PART V, CLOSURE UNIT 7 UNIT-SPECIFIC CONDITIONS

241-Z Treatment and Storage Tanks

The 241-Z Treatment and Storage Tanks was a storage tank treatment system. This system stored and treated liquid mixed waste generated from PFP process activities prior to the waste being transferred to Double-Shell Tanks for storage until final disposition. This permit sets forth the closure requirements for this TSD unit.

V.7.A. COMPLIANCE WITH APPROVED CLOSURE PLAN

The Permittees shall comply with all requirements set forth in Hanford Facility Dangerous Waste Permit, as specified in Permit Attachment 3, Permit Applicability Matrix and the unit-specific conditions identified below for the 241-Z Treatment and Storage Tanks.

In the event that the Part V – Unit-Specific Conditions for 241-Z Treatment and Storage Tanks conflict with the Part I – Standard Conditions and/or Part II – General Facility Conditions of the Permit the unit-specific conditions for 241-Z Treatment and Storage Tanks prevail.

CLOSURE UNIT 7:

Part A Form, Revision 6, dated June 5, 2000

Chapter 1.0 Introduction, dated March 2004

Chapter 2.0 System Description, dated March 2004

Chapter 3.0 Process Information, dated March 2004

Chapter 4.0 Waste Characteristics, dated March 2004

Chapter 5.0 Groundwater Monitoring, dated March 2004

Chapter 6.0 Closure Strategy and Performance Standards, dated March 2004

Chapter 7.0 General-Closure Activities, dated March 2004

Chapter 8.0 Post-Closure, dated March 2004

Chapter 9.0 References, dated March 2004

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Please print or type in the unshaded areas only
(fill- in areas are spaced for elite type, i.e., 12 character/inch).

FORM 3

DANGEROUS WASTE PERMIT APPLICATION

1. EPA/STATE I.D. NUMBER: W A 7 8 9 0 0 0 8 9 6 7

FOR OFFICIAL USE ONLY

APPLICATION APROVED	DATE RECEIVED *(mo., day, & yr.)*	COMMENTS
		60-Day Automatic Approval 7/5/2000 [WAC 173-303-805(7)(a)(i)]

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA/STATE I.D. Number, or if this is a revised application, enter your facility's EPA/STATE I.D. Number in Section I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

☐ 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

MO.	DAY	YR.
03	22	43

*FOR EXISTING FACILITIES, PROVIDE THE DATE *(mo., day, & yr.)* OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*
* The date construction of the Hanford Facility commenced.

☐ 2. NEW FACILITY *(Complete item below.)*

MO.	DAY	YR.

FOR NEW FACILITIES, PROVIDE THE DATE, *(mo., day, & yr.)* OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION 9*place an "X" below and complete Section I above)*

☒ 1. FACILITY HAS AN INTERIM STATUS PERMIT

☒ 2. FACILITY HAS A FINAL PERMIT

III. PROCESSES – CODES AND CAPACITIES

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the *(Section III-C).*

B. PROCESS DESIGN CAPACITY – For each code entered in column A enter the capacity of the process.

1. AMOUNT – Enter the amount.
2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER (barrel, drum, etc.)	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D80	GALLONS OR LITERS
LANDFILL	D81	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D82	*ACRES OR HECTARES*
OCEAN DISPOSAL	D83	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D84	GALLONS OR LITERS
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER (Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided: Section III-C.)	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECATRES	Q

EXAMPLE FOR COMPLETING SECTION III *(shown in line numbers X-1 and X-2 below): A facility has two storage tanks; one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.*

LINE NUMBER	A. PROCESS CODE *(from list above)*	B. PROCESS DESIGN CAPACITY 1. AMOUNT *(specify)*	2. UNIT OF MEASURE *(enter code)*	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE *(from list above)*	B. PROCESS DESIGN CAPACITY 1. AMOUNT *(specify)*	2. UNIT OF MEASURE *(enter code)*	FOR OFFICIAL USE ONLY
X-1	*S 0 2*	*600*	*G*		*5*				
X-2	*T 0 3*	*20*	*E*		*6*				
1	S02	69,300	L		*7*				
2	T01	16,277	V		*8*				
3					*9*				
4					*10*				

Continued from the front.

III. PROCESSES (continued)

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESS (code "T04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

S02

The 241-Z Treatment and Storage Tanks (241-Z) support the Plutonium Finishing Plant (PFP), which was constructed in November 1948. The 241-Z consists of storage tanks D-4, D-5, D-7, D-8, and an overflow tank. Tanks D-5 and D-8 also serve as the waste treatment tanks. These tanks, located in the belowground portion of the 241-Z Building, have a combined storage capacity of 69,300 liters (18,307 gallons). Tanks D-4 and D-5 each have a capacity of 16,400 liters (4,332 gallons), while tanks D-7 and D-8 each have a capacity of 17,900 liters (4,729 gallons). The overflow tank, located in the D-7 Vault, has a capacity of 700 liters (185 gallons) and is in place to serve only in a capacity for receiving waste that might overflow from one of the other tanks. The overflow tank is not in place to serve as storage capacity for dangerous waste. The 241-Z accumulates and stores mixed waste generated from PFP process activities. Once treated, the waste is stored before final transfer to the Double-Shell Tank (DST) System. The original construction of 241-Z included a fifth 16,400-liter (4,332-gallon) tank that also is located in the belowground portion of the facility. Tank D-6 was taken out of service and isolated from the 241-Z tank system in 1972 and never stored dangerous waste. The purpose of identifying tank D-6 is to note its existence within the 241-Z Building, but not to include it with the tank system covered by the Part A, Form 3, for the 241-Z. The maximum process design capacity for tank storage is 69,300 liters (18,307 gallons).

T01

Treatment that occurs in tanks D-5 and D-8 consists of a batch process that includes the addition of sodium hydroxide or potassium hydroxide, sodium nitrite, ferric nitrate, and water. The sodium hydroxide is added to adjust the pH of the waste to make the waste more amenable for transfer to the DST System. Ferric nitrate solution is added to provide 1 percent stable solids for transfer to the DST System, while water could be used to adjust the plutonium concentration of the waste to be transferred so that the waste meets the DST System criteria for acceptance. This treatment process makes the waste more amenable for transfer to the DST System. The maximum process design capacity for tank treatment is 16,277 liters per day (4,300 gallons per day).

IV. DESCRIPTION OF DANGEROUS WASTES

A. DANGEROUS WASTE NUMBER – Enter the four digit number from Chapter 173-303 WAC for each listed dangerous waste you will handle. If you handle dangerous wastes which are not listed in Chapter 173-303 WAC, enter the four digit number(s) that describes the characteristics and/or the toxic contaminants of those dangerous wastes.

B. ESTIMATED ANNUAL QUANTITY - For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE - For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed dangerous waste: For each listed dangerous waste entered in column A select the code(s) from the list of process codes contained in Section III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed dangerous wastes: For each characteristic or toxic contaminant entered in Column A, select the code(s) from the list of process codes contained in Section III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed dangerous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: DANGEROUS WASTES DESCRIBED BY MORE THAN ONE DANGEROUS WASTE NUMBER - Dangerous wastes that can be described by more than one Waste Number shall be described on the form as follows:

1. Select one of the Dangerous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other Dangerous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other Dangerous Waste Number that can be used to describe the dangerous waste.

EXAMPLE FOR COMPLETING SECTION IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* - A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
X-1	*K 0 5 4*	*900*	*P*	*T 0 3 D 8 0*	
X-2	*D 0 0 2*	*400*	*P*	*T 0 3 D 8 0*	
X-3	*D 0 0 1*	*100*	*P*	*T 0 3 D 8 0*	
X-4	*D 0 0 2*			*T 0 3 D 8 0*	*included with above*

 CONTINUE ON PAGE 3

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I. D. NUMBER *(entered from page 1)*

W	A	7	8	9	0	0	0	8	9	6	7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*				D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	D002	1,360,777	K	T01				Treatment - Tank
2	D004							
3	D005							
4	D006							
5	D007							
6	D008							
7	D009							
8	D010							
9	D011							
10	D019							
11	WT01							
12	WT02							Included with above.
13	D002	2,494,758	K	S02				Storage - Tank
14	D004							
15	D005							
16	D006							
17	D007							
18	D008							
19	D009							
20	D010							
21	D011							
22	D019							
23	WT01							
24	WT02							Included with above.
25								
26								

Continued from the front.

IV. DESCRIPTION OF DANGEROUS WASTE (continued)

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM SECTION D(1) ON PAGE 3.

The waste received by the 241-Z from PFP process activities could be assigned one or more of the following dangerous waste numbers as determined through process knowledge, modeling, and some process sampling. Waste could designate corrosive (D002), and/or toxic for arsenic (D004), barium (D005), cadmium (D006), chromium (D007), lead (D008), mercury (D009), selenium (D010), silver (D011), or carbon tetrachloride (D019). Depending on the waste stream received, the waste also could designate as a state-only toxic dangerous waste (WT01 or WT02).

V. FACILITY DRAWING Refer to attached drawing(s).

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*.

VI. PHOTOGRAPHS Refer to attached photograph(s).

All existing facilities must include photographs *(aerial or ground-level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail)*.

VII. FACILITY GEOGRAPHIC LOCATION This information is provided on the attached drawings and photos.

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*

VIII. FACILITY OWNER

[X] A. If the facility owner is also the facility operator as listed in Section VII on Form 1, "General Information," place an "X" in the box to the left and skip to Section XI below.

B. If the facility owner is not the facility operator as listed in Section VII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	SIGNATURE	DATE SIGNED
Keith A. Klein, Manager U.S. Department of Energy Richland Operations Office	[signature]	5/5/00

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	SIGNATURE	DATE SIGNED
SEE ATTACHMENT		

 CONTINUE ON PAGE 5

X. OPERATOR CERTIFICATION

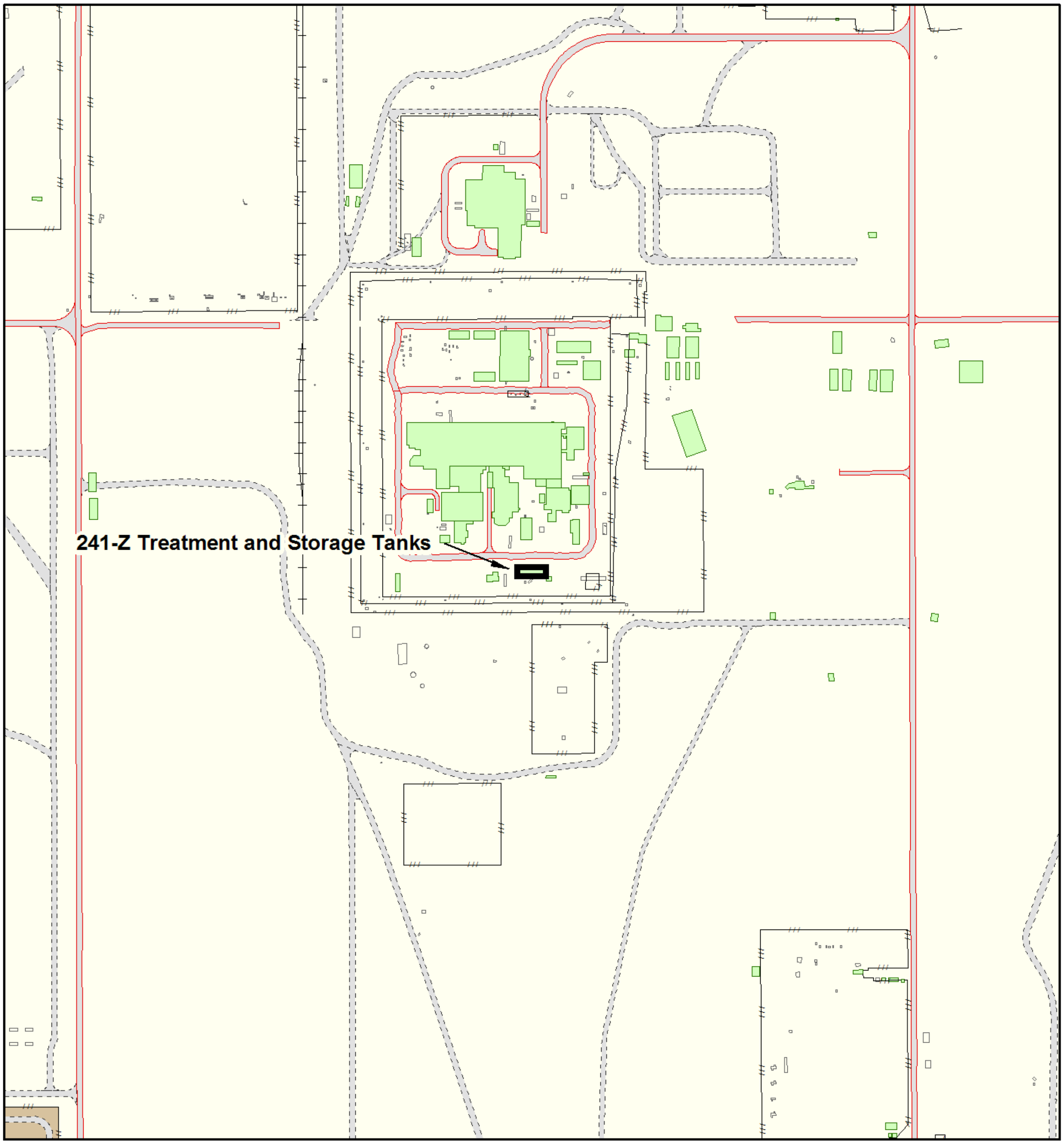
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Owner/Operator
Keith A. Klein, Manager
U.S. Department of Energy
Richland Operations Office

