metals. Those analyses showed a variety of TC metals present in the ash, including barium, chromium, and lead. The packaged ash contains an average of 10% and a range of between 4% and 28% plutonium by weight (PFP 1995). Fluor Hanford, therefore, is designating the ash based on the high likelihood of certain TC metals being present rather than analyzing to confirm their presence.

The waste history and management practices for the ash indicate that it would not designate as reactive or ignitable under the characteristic waste requirements established in the Federal *Resource Conservation and Recovery Act of 1976* (RCRA) regulations at 40 *Code of Federal Regulations* (CFR) 261.21 and .23. Although the waste would not designate as corrosive under the Federal program (40 CFR 261.22), the waste is assigned a State-only hazardous waste number for corrosivity under the more inclusive Washington State Dangerous Waste Regulations (WAC 173-303-090(6)).

Hanford Ash was generated from processes and in a combustion chamber similar to the recovery process used at the Rocky Flats Plant. Available knowledge indicates, however, that there were more stringent controls on the process and feed materials at the Hanford Site than at the Rocky Flats Plant. Volatile organic materials that were identified in the Rocky Flats Ash can be connected to the differences in feed materials and subsequent handling practices and should not be present in the Hanford Ash.

Hanford Ash will be repackaged and shipped to the Central Waste Complex (CWC) for future disposition at the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico.

BACKGROUND

The 232-Z CWRF was the source of Hanford Ash that is currently stored in the PFP. Although the CWRF was constructed primarily to recover plutonium from glovebox debris generated in the nearby 234-5Z and 231-Z buildings, the facility did receive and process materials from other locations on site. The 232-Z incinerator, which generated the ash, was one of two treatment processes located in the 232-Z CWRF and operated between January 1962 and mid-1973. The facility was neither designed nor intended to dispose of materials from process operations.

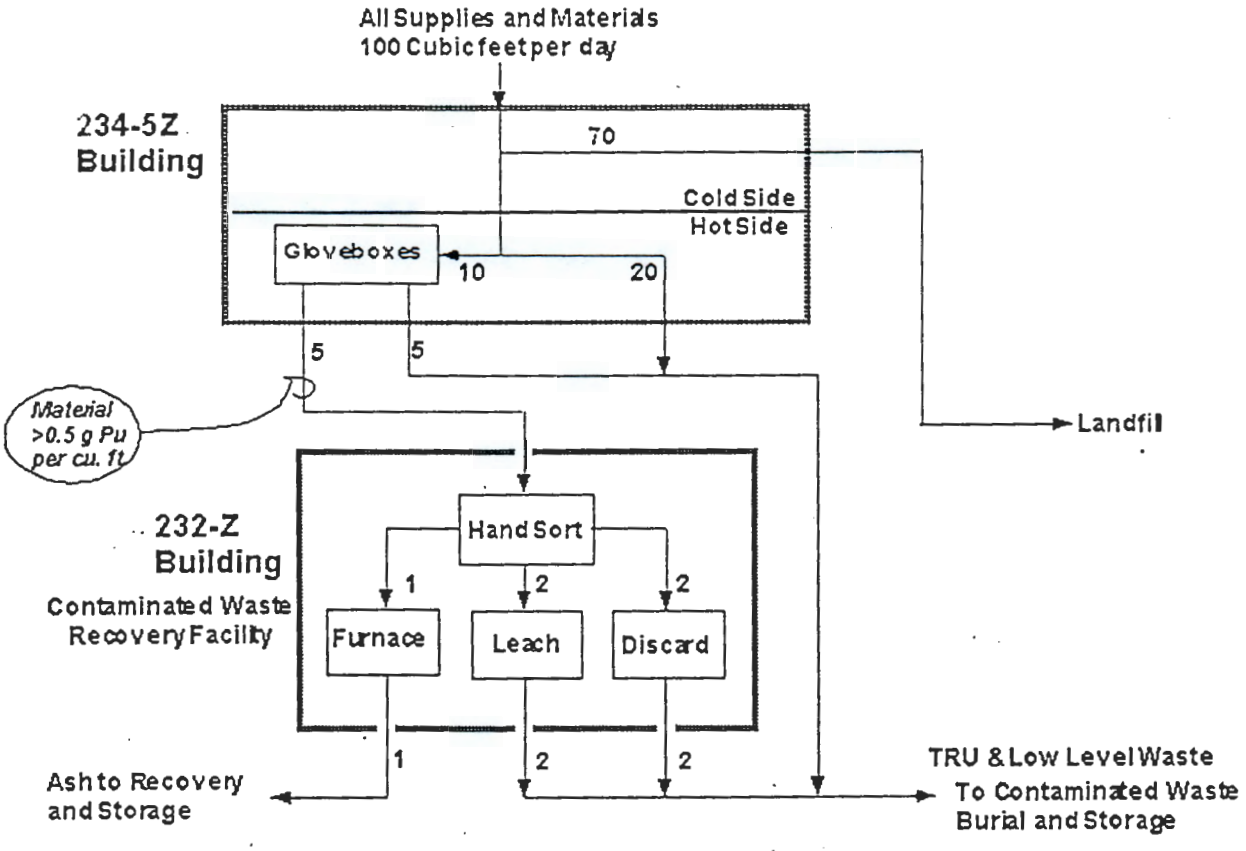
Materials received at CWRF were sorted manually in a glovebox for discard, or plutonium recovery through leaching or incineration. Each package that was introduced to the CWRF was inspected to evaluate the item for the presence of recoverable amounts of plutonium. The recovery processes (leaching and incineration) at the CWRF were reserved for those items with plutonium concentrations that met specific criteria; items that did not have recoverable amounts were discarded for disposal via other pathways. Materials to be incinerated were fed batch-wise into a high-speed mechanical chopper for reduction into a size suitable for furnace feed. Metal items were not acceptable because they ruined the chopper blades and jammed the furnace conveyor. Because high volumes of plastics would cause problems with the furnace, these items also were avoided when possible. Only a small portion of the total volume of material that was sent to the CWRF was fed to the 232-Z incinerator. Figure 1 illustrates the reduction in waste volume as it was sorted at the CWRF. The care that was taken to minimize the waste that was sent to the 232-Z incinerator, as reflected in this volume reduction, supports the position that the feed was closely controlled.

