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Waste Tank Summary Report for Month Ending December 31, 1998

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Prepared for the U.S. Department of Energy
Office of Environmental Restoration and Waste Management

FLUOR DANIEL HANFORD, INC.
Richland, Washington

Hanford Management and Integration Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

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Waste Tank Summary Report for Month Ending December 31, 1998

B. M. Hanlon
Lockheed Martin Hanford Corp.

Date Published
February 1999

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WASTE TANK SUMMARY REPORT

B. M. Hanlon

ABSTRACT

This report is the official inventory for radioactive waste stored in underground tanks in the 200 Areas at the Hanford Site. Data that depict the status of stored radioactive waste and tank vessel integrity are contained within the report. This report provides data on each of the existing 177 large underground waste storage tanks and 63 smaller miscellaneous underground storage tanks and special surveillance facilities, and supplemental information regarding tank surveillance anomalies and ongoing investigations. This report is intended to meet the requirement of U. S. Department of Energy-Richland Operations Office Order 5820.2A, Chapter I, Section 3.e. (3) (DOE_RL, 1990, Radioactive Waste Management, U. S. Department of Energy-Richland Operations Office, Richland, Washington) requiring the reporting of waste inventories and space utilization for Hanford Tank Farm tanks.

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METRIC CONVERSION CHART		
1 inch	=	2.54 centimeters
1 foot	=	30.48 centimeters
1 gallon	=	3.80 liters
1 ton	=	0.90 metric tons
$°F = \left(\frac{9}{5}°C\right) + 32$		
1 Btu/h = 2.930711 E-01 watts (International Table)		

WASTE TANK SUMMARY REPORT
FOR MONTH ENDING DECEMBER 31, 1998

Note: Changes from the previous month are in bold print.

I. WASTE TANK STATUS

Category	Quantity	Date of Last Change
Double-Shell Tanks[c]	28 double-shell	10/86
Single-Shell Tanks[a]	149 single-shell	07/88
Assumed Leaker Tanks	67 single-shell	7/93
Sound Tanks	28 double-shell 82 single-shell	1986 7/93
Interim Stabilized Tanks[b,d]	119 single-shell	11/97
Not Interim Stabilized [f]	30 single-shell	11/97
Intrusion Prevention Completed[e]	108 single-shell	09/96
Controlled, Clean, and Stable[I]	36 single-shell	09/96
Watch List Tanks [g] Total	**22 single-shell** 6 double-shell **28 tanks**	**12/98[h]** 6/93

[a] All 149 single-shell tanks were removed from service (i.e., no longer authorized to receive waste) as of November 21, 1980.

[b] Of the 119 tanks classified as Interim Stabilized, 64 are listed as Assumed Leakers. The total of 119 Interim Stabilized tanks includes one tank that does not meet current established supernatant and interstitial liquid stabilization criteria. (See Table I-1 footnotes, item #2)

[c] Six double-shell tanks are currently included on the Hydrogen Watch List and are thus prohibited from receiving waste in accordance with "Safety Measures for Waste Tanks at Hanford Nuclear Reservation," Section 3137 of the *National Defense Authorization Act for Fiscal Year 1991*, November 5, 1990, Public Law 101-510.

[d] **Of the 22 single-shell tanks on Watch Lists, only one (SX-109) has been Interim Stabilized.**

[e] **Of the 22 single-shell tanks on Watch Lists, only one (SX-109) has completed Intrusion Prevention (this category replaced Interim Isolation).** (See Appendix C for "Intrusion Prevention" definition).

[f] Three of these tanks are Assumed Leakers (BY-105, BY-106, SX-104). (See Table H-1)

[g] See Section A tables for more information on Watch List Tanks.

[h] Dates for the Watch List tanks are "officially added to or removed from the Watch List" dates. **Eighteen tanks were removed from the Organics Watch List in December 1998; two tanks still remain on this watch list.** See Table A-1, Watch List Tanks, for further information.)

[I] The TY tank farm was officially declared Controlled, Clean, and Stable in March 1996. The TX tank farm and BX tank farms were declared CCS in September 1996. (BX-103 has been declared to have met current interim stabilization criteria, and is included in CCS - see also Appendix I).

II. WASTE TANK INVESTIGATIONS

This section includes all single-shell tanks or catch tanks which are showing surface level or interstitial liquid level (ILL) decreases, or drywell radiation level increases in excess of established criteria.