5/5/00
Date

/FOR
Co-operator
Ron D. Hanson
President and Chief Executive Officer
Fluor Hanford

4-10-00
Date



241-Z Treatment and Storage Tanks

Prepared for:
US DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE

Created and Published by: Central Mapping Services
Fluor Hanford, Richland, WA (509) 376-8759

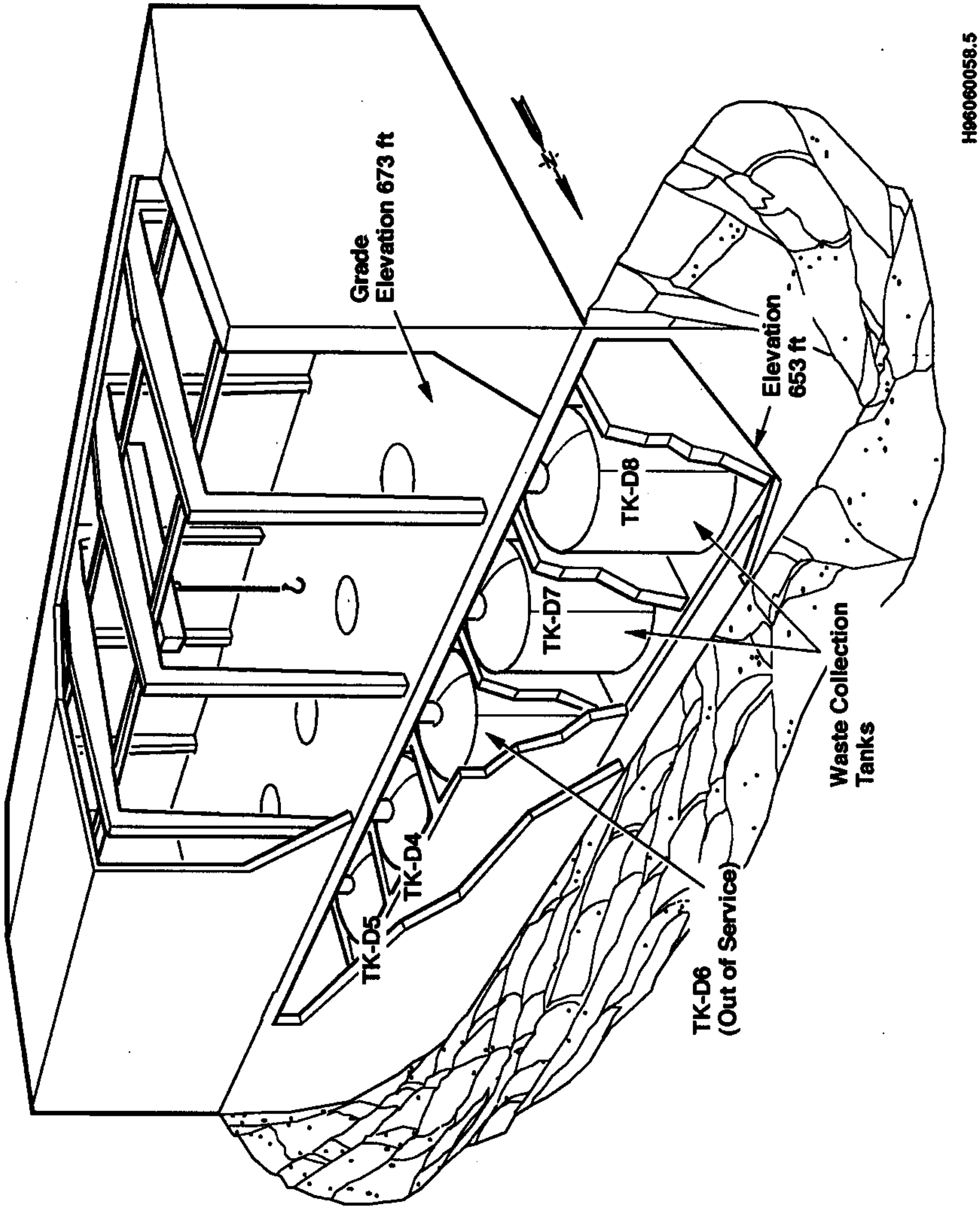
INTENDED USE: REFERENCE ONLY

TSD Unit Boundary
DOE Operating Areas
Hanford Facility
Major Roads
Service Roads
Buildings and Mobiles
Structures
Concrete
Railroads
Fences

Meters: 0 50 100 150 200
Feet: 0 200 400 600

241-Z Building

Cutaway View



241-Z Building

Chapter 1.0 Introduction

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1.0 INTRODUCTION

This certified closure plan for the 241-Z Treatment and Storage Tanks (241-Z) *Resource Conservation and Recovery Act* (RCRA) *of 1976* treatment, storage, and/or disposal (TSD) unit is being submitted to the Washington State Department of Ecology (Ecology) in accordance with *Hanford Federal Facility Agreement and Consent Order* (TPA) Milestone M-83-30. This milestone requires submittal of a certified closure plan for the "241-Z Waste Treatment Facility" by July 31, 2003 (Ecology et al. 1996). The 241-Z Waste Treatment Facility and the 241-Z are synonymous.

Detailed discussion of 241-Z processes and equipment and of the waste types treated and stored at the unit is provided in Chapters 3.0 and 4.0, respectively. Although the treatment, storage and/or disposal of radioactive waste (i.e., source, special nuclear, and by-product materials as identified in the *Atomic Energy Act of 1954*) are not within the scope of RCRA or Washington Administrative Code (WAC) 173-303, information is provided for general knowledge.

The 241-Z is a tank system for treatment and storage of corrosive, plutonium-bearing liquid waste from activities at the Plutonium Finishing Plant (PFP). 241-Z waste is transferred to the double-shell tanks (DST System) for storage until final disposition. 241-Z currently is operating and will continue to operate until closure under this plan. That could occur sometime between June 30, 2005 and September 30, 2011, the dates when 241-Z will receive the final volume of waste from PFP in support of TPA Milestone M-83-31 and when closure plan activities are required to be completed in accordance with TPA Milestone M-83-32, respectively.

The 241-Z consists of belowgrade tanks D-4, D-5, D-7, and D-8, an overflow tank located in a concrete containment vault, sample glovebox GB-2-241-ZA, and associated ancillary piping and equipment. The tank system is located beneath the 241-Z Building, which is not a portion of the TSD unit. Waste managed at the TSD unit is received via underground piping from PFP sources. Tank D-6 within vault D-6 is a past-practice tank that never operated as a portion of the RCRA unit. Tank D-6, its containment vault cell, and soil beneath the vault that were potentially contaminated during past-practice operations and any other potential past-practice contamination identified during 241-Z closure while outside the scope of this 241-Z closure plan will be addressed concurrent with the RCRA activities described in this plan.

Under this closure plan, the 241-Z is anticipated to undergo clean closure to the performance standards of WAC 173-303-610 with respect to dangerous waste contamination from RCRA operations. The unit will be clean closed if physical closure activities identified in this plan achieve clean closure standards for all 241-Z locations. The scope of closure activities under this plan will be similar to the scope of 241-Z 'terminal cleanout' activities in support of PFP deactivation, that will include but are not limited to tank system decontamination and visual inspections or sampling to verify clean closure levels. Clean closed 241-Z tanks and/or structures will remain after closure for future disposition in conjunction with PFP decommissioning activities.

If the 241-Z cannot be clean closed under this plan, remaining TSD unit contamination will be addressed under a future CERCLA response action outside the scope of this plan. Final closure would occur after disposition of remaining TSD unit contamination in conjunction with the appropriate future *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) *of 1980* action(s) (Chapter 6.0, Section 6.1). The schedule for the CERCLA action is established in TPA milestones. The period during which TSD unit closure is awaiting the CERCLA action (i.e., while the unit is not operating but is unclosed) will be identified as an approved extended closure period and compliance schedule for meeting RCRA TSD unit closure requirements. The 241-Z Part A, Form 3, would be modified to identify clean closed and unclosed portions of the TSD unit for monitoring until final closure. The results of final closure activities would be documented in a modification to the HF RCRA Permit.

Extension of the closure period and integration of 241-Z closure with future CERCLA activities in this manner are acceptable because after decontamination under this plan, the unit will pose minimal risk to human health and the environment. Also, integration of RCRA and CERCLA activities is consistent with TPA Section 6.0, and the HF RCRA Permit, Section II.K.7 that encourage coordination of RCRA unit closure with other statutorily or regulatorily mandated cleanups (e.g., CERCLA) to avoid duplication of effort and with TPA Milestone M-83-32 that reflects coordination of CERCLA action(s) with 241-Z closure activities, as necessary.

Chapter 2.0 System Description

Figures

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2.0 SYSTEM DESCRIPTION

This chapter provides a description of the 241-Z and provides security information.

2.1 SYSTEM DESCRIPTION AND OPERATIONS

The 241-Z are part of the PFP complex (Figures 2-1 and 2-2) that is located in the 200 West Area of the Hanford Site. Construction of PFP began in 1948 and was completed in 1951. 241-Z vault and tank installation was completed and first put into use in 1949. The 241-Z Building was constructed in 1979 as weather protection for tank system equipment. PFP was the final link in the plutonium manufacturing chain on the Hanford Site that processed plutonium-bearing chemical solutions into metal and oxide. This process ended in May 1989. 241-Z continues to receive, store, and treat process waste generated during PFP operations and decommissioning activities. The waste is treated in the tank system for transfer to the DST System. Waste managed at this unit is received via underground piping from PFP sources.

The 241-Z TSD unit boundary is defined in the 241-Z Part A, Form 3, as beginning at the 241-Z vault cell walls. The TSD unit boundary includes waste transfer piping and sample piping within the cells and associated ancillary piping and equipment used for transfer of waste from PFP dangerous waste sources described in Chapter 3.0 to 241-Z during RCRA operations. Tank D-6 is located in the middle vault cell and was removed from service after it failed in 1972 (before RCRA operations). Although part of the overall 241-Z terminal cleanout activity, D-6 is a past-practice tank that will be dispositioned under CERCLA authority outside the scope of this closure plan. The concrete pipe trench (Figure 2-7, Note 2) between PFP and 241-Z containing ancillary piping is a past-practice infrastructure that predates RCRA operations and will be dispositioned under CERCLA authority outside the scope of TSD unit closure.

Detailed discussion of 241-Z processes and equipment and of the waste types treated and stored at the unit is provided in Chapters 3.0 and 4.0, respectively. Although the treatment, storage and/or disposal of radioactive waste (i.e., source, special nuclear, and by-product materials as identified in the *Atomic Energy Act of 1954*) are not within the scope of RCRA or WAC 173-303, information is provided for general knowledge.

2.1.1 241-Z Tanks and Vault

The 241-Z system consists of four large, single-wall stainless steel tanks, D-4 and D-5 of approximately 16,400 liters, tanks D-7 and D-8 of approximately 17,900 liters; an overflow tank in D-7 cell of approximately 700 liters; ancillary piping and equipment; and containment structures (Figure 2-3, 2-4, and 2-5). The tanks are flat with sloped bottoms on concrete support pads having a layer of grout between the top of the pad and the bottom of the tank. The tanks are housed individually in a ventilated belowgrade, reinforced concrete vault that is separated into five separate cells. The floors and walls of each vault cell has been painted, however, much of the paint has deteriorated significantly. The cells have no floor drains but contain sumps and serve as containment for the tanks in the event of tank overflow or failure of tanks or piping.

Waste generated during PFP decommissioning operations is transferred via a buried pipeline to tank D-8. From tank D-8, the waste is transferred to tank D-5 for treatment by pH adjustment to meet DST System waste acceptance criteria (DOE-RL-90-39) before being transferred to the DST System. Tanks D-4 and D-7 began receiving waste from PFP operations before 1994, but now provide reserve storage capacity. Any overflow from any of the tanks, is directed initially to the overflow tank in D-7 cell from which the waste is pumped to tank D-4, to tank D-7, and to tank D-5 before being transferred to the DST System (Figure 2-6). The floor of each cell is sloped toward the sump located in a corner of the cell floor. Except for D-5 cell, any liquid can be jetted via a steam jet from the cell sump into tank D-4. Tank D-5 cell sump is jetted into tank D-5 (Figure 2-7). Tank D-5 is equipped with a pump and a steam jet for use in waste transfers. The tanks also can collect small amounts of steam condensate resulting from operation of the steam jet systems.

In the past, sodium hydroxide used for waste pH adjustment was provided from aboveground tank D-9, in the 241-ZB area, which is a concrete pad outside the 241-Z Building. Sodium or potassium hydroxide are now added through chemical addition tanks D-10 and D-11, which are two 190-liter tanks located inside the 241-Z Building. Other chemicals (e.g., sodium nitrite and ferric nitrate) are added, as required, through tanks D-10 and D-11 to meet DST System waste acceptance criteria. Tanks D-9, D-10 and D-11 are chemical product tanks that did not manage RCRA waste and are outside the scope of TSD unit closure.

Air is drawn from the cells and tanks and is heated, filtered through high-efficiency particulate air (HEPA) filtration, and discharged to the atmosphere through a 7.6-meter stainless steel stack (296-Z-3). The 296-Z-3 Stack and associated fans, filters, and controls are located on a concrete pad outside the southwest corner of the 241-Z Building. Exhaust air from the 241-Z Building is monitored per applicable radioactive air emission requirements implemented by the Washington State Department of Health (WDOH) and the U.S. Environmental Protection Agency (EPA).