The 232-Z incinerator burned combustible residues from plutonium processing and recovery operations to reduce the volume of the material, to remove any volatile constituents, and to produce an ash from which plutonium could be recovered. The incinerator was a dual-chambered, externally heated, muffle-type furnace fed by a continuously moving wire mesh belt that carried chopped feed material into and through the primary combustion chamber. Feed was sent through a chopper into a bin, which discharged the material onto a rubber belt and, from there, to the continuous wire mesh conveyor and into the furnace. Ash was collected in a one-quart capacity steel food-pack type can, packaged out after cooling, and stored for future reclamation of plutonium.

The design and operation of the furnace controlled the inputs to the process, as well as the destruction of feed materials. A mechanical chopper reduced incoming material to a consistently small size to facilitate the combustion process. The size of the conveyor passages required this feed size reduction, which also facilitated incineration control. Automatic instrumentation regulated the furnace throughout its lifetime.

The temperature in the primary combustion chamber was automatically controlled in the range of 700 °C to 800°C. As burning feed material added heat to the furnace, the heating elements would cycle on/off at the upper temperature set point (800°C). The electrical elements also had a preset minimum temperature control, allowing the incinerator to idle at 650°C to 675°C when feed was not being processed (PFP 1973). Higher temperatures caused the furnace materials to fail. The belt speed was 12 to 15 inches per minute with an 8 to 10 minute residence time in the furnace.

Figure 1. Reduction in Feed Volume through Sorting at CWRF



Note: supply material includes such things as: paper, plastic, rags, rubber gloves, tape, wood, cardboard cartons, glassware, ice cream cartons, brushes, cans, etc.

The selection of materials that were introduced to the furnace was controlled by administrative and procedural limits. Because the furnace was subject to numerous operational difficulties, there was an incentive to avoid firing unnecessary or unusual materials. Typical feed to the furnace included rags, paper, plastic, glove tips, cardboard, and wood. Most of the plastic introduced to the CWRF was not sent to the incinerator furnace because of the large amount of soot formed in burning and the resulting corrosion from chloride release. Nonetheless, significant quantities of plastic were incinerated along with the cut-off tips of rubber gloves. In fact, plastic (primarily polyvinyl chloride along with polyethylene and polypropylene) was a significant component of the waste feed. When plastic was burned, additional cardboard was added to achieve a 50-50 plastic–cardboard mix to support combustion of these and other hard-to-burn materials (Panesko 1971a and 1975).

Atypical materials, such as graphite, hood sludge, asbestos, and fabrication oil, were infrequently introduced to the incinerator. These atypical feed materials also would have been selected for the incinerator because of the presence of economically recoverable quantities of plutonium. Some of the ash cans were generated during periods when these atypical feed materials were burned, so it is possible that these cans of ash contain byproducts from the incineration of atypical feed. Hood sludge generally consisted of material such as dissolved rubber gloves, nitric acid, plutonium nitrate, plutonium oxide particles, carbon tetrachloride, and equipment corrosion products such as nickel, iron, aluminum, and chromium (Bruns 1962 and Unzicker 1963). The information that was reviewed to evaluate sources of feed material indicates, for example, that 250 mL of sludge from the facility for recovery of uranium and plutonium by extraction (RECUPLEX) solvent extraction hood floor was mixed with sawdust and burned in March of 1962; additional floor sludge was burned in 1964. On another occasion, the records indicate that 97 one-liter cans of air-dried sludge from the RECUPLEX reception and blending hood was burned. This information does not provide a basis to believe that this sludge contained carbon tetrachloride used in a process that would require designation as an F-coded waste. There are no other data to suggest that the feed materials to the incinerator would have contained solvents or degreasers that would require assigning an F-code to the Hanford Ash. Information generated for the designation of Rocky Flats Ash did indicate that feed materials would have contained F-listed materials. Information reviewed and process knowledge of the 232-Z incinerator operations does not provide a basis for believing that similar materials were included in this feed.

Process oil absorbed onto paper towels also was incinerated. Lard oil was the cutting oil of choice for machining plutonium. The McGraw-Hill Dictionary of Scientific and Technical Terms, fourth edition, defines lard oil as follows:

> Lard Oil [MATER] Yellowish to colorless oil with characteristic aroma and bland taste; melts at 2°C; soluble in carbon disulfide, ether, benzene and chloroform; main components are olein and glycosides of solid fatty acids; used as a lubricant, wool oil, and in soap manufacture.

Lard oil for processes at PFP typically was diluted with carbon tetrachloride and referred to as "Fab Oil." Because the carbon tetrachloride was added to the lard oil as a thinning agent and was not used as a solvent or degreaser, there is no reason to assign an F-code to the Fab Oil or

the resulting ash. Used Fab Oil was stored in five-gallon metal cans pending a process for salvaging the plutonium. Most of the material was processed chemically, but approximately 250 gallons of this oil were burned in the incinerator between 1971 and 1973 (Crawley 1975). A literature review indicated that the temperature and residence time in the 232-Z incinerator would destroy the Fab Oil constituents. A summary of the incinerator operation is available in Gerber (1997) and DOE (1997).

Ash from the incinerator was collected and packaged for plutonium recovery; less than 9% of this material remains in storage at PFP. The Hanford Ash inventory consists of approximately 123 items, including 14 seven-inch cans of ash and 109 lard cans. The lard cans contain approximately 498 inner seven-inch cans, resulting in a total inventory of some 512 individual cans of Hanford Ash. The bulk of the ash remaining in inventory was produced during two major time periods, between mid-1964 and mid-1965 and between 1968 and 1969. These timeframes do not include the period (1971) when some of the feed included asbestos.

The Nuclear Material Item Transfer (NMIT) records identify the number of inner cans of ash contained within the lard cans, and the can identification (ID) numbers. Container ID numbers are coded in a way such that the date of ash packaging can be determined. Packaging was coincident with ash generation; thus, the ID numbers allow a determination of the generation date. Based on this information, only a small amount of the ash that is in the PFP inventory was generated during the 1962-1964 time period when atypical feeds were processed. Likewise, only a small amount of the inventory was generated during the 1972-1973 time period when Fab Oil was incinerated. The packaging records indicate that the following numbers of cans were generated during those periods when atypical feed was being incinerated:

- seven cans were generated during the interval when sludge was incinerated;
- sixteen cans were generated during the period when polyethylene sock filters were burned;
- five cans were generated during the period when graphite was in the feed; and
- twenty-four cans were generated during the period when Fab Oil was in the feed.

This information does not confirm the presence of the byproducts from these materials in the respective cans, but indicates the potential for these feed materials to have contributed to those cans.