There are currently no tanks under investigation for ILL decreases or drywell radiation level increases which exceed the criteria. Drywell monitoring is done on an "as needed basis" with the exception of tanks C-105 and C-106 which are monitored monthly.

A. Assumed Leakers or Assumed Re-leakers: (See Appendix C for definition of "Re-leaker")

This section includes all single- or double-shell tanks or catch tanks for which an off-normal or unusual occurrence report has been issued, or for which a waste tank investigation is in progress, for assumed leaks or re-leaks. Tanks/catch tanks will remain on this list until either a) completion of Interim Stabilization, b) the updated occurrence report indicates that the tank/catch tank is not an assumed leaker, or c) the investigation is completed.

There are currently no tanks for which an off-normal or unusual occurrence report has been issued for assumed leaks or re-leaks.

B. Tanks with increases indicating possible intrusions:

This section includes all single-shell tanks and related receiver tanks for which the surveillance data show that the surface level or ILL has met or exceeded the increase criteria, or are still being investigated.

Candidate Intrusion List: Increase criteria in the following tanks indicate possible intrusions; however, no funds were allocated for performing intrusion investigations in FY 1999 due to higher priority work in the area of safe storage.

Tank 241-B-202
Tank 241-BX-101
Tank 241-BX-103
Tank 241-BY-103
Tank 241-C-101
Tank 241-U-111

244-AR Tanks and Sumps: Currently, all ventilation systems at 244-AR are shut down. Based on the weight factor gauges for the sumps and tanks, Tank 001 contains 1,300 gallons, Tank 002 contains 12,250 gallons, Tank 003 contains 2,000 gallons, and Tank 004 contains 250 gallons. Sump 001 contains 15.5 gallons, Sump 002 contains 0-2 gallons, and Sump 003 contains 3,300 gallons. **There was no change in tank/sump contents as of December 31, 1998.** Status of jet pumping: first attempts at jetting were unsuccessful. **There is no funding foreseeable for jet pumping in FY99.**

Catch Tank 241-AX-152: The liquid level in this catch tank was steady around 66.75 inches from the startup of Project W-030, Tank Farm Ventilation System," in March 1998 until late August 1998. The level then began to decrease. The October reading of 65 inches is 1.75 inches below the summer average. This is an active catch tank, routinely pumped, and deviations from baseline are not applicable per OSD-31. The decrease represents a significant change in trend and it is apparent that tank conditions changed around the end of August 1998.

Resolution Status: Discrepancy Report #98-853 was issued on November 4, 1998. One possible cause under investigation is a change in flow path, causing an increase in evaporation. The tank was pumped down to 2.25 inches on November 13, 1998. **Since that time the level has decreased to 0.00 inches.** The Discrepancy Report will remain open and the tank will remain on the alert list until an engineering investigation is complete.

III. SURVEILLANCE AND WASTE TANK STATUS HIGHLIGHTS

1. Single-Shell Tanks Saltwell Jet Pumping (See Table E-6 footnotes for further information)

Tank 241-C-106 – Waste removal operations were initiated on November 18, 1998. Commencement of sluicing (sludge removal) began the process of waste removal in the highest heat-generating single-shell storage tank. Wastes from C-106 will be pumped underground through a new specially constructed pipeline to AY-102. The ventilation system for AY-102 is designed for the anticipated heat load of the waste from C-106.

Through mid-December 1998, sluicing of tank C-106 was on hold for evaluation of stack gaseous emissions that occurred during the first sluicing batch on November 18, 1998. A Process Test Plan was developed and conducted on December 16, 1998, to obtain better gas sample data under controlled sluicing conditions. The Process Test was aborted early due to a jumper leak in the tank C-106 sluice pit. Approximately 0.8 inches (2,300 gallons) of sludge was transferred to tank AY-102 during this Process Test. Following the Process Test, temperature readings on the thermocouple tree in Riser 14 increased to approximately 220-225 degrees; this has been attributed to the improved contact between the sludge and the thermocouple tree as a result of sluicing.

Tank 241-SX-104 - Pumping resumed October 7, 1998, and was shut down for several periods during each succeeding month for other priority work, transfer of waste, and cold weather problems. 3.7Kgallons were pumped in December; 7,330 gallons of dilution water and 966 gallons of water for transfer line flushes were used during December pumping operations. A total of 162.2 Kgallons has been pumped from this tank.