2.1.2 Support Buildings and Structures

The 241-Z Building and the 241-ZA and 241-ZB structures (Figure 2-2) house equipment and product chemicals used in 241-Z operations that includes a sample glovebox and sample piping. Except for the glovebox and sample piping, these structures and components are outside the scope of TSD unit closure.

2.1.2.1 241-Z Building

The 241-Z Building (Figure 2-3) is a pre-engineered corrugated metal enclosure built in 1979 to provide weather protection for the vault and equipment. The 241-Z Building is approximately 6 meters wide, 28 meters long, and 6.7 meters deep and is located about 100 meters south of the 234-5Z Building. The abovegrade portion of the 241-Z Building never was used to treat or store dangerous waste. The building covers the vault coverblocks, steam jet equipment, HEPA filters, ventilation equipment for the tanks and cells, and chemical addition tanks D-10 and D-11. A 1.5-ton crane runs the length of the building near the ceiling. There is a personnel access door at the south end of the east wall and at the west end of the south wall. An electrically operated door is located in the middle of the south wall. There are two windows on the north wall. A 45.7-centimeter diameter ventilation duct exits abovegrade through the southern wall in the southwest corner of the building.

2.1.2.2 241-ZA and 241-ZB Structures

The 241-ZA and 241-ZB structures (Figure 2-2) house equipment used in 241-Z operations. The 241-ZA houses sample glovebox GB-2-241-ZA used for collecting and packaging samples taken from the 241-Z tanks. The glovebox measures approximately 0.7 meters deep, 1.2 meters wide, and 0.9 meters high and is constructed of stainless steel with glass panels. The glovebox receives the ½” diameter sample lines from the 241-Z tanks and uses a valve manifold to allow an individual tank to be selected for sampling. A tank waste sample is removed from the glovebox in a clean container using a ‘bagout’ system for laboratory analysis. The glovebox exhaust is vented back through the 241-Z ventilation system. The glovebox contains only minor residual contamination. This glovebox and sample piping will be closed under this plan.

The 241-ZB area, located adjacent to the 241-Z Building, is a concrete pad and spill barrier housing caustic storage tank D-9 that historically provided sodium hydroxide, a caustic treatment chemical used for waste pH adjustment, to 241-Z. There are two sumps located within the spill barrier and one sump located in the concrete pad adjacent to tank D-9. This system did not manage waste and the location does not house ancillary equipment.

2.1.3 Waste Transfer Piping from 234-5Z, 242-Z, and 236-Z Buildings

Waste transfer piping from PFP sources to 241-Z is identified in Figure 2-8. Until 1994, separate transfer lines existed for tanks D-4, D-5, D-6, D-7, and D-8 from various PFP dangerous waste sources. Out of service piping that transferred waste from 234-5Z and related buildings (242-Z and 236-Z) remains in a covered, underground concrete pipe trench to the 241-Z Building (Figure 2-8). The trench contains piping that is currently in use, piping that was in service during the period of RCRA regulated operations, and piping that was removed from service before RCRA regulations. Currently only one double-walled pipe from 234-5Z is active and transfers waste to tank D-8. All piping, except the piping to failed tank D-6 was in service during RCRA operations and is ancillary piping within the scope of 241-Z closure. Removal of underground piping is not within the scope of terminal cleanout activities or this closure plan. Radiologically contaminated underground piping, including any unclosed RCRA ancillary piping, will be dispositioned under the appropriate CERCLA response action. One minor leak from this piping described in Chapter 3.0, Section 3.3.1, due to piping failure is documented to have occurred during RCRA operations.

2.2 SECURITY INFORMATION

Security information for the Hanford Facility is discussed in Section 6.1 of the HF RCRA Permit, GIP, DOE-RL-91-28.

Staffed barricades are maintained around the clock at checkpoints on vehicular access roads leading to the 200 Areas (Yakima, Rattlesnake, and Wye Barricades). All personnel accessing the Hanford Facility areas must display a U.S. Department of Energy (DOE)-issued security identification badge indicating authorization. Personnel also are subject to random search of items carried into or out of the Hanford Facility. Signs posted at the 200 West Area boundaries inside the Hanford Facility, or an equivalent legend, state:

NO TRESPASSING. SECURITY BADGES REQUIRED BEYOND THIS POINT. GOVERNMENT VEHICLES ONLY. PUBLIC ACCESS PROHIBITED.

Changes to security are expected to occur during the course of 241-Z deactivation and decommissioning activities. Security measures will remain in place that limit unit entry to authorized personnel and that preclude unknowing access by unauthorized individuals. The following describes the current security arrangement at PFP, for information purposes only. Hanford Patrol ensures the protection of special nuclear material at PFP. PFP currently has controlled areas within the boundary (Figure 2-2). The inner fenced area is termed a Protected Area. The 241-Z is located within this Protected Area.

The buildings are posted to allow entry by authorized personnel only and to identify hazards present by the building. To preclude access by unauthorized individuals, the 241-Z Building is controlled by lock and key.

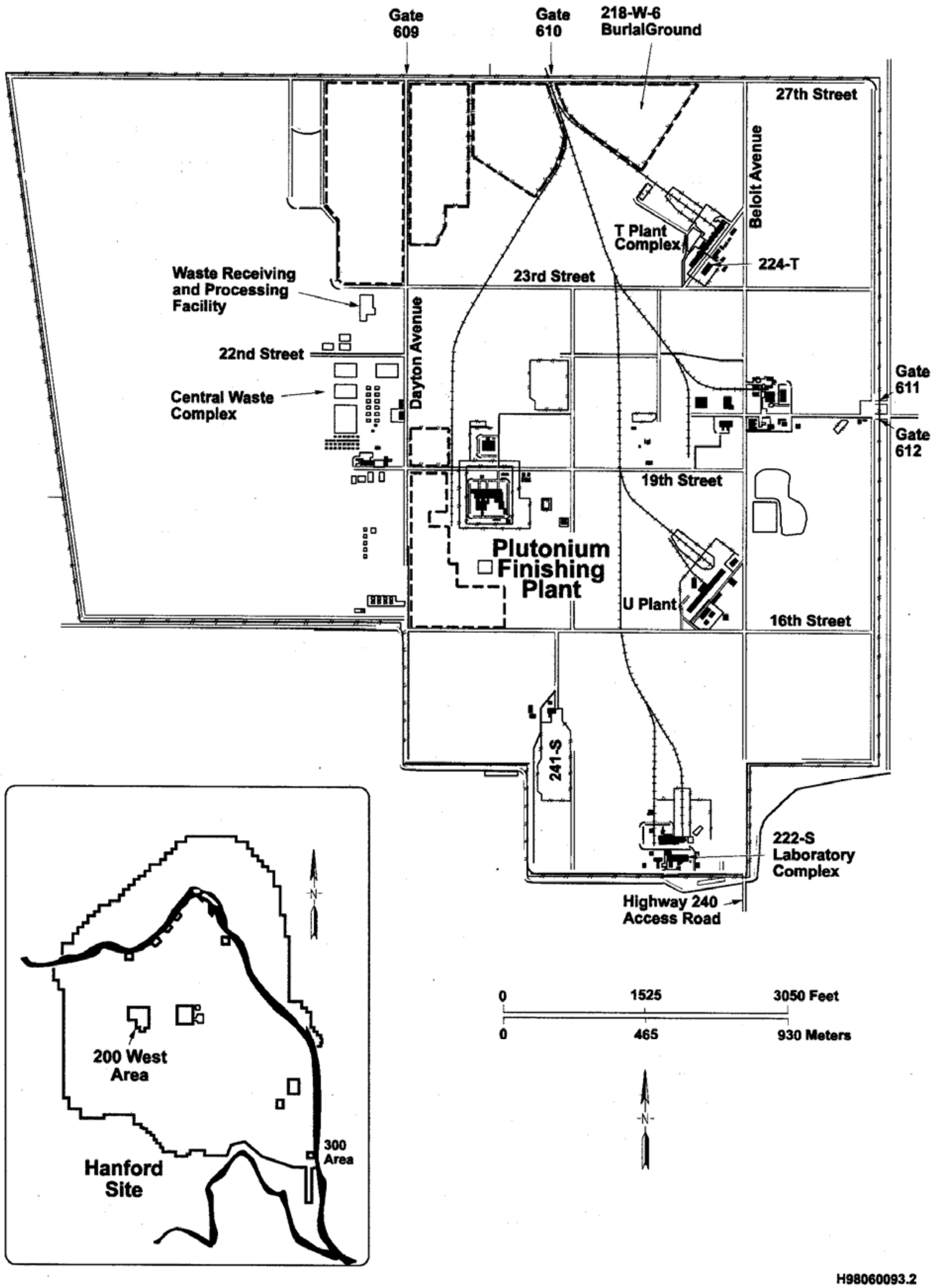


Figure 2-1. 200 West Area.

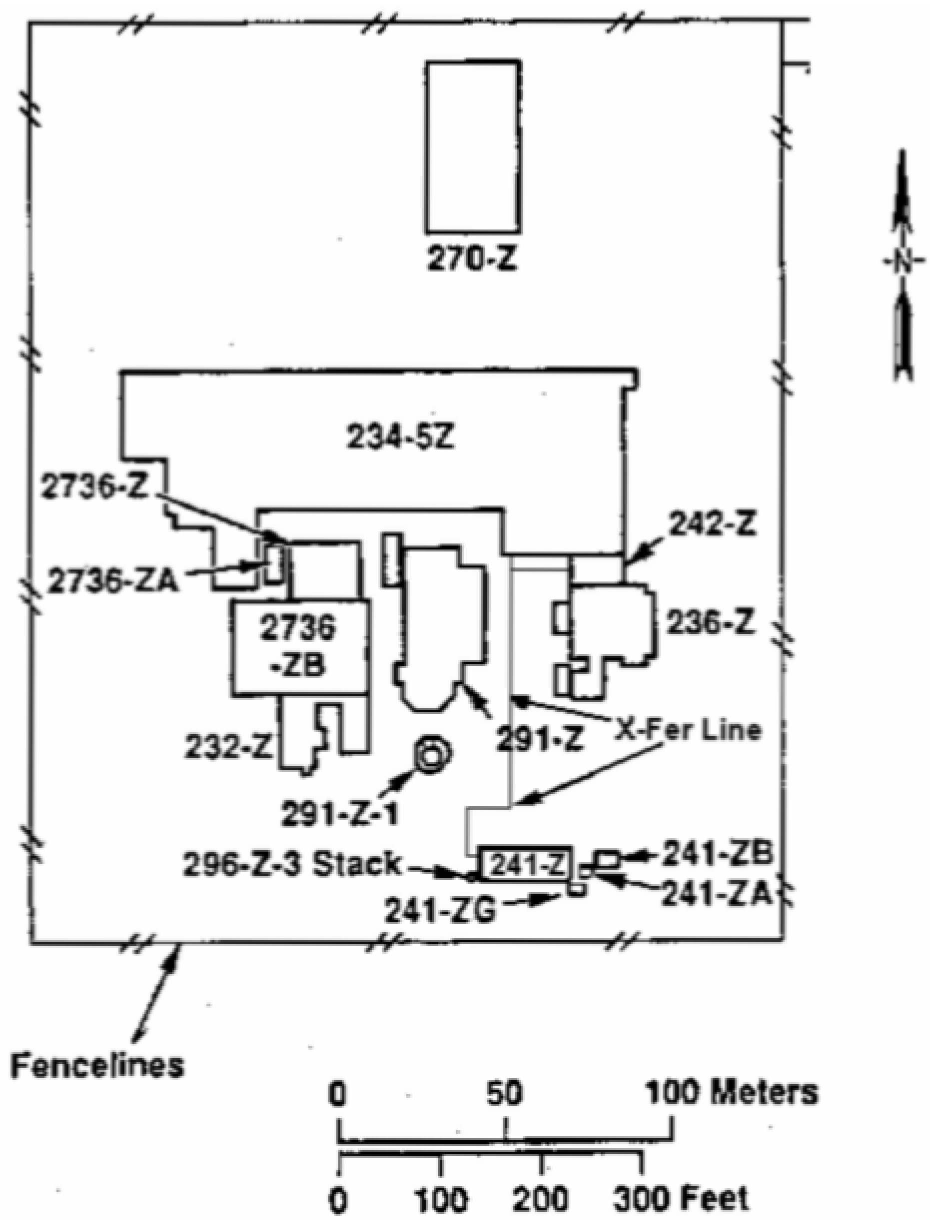
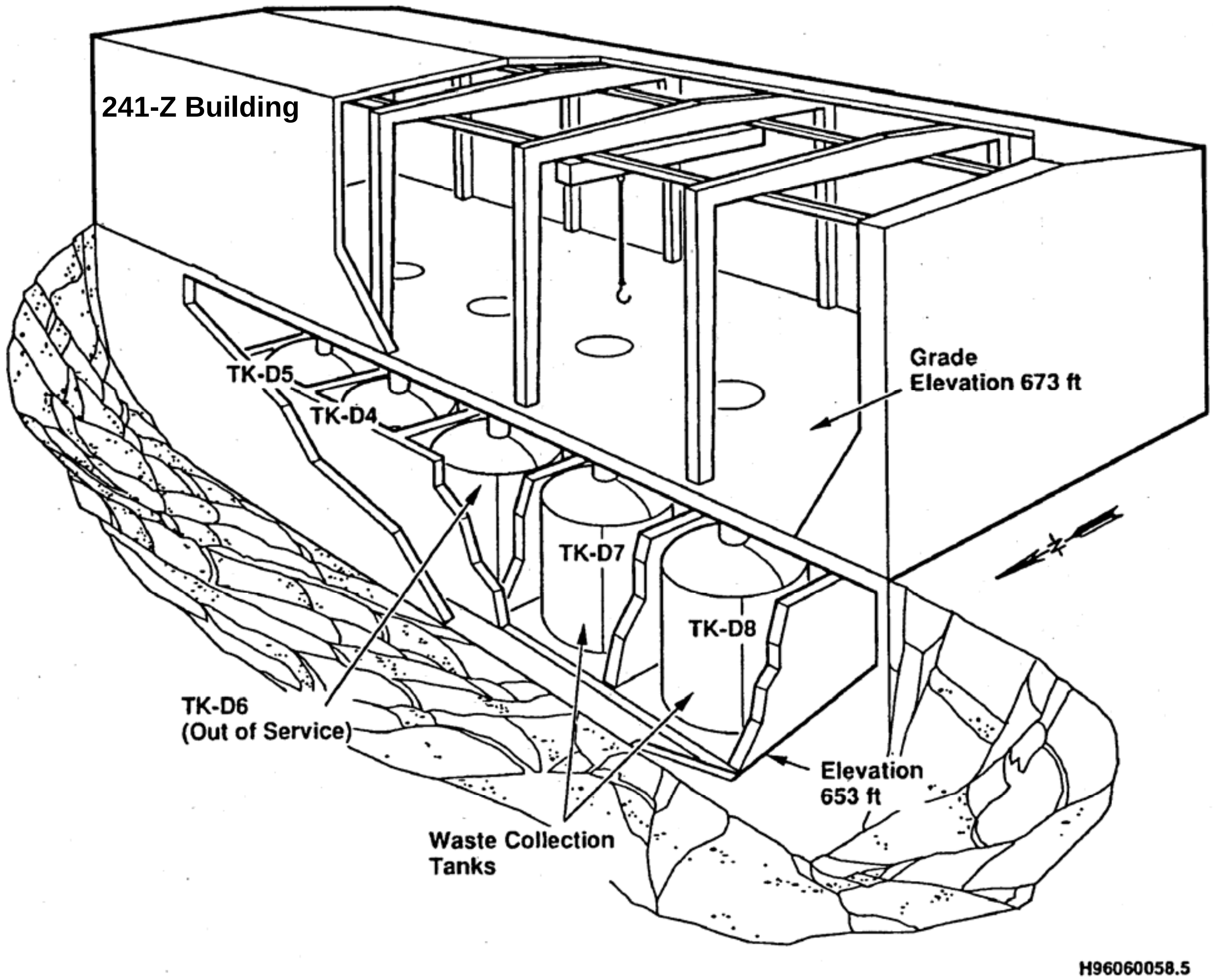