Because the primary constituent of interest was the plutonium content, analytical data were not generated to characterize the Hanford Ash for regulatory purposes. Analyses were conducted only to support process needs. The results from one analysis for "Can #85" are provided in Table 1. These data were retrieved from the 232-Z incinerator files, although the original reference document could not be located. The data indicate the presence of barium oxide and chromium oxide, as well as "volatile material" at 28 weight percent. Based on the likely purpose of the analyses that were conducted for the ash (i.e., assessment of the efficiency of the incineration process), it is likely that the analysis performed was a "Loss on Ignition" (LOI) test. Taken in this context, the term "volatile material" would refer to the percentage of material that was lost through incineration. Although there is no additional information to support this conclusion, there is no reason to believe that the investigators would have been interested in evaluating volatile material in the RCRA context. In addition, such a large percentage of volatile

materials (in the RCRA sense) would not remain after incineration at the temperatures experienced in the 232-Z incinerator.

Table 1. Analysis of Ash from Can #85

Constituent	Ash (Wt. %)
Barium oxide	0.67
Calcium oxide	0.17
Chromium oxide	0.44
Chloride	0.24
Iron oxide	10.01
Manganese oxide	0.09
Nickel oxide	0.10
Plutonium oxide	17.53
Silicon oxide	11.98
Zinc oxide	0.12
Carbon	28.0
Total	69.35
% volatile material	28

Results are from an unknown reference; table found in PFP technical files on the 232-Z incinerator. It is clear from the records, however, that this information was not generated to support characterization for purposes of a regulatory designation.

During incinerator operations, ash material in the form of slag would occasionally plug the updraft tubes between the primary combustion chamber and the secondary combustion chamber for the off-gas. Results of inorganic analyses from four samples of this Hanford Ash slag indicate 2 to 4 wt% aluminum and calcium, 1 to 2 wt% iron, nickel, lead, and zinc, 1.5 to 10 wt% silicon, and 1 wt% chromium (Schuelein 1973). The slag was generated over a several month period and would contain materials that were both particulate from the ash and materials that otherwise had volatilized and recondensed. The slag, therefore, presents a conservative illustration of the constituents that are present in the ash. Selected results from these analyses are provided in Table 2; samples were predominately either black or green in color, thus the "black" and "green" descriptors.

Table 2. Analysis of Incinerator Slag

Element	Emission Spec Leachate (maximum) (ppm)		Emission Spec Ground Solid (maximum) (ppm)	
	Green	Black	Green	Black
Aluminum	1,500	20,000	40,000	40,000
Calcium	1,000	1,000	40,000	40,000
Cadmium	50	1,000	2,000	300
Chromium	1,000	1,000	10,000	10,000
Iron	200	2,000	20,000	20,000
Lead	>2,000	>2,000	>20,000	>20,000
Nickel	2,000	20,000	20,000	20,000
Silicon	100	1,000	100,000	15,000
Zinc	>2,000	>2,000	20,000	20,000

Source: Schuelein (1973)

The planned disposition pathway for the Hanford Ash involves blending, as necessary, to achieve acceptable plutonium loading, packaging into pipe component containers, and shipment to WIPP.

2.0 HANFORD ASH WASTE DESIGNATION

The discussion that follows addresses the regulatory conclusions derived from available information for the Hanford Ash.

2.1 TOXICITY CHARACTERISTICS

As noted above, there are few analytical data to support a designation of the Hanford Ash. Conclusions regarding the appropriateness of a designation for TC were made based on the available data and process knowledge.

2.1.1 Toxicity Characteristic Metals

Based on a limited metal analysis of Hanford Ash and slag, the ash is considered likely to contain constituents that are regulated as toxic metals under the TC rule per WAC 173-303-090(8) (i.e., barium, cadmium, chromium, and lead). As noted above, the limited analyses of ash and slag indicate the presence of these constituents, although not all at levels that would cause them to be designated as hazardous. Although these analyses were not performed to support a regulatory determination, ash from the Rocky Flats Plant that was characterized to support designation showed the presence of TC metals at levels that required assignment of the TC codes

for these metals. It is reasonable to assume that those metals found in the ash and slag (barium, cadmium, chromium, and lead) are also present above regulated concentrations in the Hanford Ash. Rocky Flats Ash also was designated for arsenic, mercury, and selenium, based on process history, not analytical results. There is no information in the process history for the Hanford Ash to suggest that feed containing these metals was ever fed to the incinerator; therefore, these codes are not being assigned to the Hanford Ash. Because of the high potential for the presence of barium, cadmium, chromium, and lead in the Hanford Ash, as well as the ALARA concerns associated with sampling and analysis of the ash, Fluor Hanford is assigning the TC codes for these metals to the ash.

2.1.2 Volatile and Semi-volatile Organic Compound Analysis

The feed material for the CWRF and the incinerator specifically is known to have contained plastics. As noted above, the volume and types of plastics were limited in order to reduce problems with the incinerator operations. Much of the plutonium present on plastic materials was removed through alternative methods. Nonetheless, at times the feed to the incinerator did consist of up to 50% plastics, primarily polyvinyl chloride (PVC), along with polyethylene and polypropylene (Panesko 1971a and b).

Feed material to the incinerator was reduced in size in order to optimize the combustion process. Process documents for the incinerator indicate that the temperatures achieved in the incinerator were sufficient to destroy the plastics. This conclusion is supported by a review of the destruction temperatures for plastics in the literature (see, e.g., NTIS 1973). The NTIS document indicates that PVC, polyethylene, and polypropylene are all destroyed by combustion at temperatures below 625°C. PVC is completely destroyed at approximately 600°C, while polyethylene and polypropylene are completely combusted at temperatures in the range of 500 °C to 550°C and 440°C, respectively. Figures 2, 3, and 4 illustrate the destruction curves for these plastics.

In addition, the potential byproduct compounds from these plastics all would be volatilized at the temperature range specified for operation of the incinerator. Table 3 illustrates the various compounds that would be generated by the breakdown of the plastics, along with their flash point temperature. At the flash points for each of these constituents, the materials would have volatilized and been carried off in the vapor removal system of the incinerator. This information indicates that the plastics and their byproducts would have been destroyed or removed through the incineration process.

As noted above, process knowledge does not indicate a basis for assigning an F-code to any of the feed materials or the resulting ash. The materials reviewed also do not indicate any reason to believe that polychlorinated biphenyls (PCBs) would have been contained in any of the feed materials. Some of the fabrication lines in the 234-Z Building used fire-resistant hydraulic fluids, at least one of which contained PCBs. Even if this material were to become contaminated, it would not have been used as incinerator feed because the plutonium content would not have been high enough to merit an attempt at recovery. Based on these considerations, it was determined that Hanford Ash will not be designated with the toxicity characteristic for organics.