Tank 241-SX-106 – Pumping started on October 7, 1998, and was shut down for several periods during each succeeding month for other priority work, transfer of waste, and cold weather problems. 3.2 Kgallons were pumped in December; 2,846 gallons of dilution water and 1,120 gallons of water for transfer line flushes were used during December pumping operations. A total of 14.9 Kgallons has been pumped from this tank.

Tank 241-T-104 - Pumping resumed on June 7, 1998; 2.1 Kgallons were pumped in December. Actual volume of liquid remaining to be pumped is still a rough estimate. Volumes will be adjusted as porosity data becomes available with continued pumping; 1,066 gallons of raw water were used during December for pumping operations. A total of 144.8 Kgallons has been pumped from this tank.

Tank 241-T-110 - Pumping resumed in July after the pump was replaced; 1.9 Kgallons were pumped in December. Actual volume of liquid remaining to be pumped is still a rough estimate. Volumes will be adjusted as porosity data becomes available with continued pumping; 786 gallons of raw water were used during December for pumping operations. A total of 39.0 Kgallons has been pumped from this tank.

Saltwell Screens – Saltwell screens have been installed in Tanks S-102, S-106, S-109, and S-111. Screens are expected to be installed in Tank U-103 in January 1999, and in Tank U-102 in February 1999.

2. Single-Shell Tank TPA Interim Stabilization Milestones

All M-41-xx Milestones are being renegotiated. See also Table I-2, Tri-Party Agreement Single-Shell Tank Interim Stabilization Schedule.

3. Tank Waste Remediation System Safety Initiatives

The U. S. Secretary of Energy has directed that six safety initiatives be implemented in the Tank Waste Remediation System Program to accelerate the mitigation/resolution of the high priority waste tank safety issues at the Hanford Site. Forty-two milestones were established for accomplishing the initiatives.

> **Safety Initiative SI 6d - Initiate C-106 Accelerated Retrieval, was completed on November 18, 1998; however, the letter to DOE-HQ has not been transmitted yet.**

The following Safety Initiatives remain to be completed:

SI 4a - Upgrade Alarm Panels in Seven Tank Farms
SI 4c - Complete Accelerated Walk-Downs and Field Verify Essential Drawings
Completion dates for Safety Initiatives 4c and 6d have been missed.
SI 4a - An assessment of the Completion Record is being evaluated for this Safety Initiative.

4. Double-Shell Tank 241-SY-101 Waste Level Increase

Although the waste level in tank SY-101 has risen slowing and steadily since last February, the surface level and hydrogen venting are within safety and operating limits. A mixer pump was installed in the tank in July 1993, which circulates liquid wastes from the tank's upper layer down to the bottom where jet nozzles discharge the fluid about two feet from the bottom. This prevents gas bubbles from building up at the bottom, and results in venting of small steady gas releases, rather than in large infrequent gas releases. Investigations continue on why the surface level is rising.

Several void fraction instrument (VFI) readings have been completed which gives the void fraction at depth in the riser through which it is deployed. The VFI readings indicate that the level increase is due to gas trapped in the crust, which comprises the upper approximately 60 inches of waste. **The results of the core sampling (of both retained gas sampling and regular cores) and the VFI results, are in agreement.**

Resolution Status: On February 11, 1998, the PRC recommended that the DOE-RL declare an Unreviewed Safety Question (USQ) over the continued level growth observed in this tank. The PRC implemented a standing order (SO) that placed operational restrictions on mixer pump operations. The SO released Operations from required actions at waste levels of 402 inches as measured by the Riser IC ENRAF. Riser 1A was rebaselined from 403.65 to 417.5 inches in August, USQ approval #TF-98-0852. Riser 1C has readings of 405.24 inches. DOE has modified the 406-inch and 422-inch mixer pump operational controls to allow additional mixer pump and characterization operations. Tank Farms has implemented TWO Standing Order 99-01 to reflect the relaxation of mixer pump operating controls at 406 and 422 inches. The contractor has established a multi-disciplinary team to solve the level growth issues in SY-101.

5. Closure of Unreviewed Safety Question (USQ) for Organic Watch List Tanks

In October 1998, DOE-RL closed the USQ for Condensed-Phase Organic Nitrate for single-shell tanks, double-shell tanks, and double-contained receiver tanks. This USQ is still open as it applies to inactive miscellaneous underground storage tanks (MUSTs). Closure of this USQ does not resolve the Organic Safety Issue or grant authorization to amend the current Basis for Interim Operation or Authorization Basis.