Figure 2-2. Plutonium Finishing Plant.



Note: TK-D4, TK-D5, TK-D7 and TK-D8 are the 241-Z TSD unit waste collection tanks. TK-D6 was removed from service prior to RCRA operations and is a past-practice tank that will be addressed outside the scope of TSD unit closure.

Figure 2-3. Cutaway View of 241-Z Tanks and the 241-Z Building.

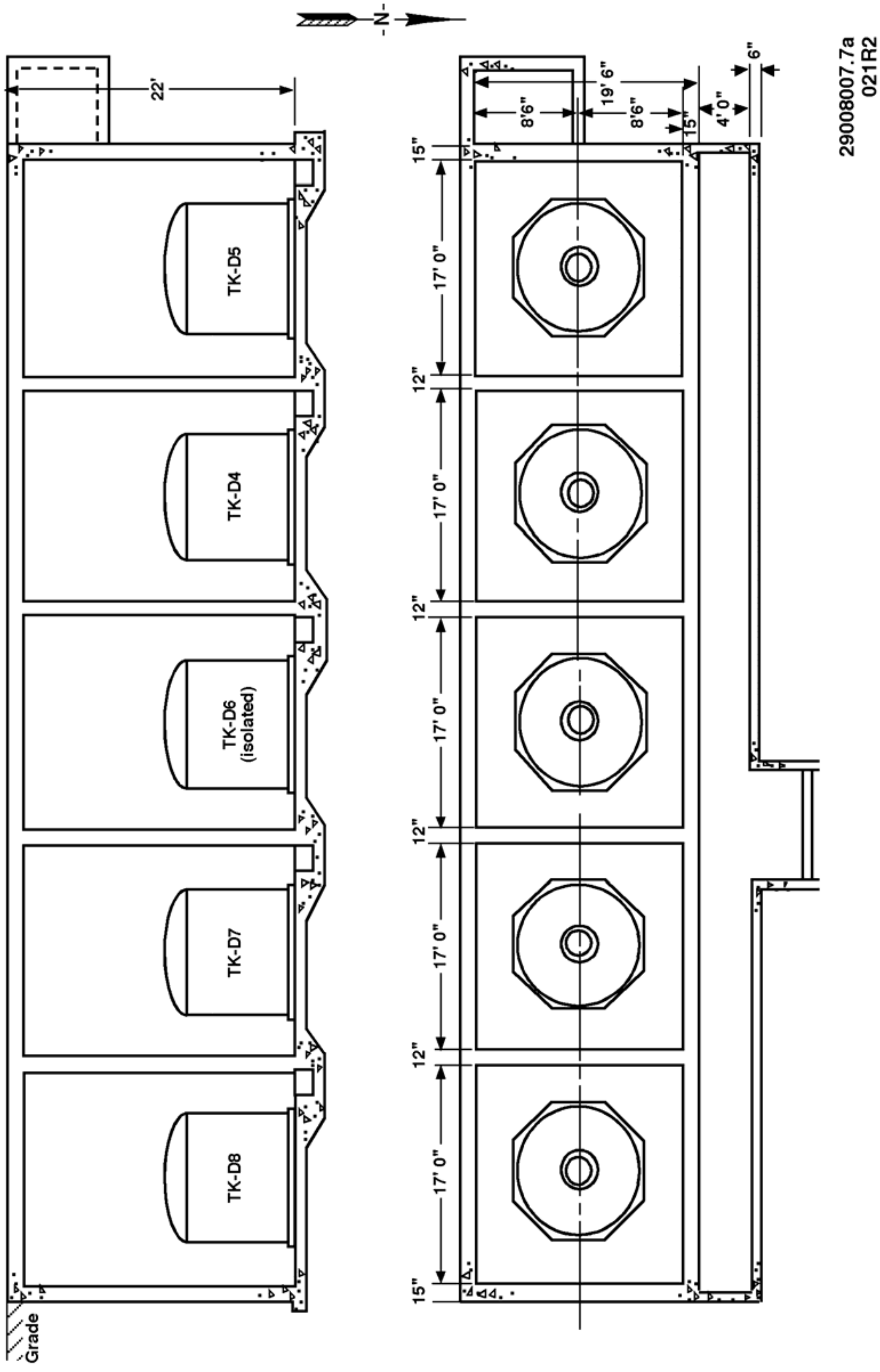


Figure 2-4. Layout of 241-Z Tanks, Vaults, and Sumps.

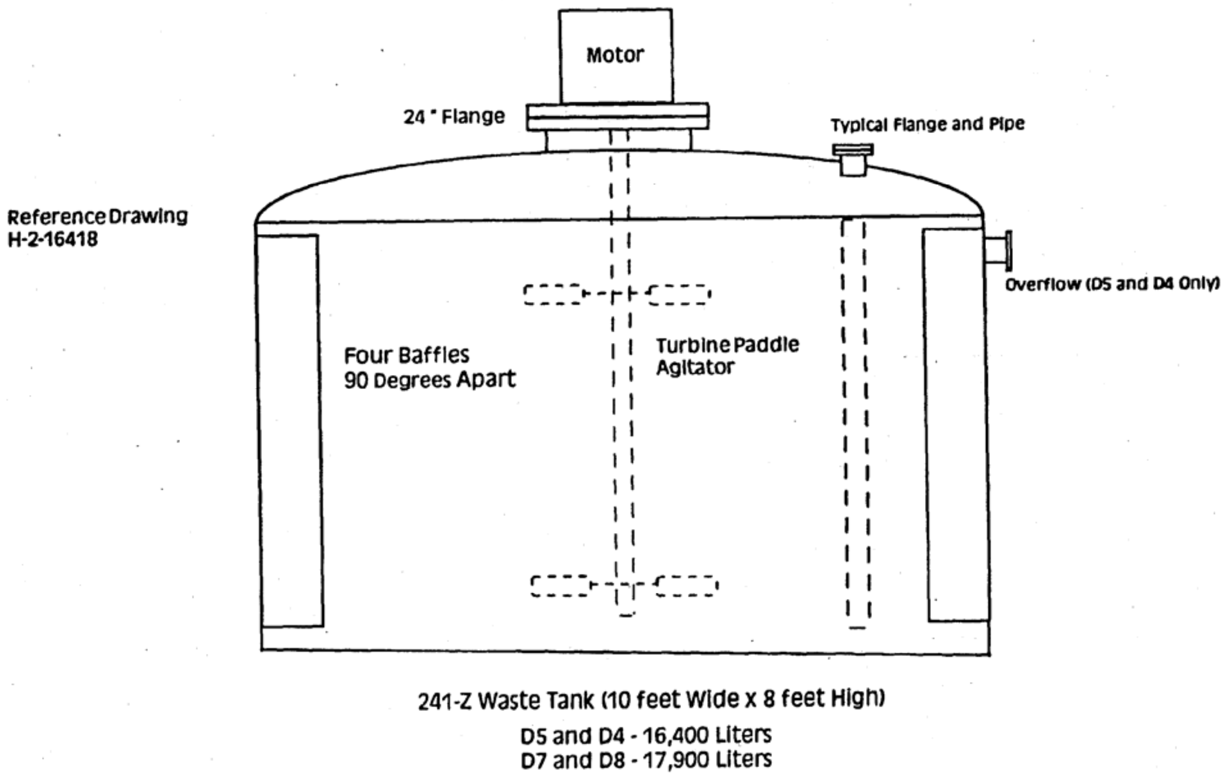
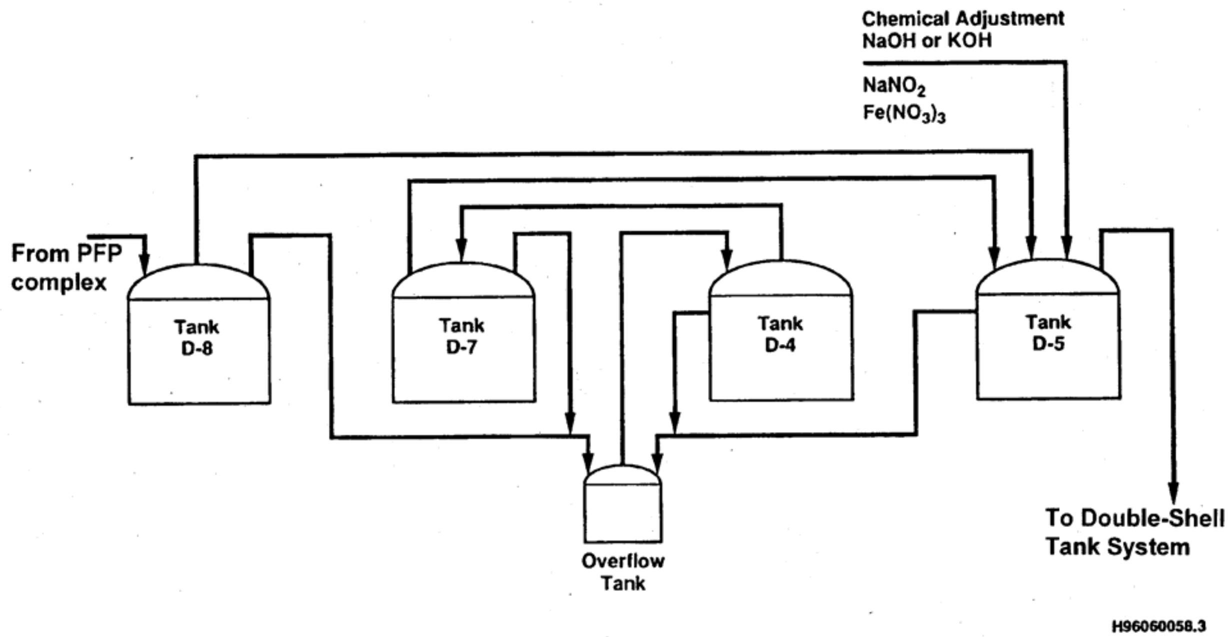


Figure 2-5. Typical Tank Diagram.



Note 1: Treatment in tank D-8 has not occurred.

Note 2: Sumps located in cells D-4, D-6, D-7, and D-8 discharge to tank D-4. Sump in cell D-5 discharges to tank D-5.

Figure 2-6. Schematic of 241-Z Treatment and Storage Tanks.