Table 3. Constituents Generated During Incineration of Plastics

Constituent[a]	PVC	Poly-ethylene	Poly-propylene	CAS #	Flash Point (°C)[b]
Methane	X	X	X	74-82-8	-187.7
Ethylene	X	X	X	74-85-1	-136
Ethane	X	X	X	74-84-0	-135
Propylene	X	X	X	115-07-1	-108
Propane	X	X	X	74-98-6	-
Vinyl Chloride	X			75-01-4	42
1-Butene	X	X	X	106-98-9	-
Butane	X	X	X	106-97-8	-
trans-2-butene		X	X	624-64-6	-
cis-2-butene		X	X	590-18-1	-
Isopentane	X			78-78-4	-51
1-Pentene	X	X	X	109-67-1	-28
Pentane	X	X	X	109-66-0	-49
1,3-Pentadiene		X	X	504-60-9	-28
Cyclopentene	X			142-29-0	-30
Cyclopentane	X			287-92-3	-37
1-Hexene		X	X	592-41-6	-26
Hexane	X			110-54-3	-22
2-Hexene		X		592-43-8	-20
Methylcyclopentane	X			96-37-7	-10
Benzene	X			71-43-2	-11
Toluene	X			108-88-3	4

[a] By-product constituent information from NTIS (1973).

[b] Flash points taken from Chemfinder.com; http://chemfinder.camsoft.com/

Figure 2. Thermographic Analysis of Polyvinyl Chloride Heated at 10°C/min. in Air (from NTIS 1973)

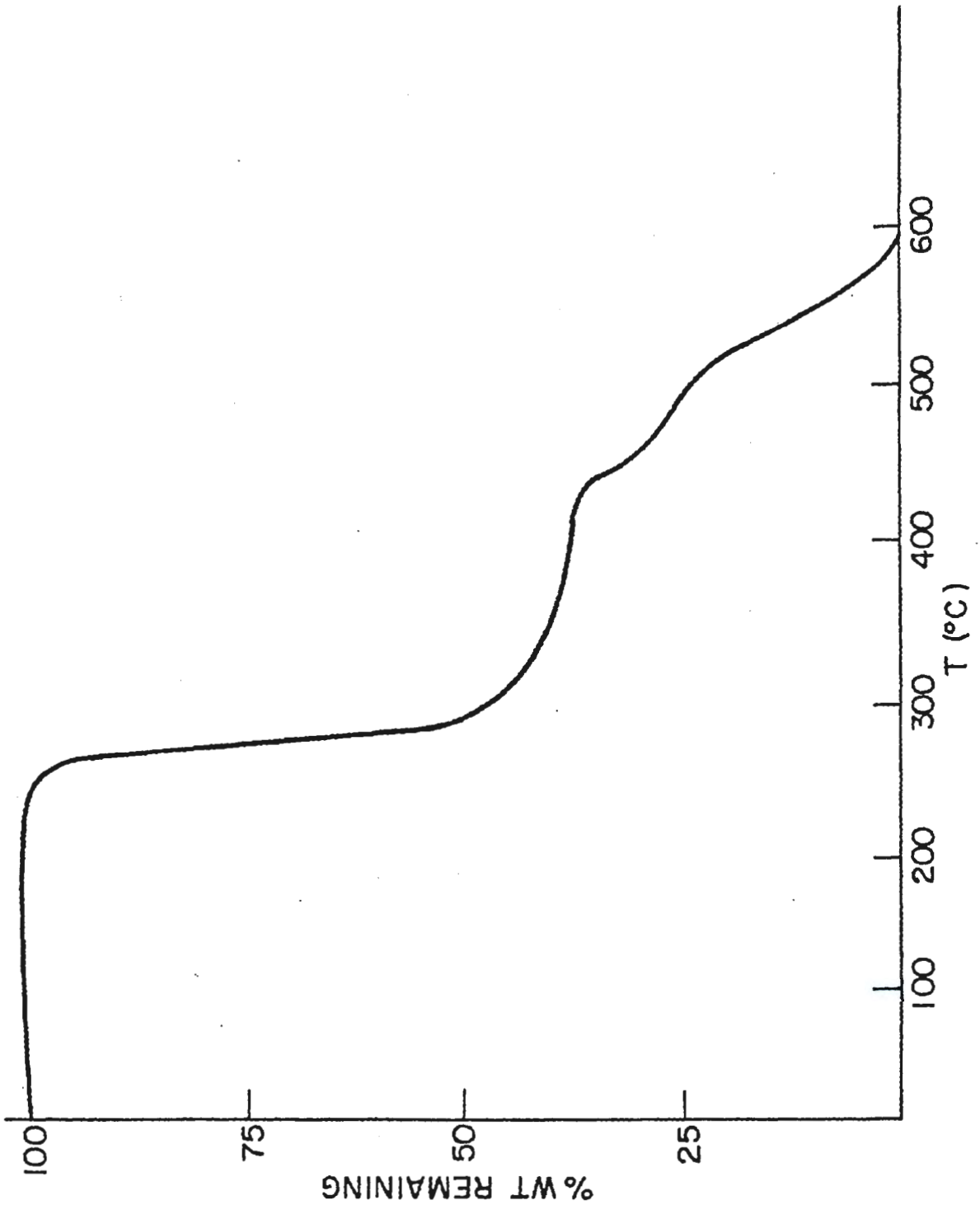


Figure 3. Thermographic Analysis of Isostatic Polypropylene Heated at 3°C/min. in Air (from NTIS 1973)

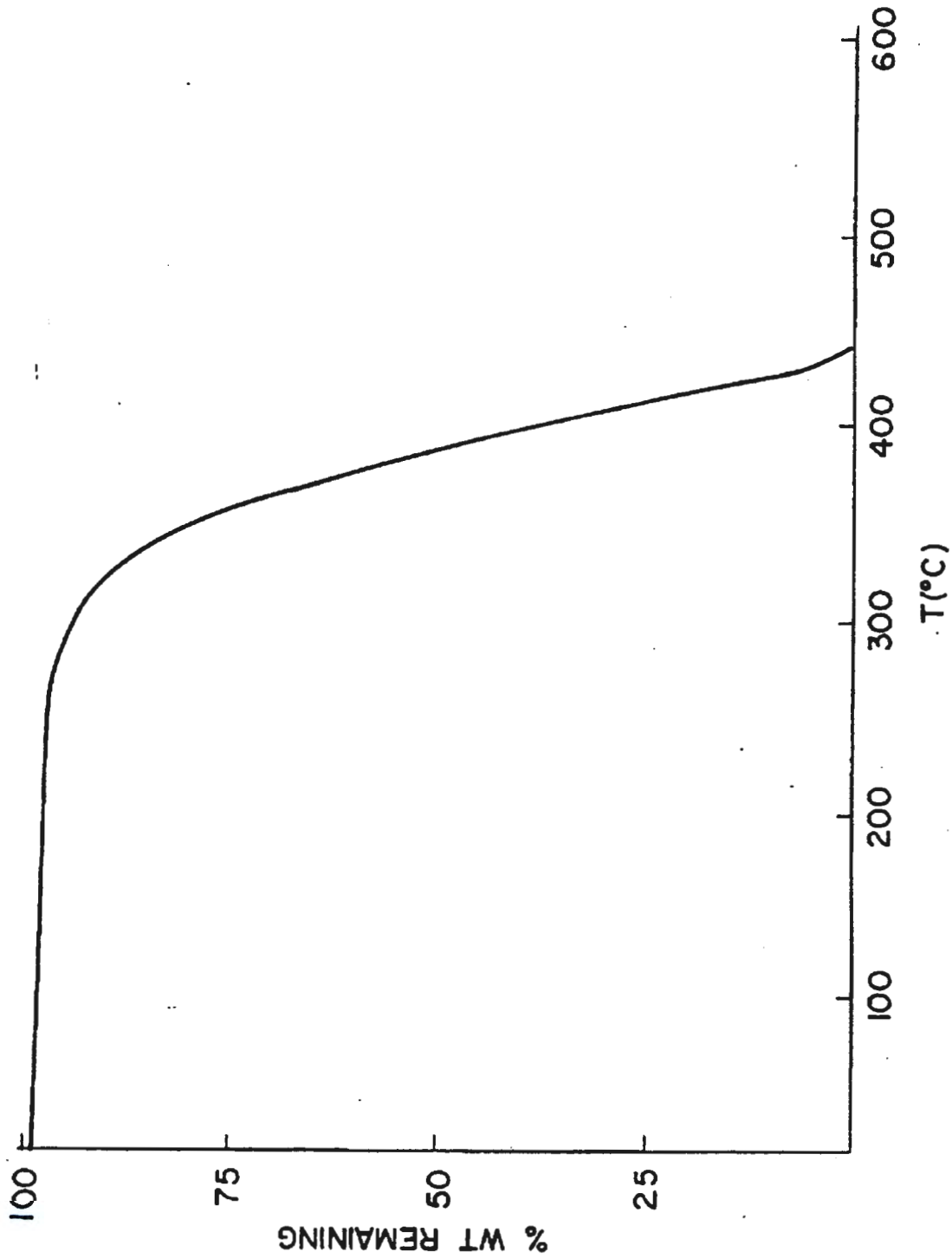
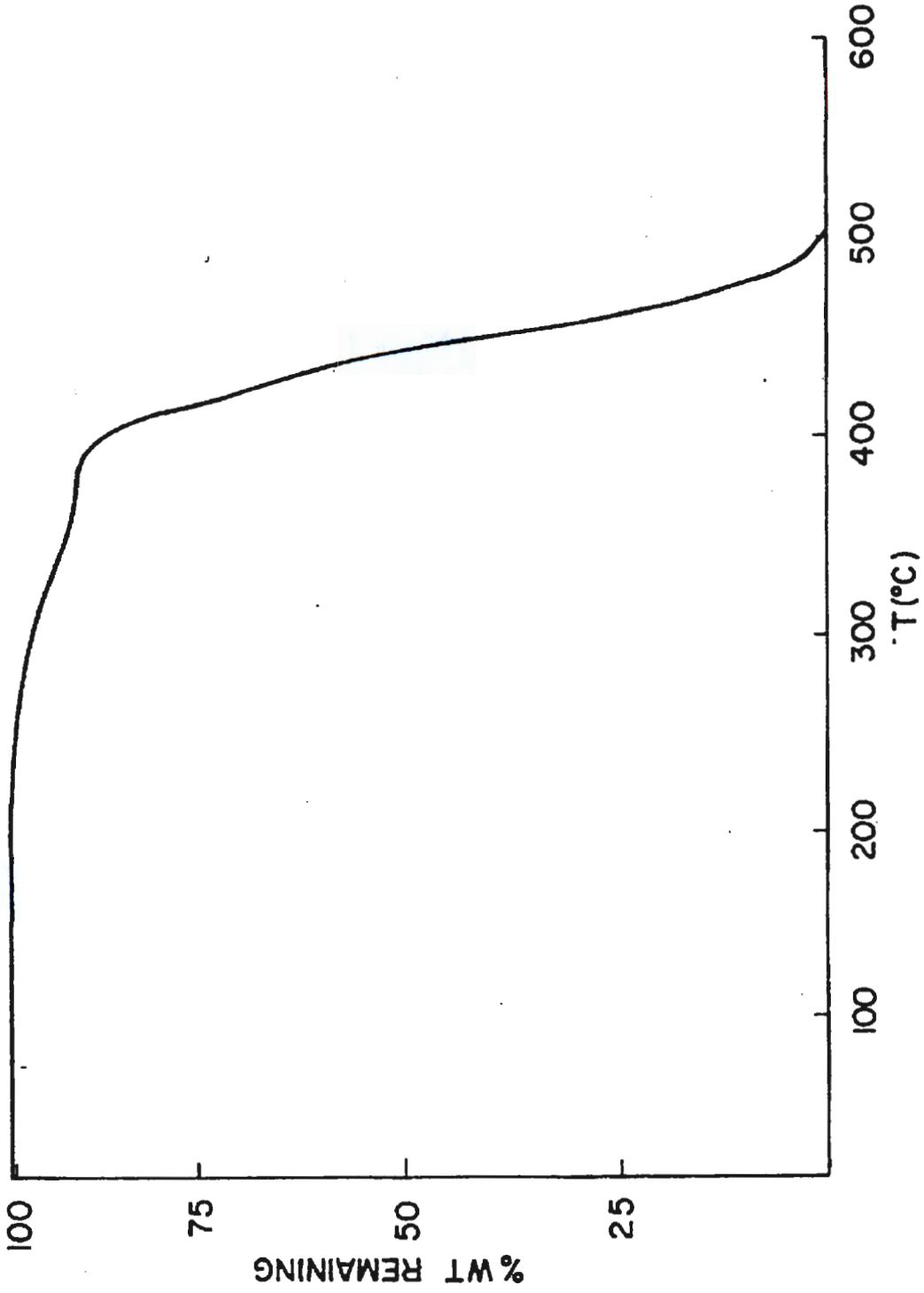