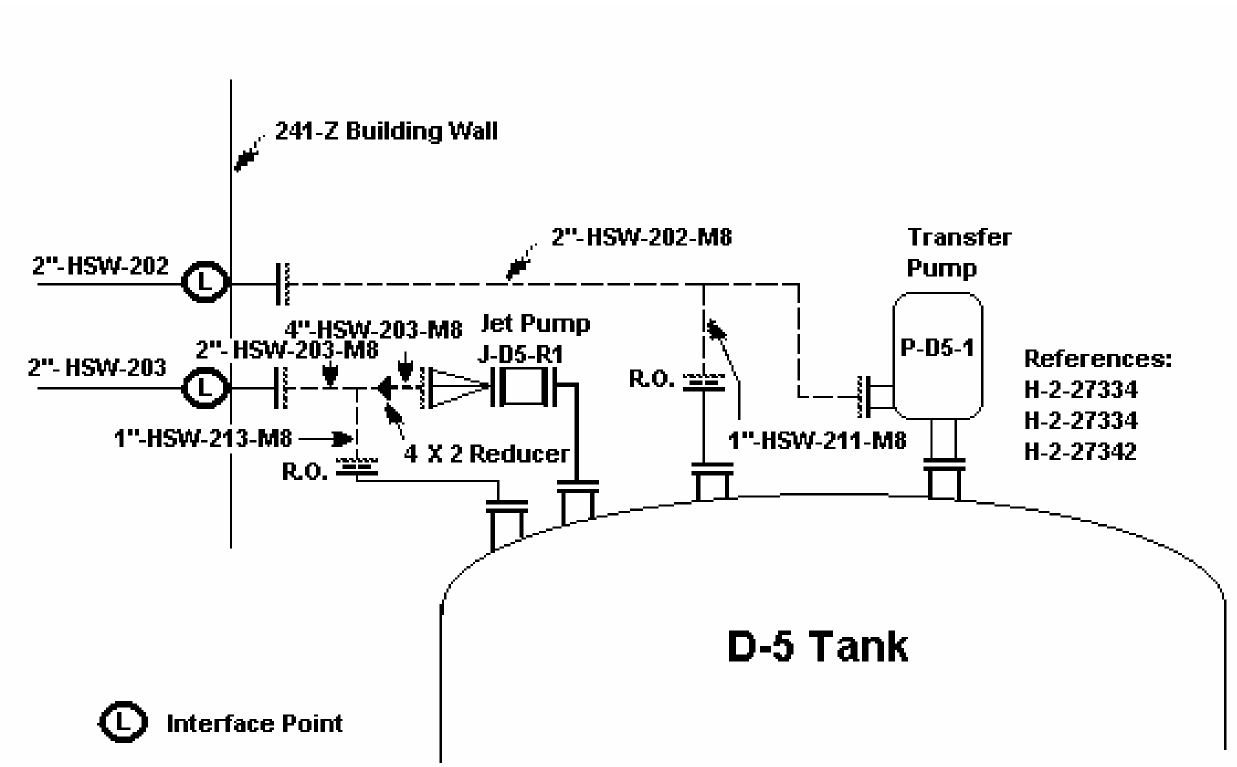
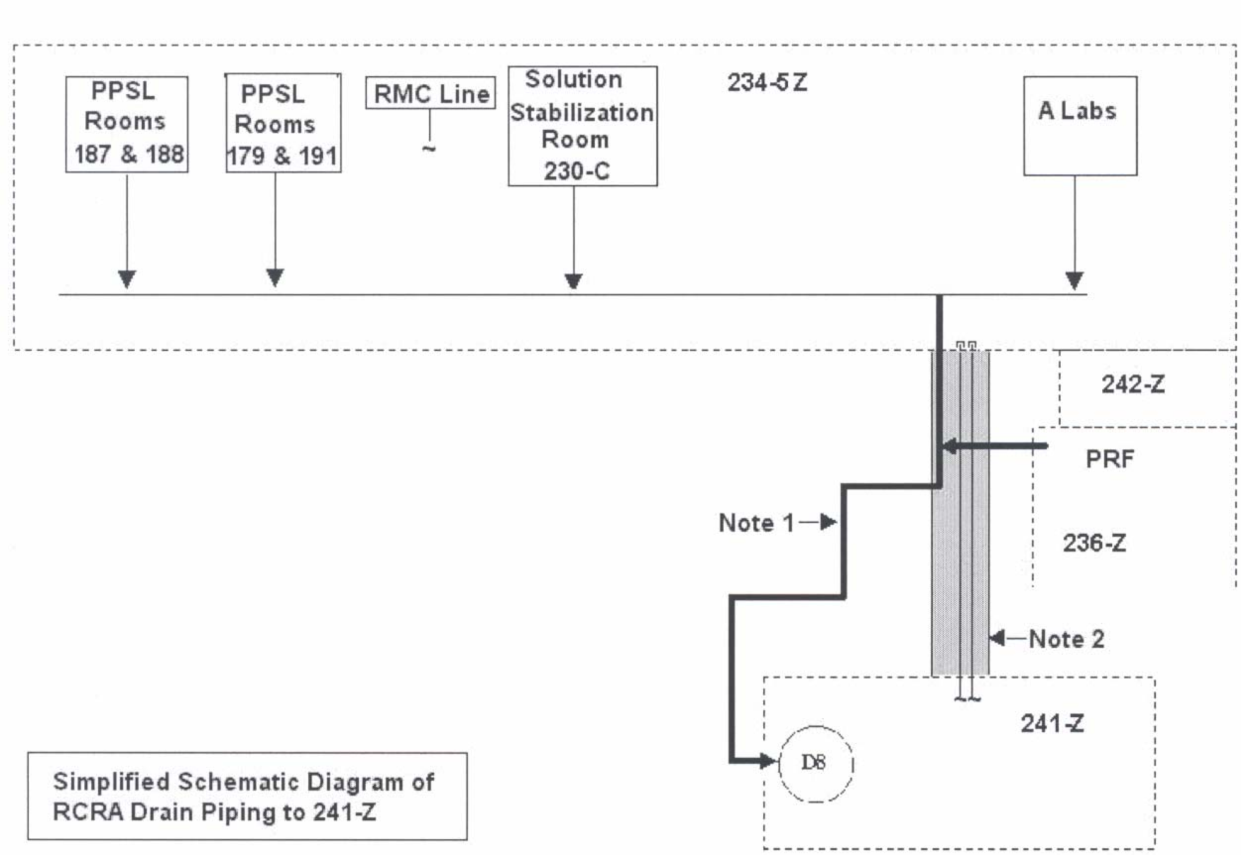


Figure 2-7. Tank D-5 Piping and Ancillary Equipment.



Note 1: Direct buried double-walled pipe (in service since 1994)

Note 2: Trench and single-walled pipes to tanks D-4, D-5, D-6, D-7, and D-8 (D-6 line failed in 1969, remaining piping was removed from service in 1994).

Figure 2-8. Schematic Diagram of 241-Z Waste Transfer Piping from PFP Sources

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Chapter 3.0 Process Information

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3.0 PROCESS INFORMATION

This chapter describes the processes that generated the waste received by 241-Z and the 241-Z treatment and storage processes.

3.1 PAST AND CURRENT PFP WASTE PRODUCING PROCESSES

All liquid mixed waste managed at 241-Z originates from PFP facilities. Dangerous waste streams that were discharged to 241-Z during the period of RCRA operations (since 1987) are identified by the salt concentration (high salt or low salt) and/or the process of origin as follows:

- High-salt waste (HSW) from Plutonium Reclamation Facility (PRF) (inactive since 1993)
- HSW from the remote mechanical C (RMC) line (inactive since 1989)
- Low-salt waste (LSW) from PFP laboratories, PRF, and RMC line
- Waste from precipitate process operations in Room 230C using magnesium hydroxide and oxalate to precipitate plutonium from nitric acid solutions from 1999 until 2002; solutions processed were similar to liquids historically processed in the PRF or RMC process
- Additional plutonium process waste from washing of impure plutonium solids (using the precipitation process operations equipment) that began in 2003 and will be completed in 2004.

3.1.1 Plutonium Reclamation Facility

The mission of the PRF, located in the 236-Z Building, was to recover and purify plutonium from aqueous feed to produce plutonium nitrate solution. The PRF began operation in 1964, shut down in 1979, restarted in 1984, and last operated in 1993 as part of a training campaign.

A liquid-liquid solvent extraction process was used at PRF to separate plutonium from dilute aqueous (water-based) solutions containing other various impurities to purify the extraction into a concentrated plutonium nitrate solution. A dense organic liquid consisting of tributyl phosphate and carbon tetrachloride (solvent) was passed through a less dense aqueous solution in the CA extraction column where the liquids picked up or adsorbed (extracted) specific substances from each other. To remove impurities from the solvent for reuse, the process was repeated in different extraction columns. Uranium was removed using the CU column. Dibutyl phosphate was removed using the CX column.

An evaporator was used to further concentrate the plutonium nitrate solutions to meet the RMC line feed specifications. Steam was supplied to the steam jacket surrounding the evaporator to heat the evaporator.

3.1.2 RMC Line

The RMC line, located in the 234-5Z Building, was used to convert plutonium nitrate solutions to plutonium metal. The RMC line started in 1959, shut down in 1973, restarted in 1985, and last operated in 1989.

Plutonium nitrate solution for the RMC line came from PRF or the Plutonium-Uranium Extraction (PUREX) Plant. The plutonium nitrate solution was fed from glass tanks into the RMC line where nitric acid and hydrogen peroxide were added to achieve a specific chemical composition. This adjusted feed stream was mixed with oxalic acid to precipitate plutonium oxalate into solid and liquid slurry. The slurry was vacuum filtered to remove the excess liquid (filtrate).

Potassium permanganate was added to the filtrate to partially destroy the remaining oxalic acid and the filtrate was added to the PRF filtrate evaporator to complete oxalic acid destruction. The distillate from the filtrate evaporator contained trace quantities of nitric acid and plutonium, which was discharged into tank D-4.

The plutonium oxalate solids were scraped from the vacuum filter into a heated screw calciner for conversion into plutonium oxide powder. The powder was reacted with hydrogen fluoride gas to convert the solids into plutonium fluoride powder. The unreacted hydrogen fluoride gas was scrubbed before discharge into the ventilation system using a concentrated potassium hydroxide liquid. The spent potassium hydroxide stream was discharged to tank D-8.

3.1.3 PFP Laboratories

The 234-5Z Building houses the PFP Analytical Engineering Laboratory (AEL) and the Plutonium Process Support Laboratory (PPSL). The AEL performs analytical measurements in support of PFP operations. The PPSL performs process development studies at PFP, such as plutonium stabilization methods. Liquid waste from the laboratories is transferred to 241-Z.

3.1.4 Precipitate Process Operations

The solutions processing equipment located in Room 230C of the 234-5 Z Building uses magnesium hydroxide or oxalate as a precipitating agent to facilitate removal of the plutonium from the solutions for stabilization and packaging. The filtrate and flush water are discharged to tank D-8.

3.1.5 Plutonium Stabilization Activities

The solutions processing equipment located in Room 230C is currently being used to support washing of certain salt contaminated plutonium solids (Chloride Wash campaign). Minor modifications to the solutions process equipment originally used for the magnesium hydroxide and oxalate precipitation process were made to accommodate this feed stream. Waste liquid from this process will be discharged to tank D-8.

3.2 TANK STORAGE AND TREATMENT PROCESSES

Before 1994, various PFP waste streams were transferred directly to tanks D-4, D-5, or D-8. Following upgrades to the system in 1994, only one new double-walled transfer line to tank D-8 from the 234-5Z building has been used. However, waste can be transferred within the system as depicted in Figure 2-5.

From tank D-8, the waste is transferred to tank D-5 for treatment as necessary before transfer to the DST System. Waste treatment in the tank system consists of adding sodium or potassium hydroxide to adjust pH, so the waste is less corrosive to carbon steel. Waste is brought to an excess hydroxide condition. Sodium nitrite is added to further inhibit corrosion. Ferric nitrate is added to form a stable solid particulate to provide favorable spacing of plutonium in larger tanks. Similar treatment is allowed in tank D-8, but to date has not occurred.

3.3 DOCUMENTED TSD AND CERCLA PAST-PRACTICE TANK D-6 OPERATIONAL EVENTS

This section identifies documented TSD unit and past-practice operational events.

3.3.1 TSD Unit Operational Events

In March 1991, an operational event resulted in an overflow of water into the D-5 and D-4 vaults. It is estimated that approximately 26,000 liters of water were transferred inadvertently to the tanks during a PRF maintenance outage. The top mounted flanges on tanks D-4 and D-5 leaked after water backed up the overflow tank drain line, thereby allowing water to overflow into the vaults. The sump alarms went off. The liquid was transferred back into the tanks and later transferred to the DST System. While there was standing water in the vault, the water level did not decrease noticeably, indicating that the concrete vault cells effectively contained the spills.

In March 2002, a leak in the system piping that resulted in liquid leaking into the D-8 vault was identified. While investigating higher than normal plutonium assay results associated with tank D-8, a portion of ancillary piping was observed leaking. A cell entry was made and a determination made that a drain line connected to the main drain line from 234-5Z to tank D-8 had failed, resulting in a minor release of liquids (approximately 1 liter) to the tank cell. The spill was cleaned up and the line was replaced.

3.3.2 Past-Practice (Pre-RCRA) Events

The two significant documented past-practice events are the failure of the D-6 drain line from 234-5Z structures to the 241-Z in April of 1971 (UPR-200-W-103) and the failure of tank D-6 in 1972 that spilled tank waste to the cell. The D-6 system was taken out of service after the 1972 failure and never was part of the RCRA permitted system.

Because tanks D-4, D-5, D-7, and D-8 operated for almost 40 years before being permitted, process upsets similar to those described in this plan could have occurred that were not documented, or the documentation is not available. Because of the potential for undocumented tank overflows and piping failures, tank exteriors are presumed to have contacted mixed waste contaminants similar to contaminants found in current waste streams.

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Chapter 4.0 Waste Characteristics

Tables

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4.0 WASTE CHARACTERISTICS

This chapter discusses the inventory and the characteristics of the waste treated and stored at 241-Z during RCRA operations.

4.1 ESTIMATE OF MAXIMUM INVENTORY OF WASTE

The maximum estimated inventory of waste stored in 241-Z at one time is calculated on the basis that tanks D-4, D-5, D-7, and D-8 are filled to design capacity. These volumes do not include tank D-6 or the D-7 cell overflow tank. Because the overflow tank is identified in the 241-Z Part A, Form 3, as a temporary holding tank, and not a dangerous waste storage, its volume is not considered here. The tank volumes at the overflow level are as follows: (1) D-8, 17,900 liters; (2) D-5, 16,400 liters; (3) D-4, 16,400 liters; and (4) D-7, 17,900 liters, for a total of 68,600 liters.

4.2 WASTE CHARACTERISTICS

The PRF and the RMC lines no longer operate and therefore no longer contribute waste to the 241-Z. However, waste constituents from processes occurring at these locations could still remain in the tank system, and so the characteristics of the waste generated by these processes are described in the following sections.

4.2.1 PRF Waste Streams

The waste solutions generated by the PRF and transferred to 241-Z were a mixture of high salt waste (HSW) and low salt waste (LSW), as described in the following sections.

4.2.1.1 PRF High Salt Waste

HSW was generated by a solvent extraction process that involved and aqueous feed stream containing plutonium and some impurities that was interacted with an organic solution in pulse columns to recover plutonium from the aqueous stream. The organic solution used carbon tetrachloride as a diluent and fire suppressant and not for its solvent properties. The HSW consisted of the column aqueous waste (CAW) stream and two waste streams comprised of organic cleanup waste. The CAW stream was highly acidic waste from the CA column. The feed stream into the column typically was characterized only with respect to plutonium content. The two solvent cleanup waste streams generated during the organic cleanup phase were the CU column waste stream (CUU) and CX column waste stream (CXP). The CUU consisted of the aqueous waste from the uranium removal CU column and contained trace levels of fluoride and chloride and high levels of uranium. The CXP consisted of aqueous waste from the dibutyl phosphate removal CX column, and was a carbonate solution that contained the organic degradation product sodium dibutyl phosphate.

The combined CAW, CUU, and CXP were collected in tank D-8 and transferred to tank D-5 for pH adjustment to a final caustic condition by the addition of sodium hydroxide. Ferric nitrate and sodium nitrite also were added to the waste before transfer to the DST System.

These processes separated impurities, many of which are RCRA heavy metal contaminants, from the plutonium that remained in the aqueous waste discharged to the 241-Z. Additionally, the waste contained carbon tetrachloride because of direct contact of aqueous and organic phase solutions. The PRF HSW was a RCRA characteristic waste for corrosivity because the waste was acidic before treatment for transfer to the DST System and for toxicity because the waste contained residual heavy metal contaminates and carbon tetrachloride.

4.2.1.2 PRF Low Salt Waste

The remaining waste streams were consisting of LSW filtrate concentrator distillate and steam condensate from the filtrate and product evaporators. The evaporator distillate normally contained nitric acid and trace plutonium, but small concentrations of fluoride and chloride might have been present. The steam condensate normally was only water and scale inhibitor.

These waste streams were piped to tank D-4 and assayed in tank D-7. The waste usually was transferred to tank D-5 where the waste was combined with HSW from tank D-8 for pH adjustment to a caustic condition before transfer to the DST System. Batches that did not contain HSW also could have been pH adjusted to a caustic condition for transfer to the DST System.

4.2.2 RMC Line Waste Streams

Remote mechanical C (RMC) line operation waste that was transferred to 241-Z came from the potassium hydroxide scrubber located in the 234-5Z Building and from the filtrate evaporator located in the 236-Z Building. The potassium hydroxide scrubber solution generated a HSW stream that contained potassium fluoride and potassium hydroxide. The filtrate evaporator generated a LSW stream that had higher volume and lower acidity than the LSW stream generated by PRF. Although the bulk components of the RMC line LSW were the same as PRF LSW, the trace constituents were different. The RMC line last operated in 1989 and this portion of the piping system that serviced the scrubber was removed from service in 1994.

The RMC line HSW was collected in tank D-8 and, when necessary, transferred to tank D-5 for transfer to the DST System. The waste was highly caustic and no caustic addition was required before transfer.

The RMC line LSW, like PRF LSW, was collected in tank D-4 and stored in tank D-7. These solutions were slightly acidic and required treatment by pH adjustment to a caustic condition before transfer to the DST System.

4.2.3 Laboratory and Miscellaneous Operations Waste

The PFP AEL and the PPSL generate LSW containing acids, bases, and trace amounts of plutonium and other contaminants such as metals. This stream is routed to tank D-8 where the liquids are transferred to tank D-5, treated with caustic to 0.5 M excess hydroxide, and transferred to the DST System.

4.2.4 New Waste Streams from Transition Activities

Waste streams from the PFP solutions stabilization and deactivation activities contain magnesium hydroxide; oxalate; trace plutonium; and metals, such as silver, lead, barium, and chromium. Additional waste from decontamination activities and some additional stabilization activities are anticipated.

4.2.5 Waste Summary

Table 4-1 summarizes the past waste compositions contributed by the various streams. This information is a combination of historical sample data and chemical material balances.

Table 4-2 summarizes the composition of anticipated waste streams from PFP developmental laboratory operations.

The Part A, Form 3, defines 241-Z waste as a potential characteristic mixed waste for corrosivity and toxicity. Waste received by the tanks was potentially a corrosive characteristic waste (D002) due to the presence of nitric acid and this waste would have remained corrosive after treatment in the tank system by the addition of sodium hydroxide. The waste was potentially a toxicity characteristic waste due to the presence of arsenic (D004), barium (D005), cadmium (D006), chromium (D007), lead (D008), mercury (D009), selenium (D010), silver (D011) and carbon tetrachloride (D019). These contaminants represent the potential constituents of concern in waste residues remaining on unit structures and components.

Lead, chromium, and carbon tetrachloride are PRF process waste constituents that historically have been present in the waste stream at concentrations well above regulatory levels. Arsenic, barium, chromium, lead, silver, mercury, and selenium were not process constituents (Table 4-1 or Table 4-2) and have historically been detected in the waste stream only slightly above regulatory levels. These non-process constituents entered the waste stream either by leaching from piping (e.g., chromium) or as minor contaminants in the feed stream.

As part of PFP transition activities (solution stabilization and chloride salt material processing), liquids have and will continue to be generated that can be anticipated to contain varying concentrations of the heavy metals listed in the Part A, Form 3 (arsenic, barium, chromium, lead, silver, mercury, and selenium).

Table 4-1. Past Waste Characterization of PFP Waste Transferred to the 241-Z (concentrations are listed in parts per million).

Species	Plutonium Reclamation Facility					Remote Mechanical C		Laboratories
	CAW	CAW Range*	CXP	CUU	LSW	HSW	LSW	
Ag	---	---	---	---	---	---	---	10
Ba	1	---	0	0	1	0	0	0
Ca	50	---	1	0	6	0	2	0
Cr	70	10-100	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
H	2,000	2,000-3,000	0	400	2.000	0	800	100
Pb	90	---	0	0	0	0	0	0
OH^-	0	---	80	0	0	30,000	0	0
CCl_4	600	---	700	700	300	0	0	0

* Waste concentrations show a range because of variations in the PRF process used to accommodate variations in the PRF feed.

CAW = column aqueous waste
CXP = CX column waste stream
CUU = CU column waste stream
HSW = high-salt waste
LSW = low-salt waste

Table 4-2. 241-Z Waste Composition Associated with Laboratory Operations (ppm).

Species	Vertical calciner	Ion exchange	Flushing	Laboratories
Ag	10-100	---	---	0-10
Ba	10-100	---	---	---
Cr	---	10-100	10-100	10-100
Fe	---	10-100	10-100	10-100
Pb	10-100	---	---	---

ppm = parts per million.

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Chapter 5.0 Groundwater Monitoring

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5.0 GROUNDWATER MONITORING

The 241-Z is not a regulated unit under the definitions of WAC 173-303-040 (i.e., surface impoundment, waste pile, land treatment unit, landfill) that would require groundwater monitoring. Therefore, a groundwater monitoring program in accordance with WAC 173-303-645 is not a requirement of operations.

This closure plan anticipates clean closure of TSD unit soil, and therefore of groundwater with regard to contamination from TSD unit operations. If TSD unit soil can not clean close under this plan, remaining soil contamination would be evaluated and dispositioned by the appropriate future CERCLA response action. As described in Chapter 7.0, Section 7.2.5, while awaiting CERCLA disposition, steps would be taken as required by WAC 173-303-610 (4)(b) to prevent threats to human health and the environment from the unclosed portions of the unit that would be considered potential impacts to the environment, including groundwater. If CERCLA activities do not achieve clean closure of TSD unit soil, a postclosure plan would be developed addressing potential groundwater monitoring. The 241-Z is within the 200-ZP-1 (groundwater) Operable Unit (OU) as designated in the TPA and any groundwater monitoring or remediation would occur under the CERCLA remedial investigation/feasibility study (RI/FS) process for this OU, outside the scope of this closure plan.

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Chapter 6.0 Closure Strategy and Performance Standards

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6.0 CLOSURE STRATEGY AND PERFORMANCE STANDARDS

This chapter describes 241-Z closure strategy and closure performance standards.

6.1 CLOSURE STRATEGY

The 241-Z will be clean closed with respect to dangerous waste contamination from RCRA operations to the extent practicable after completion of closure activities identified in this plan. Incidental cleanup of non-RCRA components (e.g., tanks D-6, D-9, D-10, and D-11) and structures (e.g., D-6 vault cell) are planned to occur in conjunction with tank system closure activities but remain outside the scope of this plan. Potential past-practice contamination existing in the adjacent D-6 vault or emanating from documented spills to the D-6 vault is considered CERCLA-only contamination that has been identified in Waste Information Data System (WIDS) for tracking to disposition by the appropriate CERCLA action(s) outside the scope of 241-Z TSD unit closure.

All components, structures, and soil that meet clean closure standards identified in this plan will be clean closed. If 241-Z in its entirety can not be clean closed under this plan, the unit will remain unclosed and enter an extended closure period. For an extended closure period, steps will be taken as described in Section 7.2.5 in coordination with PFP surveillance and maintenance activities, to prevent threats from the not operating but unclosed unit. The 241-Z Part A, Form 3, would be modified to remove clean closed portions from the TSD unit description and identify unclosed portions for tracking until final closure. Remaining contamination also would be identified in WIDS for tracking to final disposition. Concrete surfaces over unclosed soil (if any) would remain in place until the time of final soil disposition. Final 241-Z closure would occur after disposition of any remaining TSD unit contamination in conjunction with the future CERCLA Removal Action [e.g., engineering evaluation/cost analysis (EE/CA)] that includes 241-Z structures and/or the CERCLA Remedial Action that includes 241-Z soil. Extension of the closure period beyond 180 days and integration of closure with CERCLA action(s) in this manner are acceptable for reasons described in Chapter 1.0.

6.2 CLOSURE PERFORMANCE STANDARDS

Clean closure, as defined in the HF RCRA Permit, Section II.K.1 and as provided in this plan, will meet the closure performance standards of WAC 173-303-610 (2)(a) by eliminating future maintenance and by removing or reducing chemical contamination at the 241-Z to levels that eliminate the threat of postclosure contaminant escape as necessary to protect human health and the environment. Clean closure will be achieved when all unit dangerous waste, waste residue, or contaminated equipment and soil are removed or decontaminated to the visual or analytical clean closure performance standards identified in this plan and established in accordance with WAC 173-303-610(2)(b). After closure, appearance of the land will be consistent with future land use determinations for adjacent portions of the 200 Areas. Clean closed tanks and vault cells could remain until disposition in conjunction with future PFP decommissioning activities.

6.2.1 Clean Closure Standards for Structures and Components

Tank system structures and components will be clean closed by removal or by meeting the approved visual and/or analytical clean closure standard(s) established in accordance with WAC 173-303-610(2)(b)(ii) and identified in the following sections. These standards can be used interchangeably. Based on conditions encountered at the time of closure, management will determine which approved method (visual inspections or analytical sampling and analysis) will be used to verify clean closure of structures and components and the performance standard that must be met.

6.2.1.1 Visual Performance Standard: Clean Debris Surface

Clean closure of metal and concrete materials can be achieved by meeting the visually verifiable performance standard of a 'clean debris surface'. This is the visual performance standard for alternative treatment of hazardous debris identified in 40 CFR 268.45, Table 1. "A clean debris surface means the surface, when viewed without magnification, shall be free of all visible contaminated soil and dangerous waste, except that residual staining from soil and waste consisting of light shadows, slight streaks, and minor discoloration; and soil and waste in cracks, crevices, and pits shall be limited to no more that 5 percent of each square inch of surface area" (40 CFR 268.45). 241-Z material meeting this standard would not designate as hazardous debris and can be clean closed without further action.