Figure 4. Thermographic Analysis of High-Density Polyethylene Pellets Heated at 10°C/min. in Air (from NTIS 1973)



2.1.3 Characteristics of Ignitability and Reactivity

Based on the process history and feed materials to the incinerator, there is a possibility that the Hanford Ash contains small particles of plutonium metal. Plutonium metal does have the potential to display the characteristic of reactivity. Process history of the Hanford Ash, however, does not indicate that there is any reason to assign this code to the waste. Hanford Ash has been processed on site and at Los Alamos with no recorded incidents of a problem with reactivity. In addition, any pieces of plutonium that might be present in the ash would be of miniscule size and mixed within a larger matrix of inert ash. The overall ash matrix which is the focus of the designation, therefore, would not present a potential reactivity concern.

The Washington State Department of Ecology (Ecology) largely incorporated the language of the Federal Hazardous Waste Regulations (RCRA) from 40 CFR 260 et seq., when it promulgated the Dangerous Waste Regulations in WAC 173-303. The designation criteria for ignitable, corrosive, and reactive waste, found in WAC 173-303-090, reflect the language used by EPA in 40 CFR 261.20 through .24 (Subpart C). The criteria for identifying characteristic hazardous wastes are set forth in 40 CFR 261.10:

(a) The Administrator shall identify and define a characteristic of hazardous waste in Subpart C only upon determining that:

(1) A solid waste that exhibits the characteristic may:

(i) Cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or

(ii) Pose a substantial present or potential hazard to human health or the environment when it is improperly treated, stored, transported, disposed of or otherwise managed; and

(2) The characteristic can be:

(i) Measured by an available standardized test method which is reasonably within the capability of generators of solid waste or private sector laboratories that are available to serve generators of solid waste; or

(ii) Reasonably detected by generators of solid waste through their knowledge of their waste.

The regulatory definitions of ignitability and reactivity do not include quantitative tests that would apply to the Hanford Ash. Although test methods have been identified to determine whether liquid wastes meet the criteria for ignitability, a determination of reactivity is premised upon qualitative, prose descriptions. Neither the Federal nor the State regulations provide a reference for test methods to determine the application of the reactive characteristics to solid waste forms.

The Federal Register of May 19, 1980, which established the definitions for characteristic wastes, indicates that a determination of reactivity or ignitability relies principally on the historical treatment of the waste by the generator. The EPA specifically states that the historical treatment of the waste by the generator is the most appropriate consideration for designation of

the waste for these characteristics. The preamble to the May 19, 1980, Federal Register states that the definition of reactive waste in the regulation is intended to:

> *"identify wastes which, because of their extreme instability and tendency to react violently or explode, pose a problem at all stages of the waste management process." 45 FR 33109- May 19, 1980, Characteristics of Hazardous Waste."*

A similar discussion is found with respect to ignitability:

> *"EPA's objective was to identify wastes capable of causing fires during transportation, storage, and disposal, and wastes capable of severely exacerbating a fire once started." 45 FR 33108*

The discussion in the preamble to the rulemaking goes on to state that the generator is in a position to know if the waste is reactive or ignitable and should be relied upon for the correct designation. Portions of this discussion are repeated in SW-846 and in subsequent questions and answers found on the RCRA hotline. With regard to reactivity the Federal Register (May 19, 1980) states that:

> *"The unavailability of suitable test methods for measuring the reactivity should not cause problems. Most generators of reactive wastes are aware that their wastes possess this property and require special handling. This is because such wastes are dangerous to the generators' own operations...." 45 FR 33110*

The discussion goes on to state:

> *"...the prose definition should provide generators with sufficient guidance to enable them to determine whether their wastes are reactive."*

To summarize, there is no available promulgated test to determine the characteristics of reactivity or ignitability. The experience and handling of Hanford Ash waste demonstrate clearly that the waste has not been handled as reactive or ignitable. During nearly 40 years of handling the Hanford Ash, no evidence that the waste will "pose a problem at all stages of the waste management process" has emerged. Indeed, there is no evidence that the waste creates any waste management problem beyond the requirements imposed by its plutonium content. There is no history of cans of Hanford Ash off-gassing, generating pressure, or bulging a can. Hanford Ash has not been managed as reactive or ignitable for the 40 years that these wastes have been generated, stored, and handled. No efforts have been made to maintain either a liquid cover (e.g., kerosene) or an inert gas cover (e.g., argon), or other forms of aggressive management. The wastes have been stored in cans that are not airtight and are exposed to both oxygen and atmospheric moisture. There are no recorded incidents of problems with these cans while in storage. In addition, based on the conditions of incineration, any reactive or ignitable constituents would have been destroyed. For these reasons, the Hanford Ash is not designated as reactive or ignitable.

2.1.4 State-Only Characteristic of Corrosivity

The characteristic of corrosivity, discussed in 40 CFR 261.22, does not provide for a federal corrosivity designation for solids. Washington State, however, provides for the testing of solids or semi-solids, using procedures specified at WAC 173-303-090(6)(a)(iii). This method requires mixing the solid waste with an equivalent amount of water and determining the pH of the resulting solution.

The ash material currently in storage at PFP includes metal oxides and possibly metal hydroxide salts. If these materials were mixed with an equal weight of water, the pH of the resultant solution/suspension may be 12.5 or greater. This would result in the waste being designated as corrosive per WAC 173-303-090(6)(a)(iii). Although the requisite 1:1 ratio (water to waste) pH test has not been performed on Hanford Ash to date, the material most likely would produce strongly alkaline pH conditions in water. This conclusion suggests that the waste should be assigned a state-only corrosive designation. For the reasons stated above in regards to the presence of TC metals, Fluor Hanford has chosen to designate the waste for corrosivity rather than to analyze for this characteristic.

2.1.5 Final Summary

The Hanford Ash is assigned a Washington State Dangerous Waste Number to indicate the presence of TC metals, based on process knowledge and limited analytical data. Because of the presence of metal oxides in the ash, it is assigned a Washington State-only designation for corrosivity.

Based on a consideration of the regulatory basis for determination of reactivity and ignitability, which relies on historical waste handling practices, the Hanford Ash is neither reactive nor ignitable. Operationally, the ash has been generated and stored for nearly 40 years at the Hanford Site in unvented containers exposed to the moisture in the atmosphere without any observed reaction. During that time, many containers of the waste have been opened, shipped to other DOE sites, dissolved in acid for leaching of plutonium, and/or repackaged and have not demonstrated any reactivity or ignitability hazard. The wastes do not pose a threat during storage, shipment, and ultimate disposal at WIPP. The discussions above demonstrate that Hanford Ash wastes are not "...wastes which, because of their extreme instability and tendency to react violently or explode, pose a problem at all stages of the waste management process."

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Attachment 6
April 18, 2000 Meeting Minutes

Meeting Title: PFP Project Managers Meeting

Date: February 14, 2001

MEETING MINUTES

SUBJECT: PFP TPA/RCRA ISSUES

TO: Distribution		BUILDING Ecology Kennewick Office		
FROM: R. E. Piippo		CHAIRMAN J. K. Yerxa		
DEPARTMENT-OPERATION-COMPONENT ECOLOGY/ORL/TPA PFP	AREA	SHIFT Day	DATE OF MEETING 4/18/2000	NUMBER ATTENDING 7

Appvl.: _____ Date: _____
Jon Yerxa, USDOE

Appvl.: _____ Date: _____
Andrea Hopkins, FLUOR

Appvl.: _____ Date: _____
Alex Stone, Ecology

Prepared by
Appvl.: _____ Date: _____
Laura Ruud, Ecology

ATTENDEES

J. Yerxa	A. Stone
R. Ollero	L. Ruud
A. Larsen	O. Wang
R. Piippo	A. Hopkins

Overview

Andrea Hopkins of Fluor Hanford (FH) on behalf of RL, discussed concern over Ecology's recent letters (2/24 and 3/6) that focused on some dangerous or mixed wastes currently being stored at PFP indicating that the USDOE and its contractor are at risk of enforcement for illegal storage. A history was provided by FH on previous discussions and letters that have passed between Ecology and RL on the subject of PFP RCRA waste storage and how waste storage has been a part of most recent TPA negotiation discussions with Roger Stanley of Ecology. Ecology and Energy have been engaged in discussions regarding joint AEA/RCRA management of mixed waste in the vaults and vault like rooms for several years. During TPA negotiations meetings held regarding storage issues at PFP, Ecology representatives assured Energy that vault and vault like room storage issues would be negotiated.

In technical discussions held in 1997, Ecology representatives acknowledged the difficulties in permitting the vaults citing ALARA and safeguards concerns. Members of Ecology staff toured the vaults and vault like rooms and were provided a point by point comparison of AEA management requirements and RCRA container management requirements. The letter of April 17, 1996 from Ecology to Energy offers "enforcement discretion" during stabilization activities.

RL has declared some Pu bearing residues as RCRA waste during the October 28, 1999 meeting held with Ecology staff. Detailed information regarding storage was provided to Ecology representatives the same day in a classified meeting.

RL is in the process of jointly scheduling with Ecology the resumption of TPA negotiations immediately following the designation of waste that had been planned to begin in Jan. 2000. This was the last issue to be resolved in the suspended negotiations. Also in the meeting Ecology informed RL that the TPA negotiations have been put on hold by Roger Stanley due to ORP activities and it is not expected that Roger will be available for several months. Consequently Andrea proposed meetings between Ecology cleared staff and RL cleared staff to discuss RCRA waste management issues that would build on the October 28, 1999 waste declaration due to the delay in entering TPA transition negotiations.

Also in the meeting, the EIS and ROD were discussed as well as a description of the IPMP lending itself to TPA actions and its update in the near future. The IPMP was mentioned as a firm planning document that would be valuable to the TPA negotiations. Rob Piippo highlighted the additional dose/ALARA impact that will occur from employees labeling vault stored residues to comply with RCRA as an issue that will have to be addressed by the agencies as it has been discussed by HAB members. The difference between the PFP Slab on Grade transition versus the PUREX/B Plant transitions was also highlighted.

Alex Stone and Laura Rudd discussed the lack of timely action from RL on the declaration of waste based on PFP 1995 shutdown and 3 years after negotiations were suspended over the waste designation issue in Dec 1997. Alex discussed getting with Roger Stanley to discuss the history of PFP TPA negotiations, if Roger was satisfied that the three issues that suspended negotiations have been adequately resolved and if he was ready to engage on PFP negotiations. Alex handed out an Email from Laura Cusack to C. Clark that discussed the Part B application and that a three month extension from October has been discussed in Ecology. Laura was interested in focusing on the big picture of PFP which included stabilization, transition and what has Roger Stanley felt was the TPA negotiation path forward. Laura requested NEPA EIS ROD and holdup waste information and Oliver touched on the Part B application due October 31, 2000.

Action Items

1. Alex Stone will call Roger Stanley and discuss the status of PFP negotiations, resolution of the three issues that suspended negotiations and residue waste designation path forward.
2. Andrea Hopkins will provide EIS ROD information.
3. Jon Yerxa will coordinate scheduling an afternoon tour/presentation of PFP for May 10-11.
4. Alex will have Jerry Yokel contact Andrea Hopkins to discuss a split sample.

Attachment 7
February 14, 2001 RCRA/AEA Presentation Meeting Minutes

Meeting Title: PFP Project Managers Meeting

Date: February 14, 2001

RCRA-Equivalent Management of Pu-Bearing Dangerous Waste

February 14, 2001

Introduction

- Purpose
- History
- Potential Applicability
- Results of the Evaluation
- Path Forward

Purpose

- To set forth proposed management standards for Pu-bearing dangerous wastes in PFP vaults and vault-type rooms.
  - These standards must be equally or more protective of human health and the environment than standards established under the dangerous waste regulations.
- To gain agreement on the use of the proposed management standards.

History

- Comparisons of RCRA requirements to other requirements applicable to storage of Pu-bearing waste and material have been discussed in numerous meetings and letters since 1997:
  - Vault storage
  - Material stabilization (cementation)
  - Repackaging ash.

Potential Applicability

- Storage of Pu-bearing dangerous waste, as defined (in part) in April 3, 2000 letter from RL to Ecology [Response to Requests for RCRA documentation Related to Operation of the PFP Treatment Unit (TSD: T-2-9)] in
- PFP vaults and vault-type rooms, as defined in DOE Order 6430.1A, General Design Criteria.