6.2.1.2 Analytical Performance Standards: Health-Based Levels and Dangerous Waste Designation Levels

Materials that do not meet the visual clean debris surface standard or to which the visual standard will not be applied (e.g., inaccessible pipe internal surfaces), will be clean closed by sampling and analysis instead of through visual inspections. Clean closure of structures and components could be verified by sampling of flush solutions or decontamination rinsate; by wipe sampling of non-porous metal or painted concrete surfaces; or, by chip sampling of bare concrete. The material would qualify for clean closure if concentrations of dangerous waste constituents of concern (Chapter 7.0, Section 7.1.4) are below WAC 173-303-090 designation levels for toxicity characteristic dangerous waste and if the material does not exhibit the WAC 173-303-090 characteristic of corrosivity.

When a sample is analyzed by totals analysis and the presence of radionuclides or other constituents in the sample matrix adversely impact detection limit(s), a non-carcinogen 'health-based' action level for soil prescribed by WAC 173-303-610(2)(b)(i) will be used as the analytical clean closure standard for the material.

6.2.2 Closure Standards for Underlying Soil

The concrete vault cells housing the tanks constitute a system to contain leaks or spills and prevent these from reaching soil. Soil will be clean closed by visually verifying that the vault cells remained intact and kept contaminants from reaching soil. Concrete surfaces will be inspected for through-thickness cracks that, if existing, could have provided a pathway to soil for contamination. If such cracks are not identified, the soil will be clean closed.

If inspections identify such cracks and further investigation (Chapter 7.0, Section 7.2.4) identifies a potential for soil contamination, the condition will be documented in the 241-Z TSD unit closure log. The unit will enter an approved, extended closure period as indicated in Section 6.1, the conditions of which are further described in Section 7.2.5. Potential soil contamination will be investigated and dispositioned in conjunction with the appropriate CERCLA action (Section 6.1). The CERCLA action will identify through approved sampling and analysis concentrations of 241-Z contaminants of concern in TSD unit soils, so that the appropriate TSD unit closure level (i.e., clean, modified, or landfill closure) in accordance with WAC 173-303-610 (2)(b)(i) and/or Section II.K of the HF RCRA Permit can be identified.

Chapter 7.0 Closure Activities

Figures

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7.0 CLOSURE ACTIVITIES

This section identifies the activities that will be performed to implement and verify clean closure of the 241-Z.

7.1 INTRODUCTION

The 241-Z will operate in support of PFP complex decommissioning activities up to the time of tank system closure. The scope of physical closure activities is tied closely to the scope of 'terminal cleanout' activities required to reduce plutonium contamination in the tank system and to meet TPA Milestone M-83-31 to discontinue discharges to the DST. Terminal cleanout activities are the deactivation activities associated with reduction of facility radiological contamination in preparation for facility shutdown and demolition in conjunction with the M-83 series of TPA milestones for disposition of the PFP complex. For purposes of TSD unit closure, these activities include removal of tank waste inventory; removal of selected piping and ancillary equipment; cleanup of tanks, remaining equipment, and vault cells; and inspections and/or sampling to determine if these activities meet clean closure levels for unit components, structures, and soil. Significant removal actions are not anticipated under this plan. If the entire unit can not be clean closed, the activities performed under this plan will leave the unclosed tank system materials in place and in a safe and stable condition while awaiting final closure in conjunction with the appropriate future CERCLA action(s) (Chapter 6.0, Section 6.1).

The following summarizes the general closure activities identified in this chapter.

- Remove and dispose of waste inventory in tanks.
- Perform initial structure and component inspections and document:
  - Material that meets the visual clean closure standard (clean debris surface) without further action
  - Material requiring removal or decontamination for clean closure
  - Significant cracks or openings in containment structures that could have provided a contaminant pathway to soil during operations or that could allow the escape of decontamination solutions during closure. If none, clean close soil and/or perform decontamination activities as necessary.
- Remove selected ancillary equipment for disposal. Remove other components, as necessary, to gain access to tank system components for inspection or decontamination.
- Investigate significant cracks or openings in containment structures to determine if these penetrated the full thickness of the concrete and if so, whether a potential for soil contamination exists. If no potential for soil contamination exists, clean close the soil.
- Decontaminate concrete cell surfaces and internal surfaces and potentially contaminated external surfaces of tanks, piping, equipment, and to a clean debris surface by flushing and/or approved cleaning methods.
- Visually inspect decontaminated surfaces for a clean debris surface or sample surfaces, flush solutions or decontamination rinsate and compare results to analytical clean closure levels.
- Decontaminate or dispose of closure waste and equipment.
- Certify that closure activities were completed in accordance with the approved closure plan.

7.1.1 Removal of Waste Inventory

Removal of tank waste inventory will be completed after receipt of the final volume of waste from PFP operations, which could occur as late as June 2005 (Chapter 1.0). At that time, tank waste inventory will be transferred to the DST System consistent with previous waste transfers and with onsite procedures. No new waste will be added after this date.

7.1.2 Field Documentation

Personnel conducting decontamination and inspections will maintain an official logbook. The field logbook will be bound and have consecutively numbered pages. All information pertinent to the activities will be recorded in the logbook in a legible fashion. The field logbook will be reviewed and signed or initialed by the person in charge on days when work is performed. If changes are necessary, the changes will be indicated by a single line drawn through the affected text. The individual responsible for the change will initial and date the entry. The logbook will be protected, stored in a safe file or other repository, and kept as a permanent record. Copies of the field logbook will be made available to Ecology on request.

Decontamination and Verification checklists (Figure 7-1) will be initiated to verify performance of field decontamination, inspection, and/or sampling activities. Copies of completed checklist(s) will be maintained as a portion of the permanent closure record and filed in the Hanford Facility Operating Record.

7.1.3 Designation and Disposal of Material Removed During Closure

Designation of closure waste and debris will meet the requirements of WAC 173-303. The land disposal restriction (LDR) notification and certification requirements of WAC 173-303-140 and all applicable requirements will be met. Designation of waste generated during closure activities will be based on process knowledge and sampling as required.

Closure waste and debris will be accumulated in satellite accumulation areas at appropriate locations at the unit in accordance with WAC 173-303-200 while awaiting designation and transfer to a storage or disposal unit. Containers used for transfer of regulated materials will be U.S. Department of Transportation-approved containers compatible with the waste. The containers will be labeled and appropriate waste acceptance documentation completed for the receiving unit.

Because this unit managed radioactive waste, all waste will be radioactive or mixed. After designation, waste will be managed as follows.

- Low-level waste will be disposed onsite in the Low-Level Burial Grounds.
- Non-liquid mixed waste, if any, will be designated, containerized, and transferred to the Central Waste Complex for storage to await further treatment before final disposal.
- Non-liquid transuranic waste and mixed transuranic waste, if any, would be transferred to the Central Waste Complex for storage to await transfer offsite to the Waste Isolation Pilot Plant for disposal.
- Liquid mixed waste inventory and rinsate or flush solutions generated during closure will be transferred to the DST System for storage until final disposition.

Waste that is generated as a portion of a CERCLA removal or remedial action is CERCLA remediation waste that can be disposed onsite at the Environmental Restoration Disposal Facility.

7.1.4 Closure Verification Sampling

Verification of clean closure for some 241-Z materials not closed to visual standards could be achieved by laboratory sampling and analysis of material surface(s) or of rinse or flush solutions (Chapter 6.0, Section 6.2.1.2). Sampling would be used to verify that the concentration of constituents of concern applicable to the material being sampled are below analytical clean closure levels. Sampling would be in accordance with an approved sampling and analysis plan (SAP) that would evolve from a data quality objectives (DQO) process involving the permittee(s) and Ecology. The SAP would identify target analytes based on waste information provided in Chapter 4.0 and would document the number of samples, type and quality of data, sampling and analytical procedures, and the appropriate field and laboratory quality control.

7.2 CLOSURE ACTIVITIES

This section identifies the physical activities for clean closure of 241-Z tanks, piping, ancillary equipment, concrete containment cells, and soil directly beneath the cells. Past-practice tank D-6, cell D-6, and soil beneath the cell will be dispositioned outside the scope of TSD unit closure (Chapter 6.0, Section 6.1).

Access to locations undergoing closure will be controlled during the closure period. Access will be limited to personnel required to support unit closure activities. All closure activities will be performed to keep personnel exposure as low as reasonably achievable (ALARA). Radiation surveys and/or chemical field screening could be used to assist locating contamination.

7.2.1 Tank Closure Activities

The 241-Z tanks will not be removed under this plan. Tanks D-4, D-5, D-7, D-8, and the overflow tank in the D-7 cell will be clean closed in place or will remain in place for disposition and final closure in conjunction with the future CERCLA response action that includes 241-Z structures. Interior and exterior surfaces of the same tank will be clean closed using any approved closure decontamination method and/or performance standard (i.e., analytical or visual) identified in this plan. However, tank system components can not be clean closed until all surfaces of the component are clearly documented to have met an approved clean closure standard.

7.2.1.1 Closure of Tank Internal Surfaces

After removal of tank waste inventory (Section 7.1.1), mixed waste residues could remain inside the tanks, such as along side baffles or agitators. The internal surfaces of tanks D-4, D-5, D-7, D-8, and the overflow tank will be cleaned by use of high pressure/low volume steam or water spray; by hand or remote wiping, washing, brushing, or scrubbing using a cleaning agent; and/or, by other appropriate methods. Decontamination would be conducted to minimize the quantity of rinsates generated and would be documented on a checklist similar to Figure 7-1. After cleaning, tank interiors will be examined visually for a clean debris surface. Because of possible radiation exposure, visual inspection could be performed remotely using a camera or other device. Visual acceptance will be documented on the checklist used to document the decontamination. Copies of completed decontamination and verification checklist(s) would be managed as described in Section 7.1.2.

Material that does not meet the visual clean debris surface standard could be removed. If not removed, the material will be directly sampled or decontamination rinsate will be collected and sampled to verify achievement of an analytical clean closure standard (Chapter 6.0, Section 6.2.1.2).

7.2.1.2 Closure of Tank External Surfaces

External surfaces of tanks D-4, D-5, D-7, D-7, D-8, and the overflow tank are documented to have contacted hazardous waste (Chapter 3.0, Section 3.3.2), and so will be decontaminated using any of the methods used to decontaminate tank internal surfaces. Decontamination rinsate will be collected, designated, and transferred to the DST System. Decontamination will be documented on a checklist similar to Figure 7-1. Decontaminated areas will be inspected and visual acceptance would be documented on the checklist used to document the decontamination. As an alternative to visual inspections, the material will be directly sampled to verify achievement of the appropriate analytical standard (Chapter 6.0, Section 6.2.1.2).

Before using decontamination solutions on the outside of the tanks, the floor will be inspected for cracks or other openings that could provide a pathway to soil for decontamination solutions. The cracks will be sealed before beginning treatment or other engineered containment devices (e.g., portable catch basins, liners) will be used to collect and contain solutions.

The outside of previously uncoated, stainless steel tank D-8 was spray painted in 1992. At that time, spraying of lead-based paint was prohibited and paint containing hazardous constituents (e.g., lead) at regulated levels generally was no longer used onsite. Before painting, the tank surface would have been cleaned to remove oil, foreign matter, and waste residues (e.g., crystals from the salts or caustic) so the paint could adhere to the tank surface. While no documentation of this cleaning is available, the adhesion of the paint provides evidence of the activity. Even nominal cleaning would have reduced waste residues beneath the new paint to well below waste designation levels. Because the contaminants beneath the painted tank reasonably do not exist above dangerous waste designation levels, the paint will not require removal for tank clean closure.

7.2.2 Piping and Ancillary Equipment Closure Activities

Waste transfer piping and ancillary equipment (e.g., waste transfer pumps, agitators), including the sample glovebox, could be removed, designated, and disposed as described in Section 7.1.3. Alternatively, interior and exterior surfaces of these materials could be decontaminated in-place to meet a visual or analytical clean closure standard (Chapter 6.0, Section 6.2.1.1 and 6.2.1.2, respectively) using methods described in Section 7.2.1 for closure of tanks.

The interior surfaces of piping and contaminated ancillary equipment that will not be removed at closure will be flushed. The flush solution could be sampled or, where accessible for visual inspection, interior surfaces could be inspected visually for a clean debris surface. Exterior surfaces of piping and ancillary equipment will be inspected visually for a clean debris surface as-is. Visual acceptance of interior and exterior surfaces would be documented on a checklist similar to Figure 7-1. Exterior surfaces unable to meet the visual standard will be cleaned and re-inspected or will be directly sampled to verify achievement of an analytical standard. Clean closed piping will be blanked to ensure that the pipe remains clean and the tank remains isolated.

Surfaces of system piping and components shown to have not contacted dangerous waste can be closed without decontamination. Examples of this would be unused pipe (e.g., spare D-8 pipe) or the annulus of a double wall pipe with no history of leaks (e.g., new double-walled D-8 pipe) or, piping exterior surfaces where the absence of spills or leaks can be visually verified and documented on a checklist similar to Figure 7-1.

Materials that will not be removed at closure and do not meet clean closure standards will be dispositioned for closure in conjunction with the future CERCLA response action that includes these materials.

7.2.3 Activities for Closure of the Concrete

Concrete vault cells containing tanks D-4, D-5, D-7, and D-8 will not be removed under this plan. Concrete surfaces will be clean closed in-place by achievement of visual or analytical clean closure levels. Surfaces not able to meet clean closure standards will remain in place for disposition and final closure in conjunction with the future CERCLA Removal Action that includes these structures. Vault cell D-6 is outside the scope of 241-Z closure (Chapter 6.0, Section 6.1).