Results of the Evaluation

- Interim status container management standards and general facility standards were evaluated against comparable Atomic Energy Act/DOE drivers and/or implementing requirements or procedures.
- Areas of concern:
  - container labeling: WAC 173-303-630(3), -395
  - condition of containers: 40 CFR 265.171
  - containers closed: 40 CFR 265.173 (a)
  - inspections: 40 CFR 265.174, WAC 173-303-320
  - incompatibles: 40 CFR 265.177

Results (continued)

- Areas of concern (continued):
  - public involvement: WAC 173-303-281 (NOI), -282 (siting)
  - permitting and closure: WAC 173-303-805, 40 CFR 265 Subpart G
  - waste analysis: WAC 173-303-300
  - security: WAC 173-303-310
  - training: WAC 173-303-330; 340; 350(1), (3), (4), (5); -355
  - aisle spacing: WAC 173-303-360
  - record keeping and reporting: WAC 173-303-380, -390
  - LDR: WAC 173-303-140, -280, and 40 CFR 268

Results (continued)

RCRA requirement	Current application of requirement	Proposed method of management
Container labeling - identify major risks/hazard	Major risk is considered to be radioactivity; no chemical hazard labels are applied to containers.	If a vault or vault-type room is known to contain hazardous waste, mark primary entrance to vault area to identify known major chemical hazard(s) of the waste. Include appropriate notation on vault sign-in log. If a container of characterized mixed waste is removed from the vault for any purpose (e.g., is actively managed for the purpose of NDA or stabilization), modify label to identify known major chemical hazard(s) of the waste. If a likely mixed waste that has not been characterized is removed, modify label only to indicate item is dangerous waste.
Condition of containers - transfer waste if container leaking or in bad condition	Impaired or suspect containers found in vaults are required to be moved to a glovebox within one day or as soon as disposition is viable, based on a technical evaluation.	Impaired or suspect containers are handled in a limited number of gloveboxes in vault-type rooms at the plant. Once removed to a glovebox, an impaired or suspect dangerous waste residue container may remain in storage in that glovebox until it is stabilized and/or repackaged with other items of the same residue category.
Containers closed except when adding or removing waste	No specific equivalent requirement was found addressing closure except when adding or removing waste. However, requirements are in place for ensuring containers contain dispersibles, inner container lids are mechanically sealed, and security seals are applied to outer containers in storage.	No change from current mode is proposed. Identified dangerous waste is contained in closed, non-vented containers.

Results (continued)

RCRA requirement	Current application of requirement	Proposed method of management
Perform periodic general inspections and weekly inspections of DW container storage area	Routine surveillance and maintenance activities and specified preventive maintenance actions are performed in accordance with procedures. Container integrity is carefully monitored, with frequency of inspections driven by ALARA concerns. General room inspections are conducted to support rad con surveys, equipment inspections, etc., as often as weekly. Frequency of container inspections varies depending on container contents, but is no less frequent than annual. Some locations are under video surveillance at all times.	No change from current mode is proposed due to ALARA concerns. Current inspection programs are as protective of human health as increased inspections would be.
Special requirements for incompatible waste	A portion of the Pu-bearing DW has been characterized. Detailed requirements are in place governing storage configurations. No ignitable or reactive wastes are stored in the vaults/vault-type rooms. Incompatibles are not stored within a single container; physical barriers are placed between containers of different types of DW.	No change from current mode is proposed. Characterization activities will continue in support of stabilization activities.
Public Involvement	See proposal.	Notice of Intent and Facility Siting regulations require public involvement. A significant Class II modification of the TPA to include interim milestones for removing DW from the vaults and vault-type rooms will require public involvement.
Permitting and closure/post-closure	See proposal.	Negotiate compliance agreement under Section 8 of the TPA to cover removal of DW from the vaults and vault-type rooms and transition of the PFP.

Results (continued)

RCRA requirement	Current application of requirement	Proposed method of management
Waste analysis	Some analytical information is available for mixed waste residues, and "predeterminations" of applicable waste codes have been made. A written RCRA waste analysis plan and formal waste designations are available for some mixed waste residues.	Dangerous wastes will be designated per negotiated method in support of stabilization and disposition activities (i.e., to support active management). Process knowledge will be used to the extent possible for designation; physical sampling/characterization will be performed only as necessary when wastes are withdrawn from the vaults for stabilization or repackaging. Additional handling of Pu-bearing waste solely for the purpose of sampling/designation prior to stabilization/repackaging is contrary to ALARA principles.
Security	Although restricted access signs may not be posted per regulation, the vaults and vault-type rooms are within the PFP exclusion area. As such, they are protected under heavy security. Details of the security measures are classified.	No change from current method is proposed.
Training	PFP maintains a RCRA training plan, WHC-SD-WM-TR-028, that identifies required training for advanced general workers. This plan does not directly address vault storage activities.	Responsible managers must review job tasks performed by employees to evaluate training requirements. Employees potentially exposed to DW residues must receive 24-hour training or equivalent. During the revision of the existing training plan to the new format, specific language addressing vault storage activities will need to be added, using 324 Building training plan as a model.

USE 222S

Results (continued)

RCRA requirement	Current application of requirement	Proposed method of management
Aisle spacing	Criticality and radiological concerns drive storage configurations; therefore, storage configuration may not comply with aisle space requirement of WAC 173-303-340(3). However, storage configurations provide equivalent level of protection to human health and the environment and also support container inspection requirements.	No change from current mode is proposed.
Record keeping	PFP maintains process knowledge data, material tracking records (such as the computer-based LANMAS and material transfer and inventory records), records of inspections for bulging cans and for radiological purposes, etc. Available waste designation, quantity, and handling information and inspection data are recorded, but not as part of a RCRA operating record. Level of detail and record retention/disposition requirements may differ.	Tie existing records to environmental record keeping activities.
Reporting	Dangerous wastes in vaults and vault-type rooms are not part of SWITS and are not included on the dangerous waste annual report.	Once DW has been designated and packaged for disposal, paperwork will be prepared to transfer the waste to CWC. At that time, the waste will be included in SWITS and future annual dangerous waste reports. (Follows 324 model and handling of waste in SAAs.)
LDR	Not applicable to wastes to be disposed at WIPP [WAC 173-303-140(4) and P.L. 104-201 § 3188(a)].	RL will comply with agreements currently being negotiated regarding application of LDR on the Hanford Site.

Path Forward

- Provide opportunity for Ecology to review and comment on proposals
- Finalize agreement and document results
  - Signed meeting minutes, letter, MOA, other method?
- Implement agreement
- Goal: Resolve most vault storage issues before formal negotiations (June 1, 2001 commitment).

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