Vault cell floors, walls, and ceiling surfaces will first be inspected visually to identify areas that meet the clean debris surface standard as-is (i.e., without decontamination). Visual acceptance of the remaining floors and walls will be documented on a checklist similar to Figure 7-1.

Each tank is installed on a concrete support pad. The space between the tank bottom and the support pad is grouted to equally support the tank weight. Void spaces are not anticipated to exist that could harbor contamination sufficient to designate this material as dangerous waste. Consequently, these areas can be clean closed after inspection verifying the absence of void spaces. The absence of void spaces will be documented on a checklist similar to Figure 7-1.

Potentially contaminated areas identified by initial visual inspections will be decontaminated to a clean debris surface. Cleaning could be by hand using mops, rags, brushes, water, and appropriate nonregulated detergent or by mechanical means using a power scrubber, high-pressure/low-volume steam or water spray, or by scabbling sufficient to remove the indication. Cleaning would be conducted so as to minimize the quantity of rinsates generated. Before use of decontamination solutions, floors and walls will be inspected for cracks or other openings that could provide a pathway to soil for decontamination solutions and addressed (Section 7.2.1.2). Rinsate and decontamination waste will be collected, designated, and managed accordingly. Sumps used as rinsate collection areas will be cleaned last and inspected after cleaning. Decontamination will be documented on a checklist similar to Figure 7-1. Decontaminated surfaces will be re-inspected and visual acceptance documented on the checklist.

Clean closure of decontaminated concrete surfaces could be verified analytically instead of by visual inspections. Concrete surfaces will be wiped or chip sampled (Chapter 6.0, Section 6.2.1.2) or decontamination rinsate will be collected and sampled in accordance with the approved SAP. Acceptance of the analytical standard would be documented on a checklist.

7.2.4 Activities for Closure of the Soils Directly Beneath the Unit

The concrete vault cells constitute a containment system to collect and channel leaks or spills to sumps from which the solutions have been pumped back into the tank system. The soils only could be contaminated if the concrete had failed. Concrete surfaces will be inspected to identify cracks that could provide a pathway for dangerous waste or dangerous waste residues. If no cracks are noted, the soil will be designated as achieving clean closure. If significant cracks are identified, cracks will be mapped and investigated to determine if the cracks penetrated the thickness of the concrete. If through-thickness cracks exist, operating records will be reviewed to determine if spills occurred to the location of the crack and a potential for soil contamination exists. Potential soil contamination will be documented for investigation, disposition, and final closure in coordination with the appropriate CERCLA action (Chapter 6.0, Section 6.1).

The top surfaces of the concrete tank support pads and the floor beneath the support pads are not accessible for visual inspection. The edges of the tank support pads will be inspected for cracks. If no significant cracks are found at the pad edges, significant cracks in the non-visible portions are unlikely. In the unlikely event that significant cracks in the pad exist that did not propagate to pad edges, it remains unlikely that waste could have reached them since the tanks have not been shown to be leaking and because no space exists to contain waste (Section 7.2.3). However, if significant cracks are found in the support pad edges surrounding concrete and if cracks or leaks are found in tank bottoms during visual inspection, the soil will be considered potentially contaminated and will be documented for investigation, disposition, and final closure in coordination with the CERCLA action (Chapter 6.0, Section 6.1) for this soil.

7.2.5 Other Activities Required for Closure

Temporary containment ('greenhouse' type structure) for control of radioactive airborne contamination from decontamination activities could be constructed in accordance with the appropriate job safety documents to provide negative air pressure, HEPA filtration, and other attributes, as necessary, to protect personnel and the environment. These activities are outside the scope of this closure plan.

Equipment used during closure activities will be decontaminated as necessary for reuse or disposed as waste.

If 241-Z can not clean close under this plan, the unit will remain ‘unclosed’ until disposition of remaining contamination and final TSD unit closure in conjunction with the appropriate future CERLCA response action(s). The schedule for CERCLA actions that would complete TSD unit closure is provided in TPA milestone M-83-32. This schedule represents an approved ‘extension of the closure period’ in accordance with WAC 173-303-610(4) (b) to allow coordination of RCRA closure with CERLCA response actions and is the schedule for 241-Z closure to achieve compliance with RCRA closure requirements. The 241-Z Part A, Form 3, will remain open but be modified to identify the portions of the unit that met clean closure standards and those that have not. During this extended closure period, steps will be taken as required by WAC 173-303-610 (4)(b) to prevent threats to human health and the environment from the unclosed portions of the unit by ensuring that conditions do not develop that could mobilize remaining contamination. If ongoing inspections of unclosed areas are determined to be necessary, such inspections may occur in conjunction with PFP surveillance and maintenance activities. Inspection information would be provided to Ecology that would include the inspection schedule, inspection parameters, and response to unsatisfactory conditions. Inspections of the unclosed unit during this extended closure period do not equate to postclosure care. Because during an extended closure period the unit would no longer be operating or managing waste, a personnel training plan and contingency plan would not be required for the unclosed portions. A personnel training plan would not be necessary because the unit would not be operating and trained operators are not required. A contingency plan would not be necessary because the unit would not be managing waste and contingency planning for possible accidents is not necessary.

7.3 SCHEDULE OF CLOSURE

A schedule for the 241-Z closure activities under this plan is provided in Figure 7-2. Because of the size and complexity of this unit, closure activities will require greater than 180 days to complete. However, TPA milestones M-83-31 and M-83-32 (Chapter 1.0) have been developed recognizing that 241-Z closure will be coordinated with PFP deactivation activities and could be coordinated with future CERCLA action(s), as necessary. TPA milestone M-83-31 indicates that after June 30, 2005, the 241-Z tank system is to cease waste liquid discharges to Tank Farms. 241-Z closure activities might not begin until after this date. TPA milestone M-83-32 does not require 241-Z closure plan activities to be completed until September 2011. If closure activities begin in June 2005, as allowed, and end in September 2011, as required, the approved closure period under these milestones is approximately 6 years. Consequently, even though closure activities identified in Figure 7-2, once begun, could require greater than 180 days to complete, a WAC 173-303-610 (4)(b) extension of the closure period will not be required as long as closure activities under this plan are completed by September 30, 2011. If final closure activities can not be completed by September 2011, an extension of closure in accordance with the requirements of WAC 173-303- 610(4) (b) would be requested.

7.4 AMENDMENT OF PLAN

Any amendments to the closure plan will be submitted in accordance with WAC 173-303-610(3) (b) and the *Hanford Facility Dangerous Waste Permit Application, General Information Portion* (DOE/RL-91-28).

7.5 CERTIFICATION OF CLOSURE

Certification of closure will be submitted in accordance with WAC 173-303-610(6) and the *Hanford Facility Dangerous Waste Permit Application, General Information Portion* (DOE/RL-91-28).

Figure 7.1. Example 241-Z Decontamination and Verification Checklist

241-Z TREATMENT AND STORAGE TANKS
CLOSURE DECONTAMINATION AND VERIFICATION CHECKLIST

This checklist is intended to document decontamination of the following 241-Z components, structures, and/or materials and verification of visual or analytical clean closure standards for the materials.

1. Building/location: ____________________
2. Component(s)/area(s) (e.g., D-4 tank interior) ____________________
3. Material (e.g., concrete, metal): ____________________
4. No cracks or openings are visible that could have provided a pathway to soil for contamination. ____________________
5. No contact with dangerous waste. ____________________
6. No void space under tank. ____________________

____________________ ____________________
Signature Date

7. Decontamination:

A. Method (NA step 5.C if no decontamination performed) ____________________

B. Parameters (check appropriate parameters):
- ☐ Temperature ____________________
- ☐ Propellant ____________________
- ☐ Pressure ____________________
- ☐ Surfactant(s) ____________________
- ☐ Detergents/solvents ____________________
- ☐ Grinding/striking media (e.g., wheels) ____________________

C. Decontamination (steps 6A and B) is complete.

____________________ ____________________
Signature Date

8. The identified materials were:
- ☐ Visually inspected and have attained a clean debris surface[1]
- ☐ Sampled and meet an analytical clean closure standard[2]. Reference results (e.g., sample number)

____

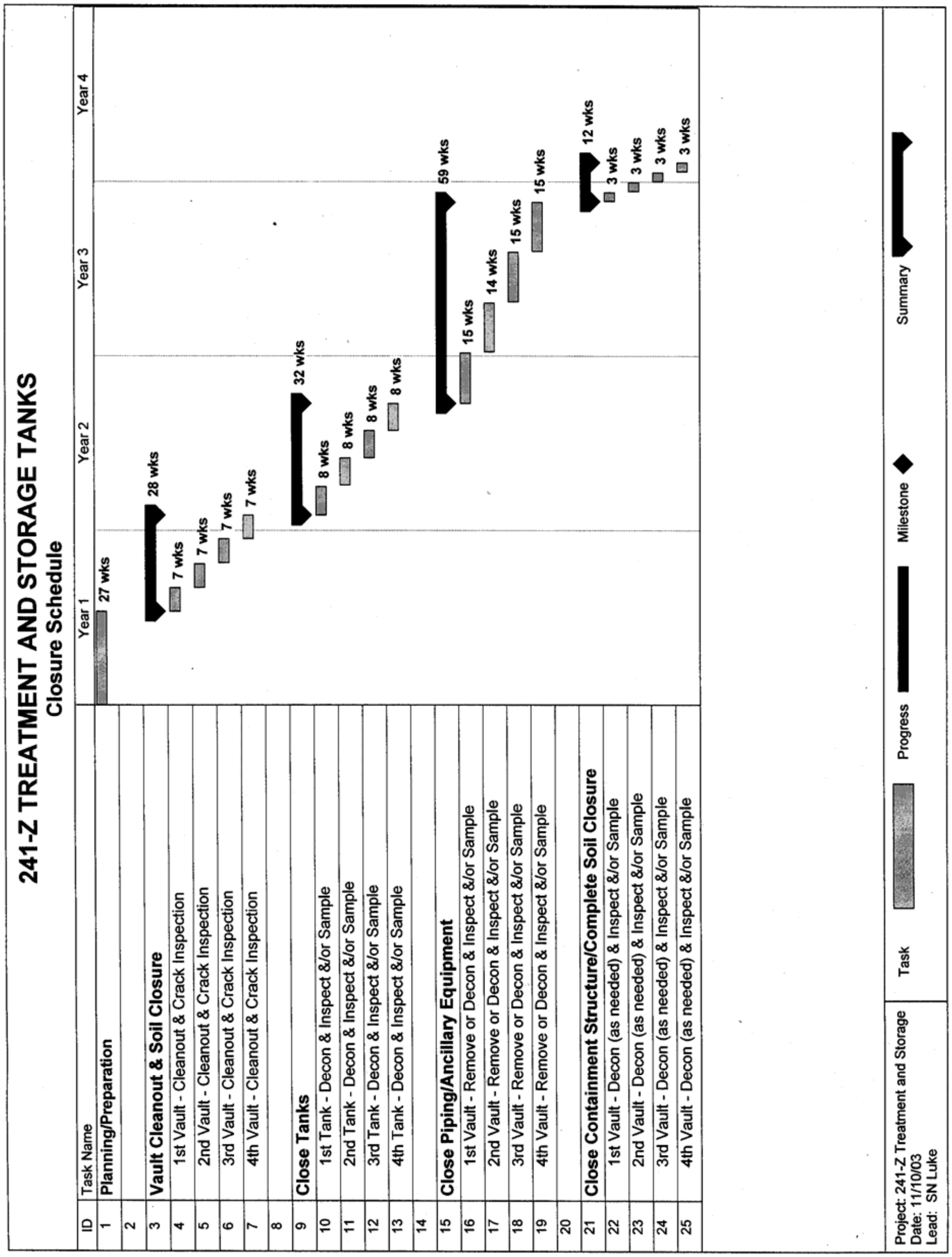
Authorized Representative:

____________________ ____________________
Signature Date

1 Definition of 'clean debris surface' from Table 1, Alternative Treatment Standards for Hazardous Debris (40 CFR 268.45): "'Clean debris surface' means the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discoloration's, and soil and waste in cracks, crevices, and pits, may be present provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no more than 5% of each square inch of surface area".

2 See Chapter 6.0, Section 2.1.2 for analytical clean closure standards.

Figure 7.2. Closure Activities Schedule for the 241-Z.



Chapter 8.0 Post Closure

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8.0 POST CLOSURE

The 241-Z is proposed to be clean closed in which case no postclosure care would be required.

If the unit cannot be clean closed under this plan, 241-Z would enter an extended closure period with final closure to occur at a later date in conjunction with the appropriate future 241-Z CERCLA response action(s) (Chapter 6.0, Section 6.1). During an extended closure period, steps that do not equate to postclosure care would be taken as described in Chapter 7.0, Section 7.2.5 to prevent threats from the unclosed but not operating unit.

If the future CERCLA response action(s) does not allow for final 241-Z clean closure, the TSD unit would be closed using an alternative closure method under the closure provisions of WAC 173-303-610 and the HF RCRA Permit, Section II.K. Such alternative closure methods (e.g., 'modified' closure or landfill closure) would generally require postclosure care in which case a plan for postclosure care would be generated to address WAC 173-303-610(1)(b) required inspections, maintenance, monitoring, institutional controls, and periodic assessments during the postclosure period. These requirements could be coordinated with the surveillance and maintenance plan for the PFP Complex.

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Chapter 9.0 References

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9.0 REFERENCES

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DOE/RL-90-39, *Double-Shell Tank System Dangerous Waste Permit Application*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

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