In December 1998, DOE-RL approved the request to remove the following 18 organic complexant tanks from the organic complexant Watch List: 241-A-101, AX-102, B-103, S-102, S-111, SX-103, SX-106, T-111, TX-105, TX-118, TY-104, U-103, U-105, U-106, U-107, U-111, U-203, U-204. Eight of these tanks are also on the Hydrogen (Flammable Gas) Watch List.

Two tanks (C-102 and C-103), which contain organic solvents, will also remain on the Organic Watch List until DOE receives and analyzes the technical data on resolution of the organic solvent safety issue expected in early 1999.

Twenty-eight tanks are currently on Watch Lists: 25 tanks on the Hydrogen Watch List (19 SSTs and 6 DSTs), 2 tanks on the Organic solvent Watch List, and 1 tank (C-106) on the High Heat Watch List.

6. Characterization Progress Status (See Appendix J)

Characterization is the understanding of the Hanford tank waste chemical, physical, and radiological properties to the extent necessary to ensure safe storage and interim operation, and ultimate disposition of the waste.

Characterization Progress for December:

In December 1998, requirements for closed safety issues such as organic complexants and hazardous vapors were removed. This action has resulted in upgrading the status for 15 tanks (B-101, B-106, B-112, B-201, B-203, B-204, BX-101, BX-109, C-203, SX-113, T-108, TX-107, TY-106, U-201, and U-202) to "complete." No further sampling is required for these tanks.

However, 12 new tanks (AN-102, AN-103, AN-104, AN-105, AN-107, AP-108, AW-101, AY-102, AZ-101, AZ-102, C-104, and C-106) have been added to the requirements matrix as a result of high- and low-level waste requirements for retrieval. This addition has resulted in the downgrading of two tanks (AN-103 and C-104) from being "complete" to being in the sampling and analysis process.

Core sampling in December was done for tank SY-101; the analysis has not been completed. Grab samples were taken from AY-102.

7. New Pumping Estimates for Remaining Single-Shell Tanks Which Are Not Yet Stabilized

Document HNF-2978, "Updated Jet Pump Durations for Interim Stabilization of Remaining Single-Shell Tanks," Rev. 0, dated July 15, 1998, provides the technical bases for the new volume estimates for the remaining twenty-nine single-shell tanks (excluding Tank C-106), which will be interim stabilized. Included are the estimates of the volume by waste phase (supernate, saltcake, sludge) and volumes important to pumping operations (drainable liquid remaining, drainable interstitial liquid, pumpable liquid remaining).

These new volumes have been incorporated in Appendix E of this report. Note that the volumes reported in document HNF-2978 are as of July 1998, and do not reflect pumping which occurred in Tanks SX-104, SX-106, T-104 and T-110 since that date.

8. PMHC-TANKFARM-1998-0156, Off-Normal Occurrence Report, "Potential Inadequacy of Authorization Basis (USQ)," Initial Update December 31, 1998.

On December 31, 1998, the Plant Review Committee (PRC) concluded that a Potential Inadequacy in the Authorization Basis (PIAB) exists.

The Unreviewed Safety Question (USQ) screening results indicate drainage volume from some transfer routes could potentially exceed the assumptions used in the Basis for Interim Operation (BIO) on the volume of liquid that could drain from a pipe in the event of a leak.

Immediate Actions: (1) Stop all waste transfers, (2) Standing Order TWO-99-005 was issued, which describes actions and approvals necessary prior to performing each transfer.

The USQ states: Based on HNF-3612, "Hydraulic Calculations for Cross Site Transfer System and Selected Physically Connected Routes," a larger transfer line drainback of volume than previously analyzed in the Authorization Basis appears to be possible.

During preparation for an upcoming cross-site transfer, piping runs associated with the Cross Site Transfer System were identified that result in larger transfer line drainback volumes than analyzed in the Authorization. The USQ screening determines if the increase in drainback volume represents an analytical error, omission, or deficiency in the authorization basis.

Conclusion: The USQ screening determined that the piping runs available drainback represent a deficiency in the Authorization basis. As other transfer routes (e.g., 244-BX to 241-AP-106) may have piping runs yielding larger drainback volumes than previously analyzed, this PIAB is extended to cover <u>any</u> transfer route. Based on the increased length of pipe leading to larger volume of drainback (i.e., increase the material at risk), a potential deficiency in the Authorization Basis exists that could lead to increased consequences over that previously analyzed for any transfer route.

9. TEMP-NR-001, Off-Normal Report, "241-C-106 Riser #14 Thermocouple Temperature Exceeded 218 Degrees," Notification Report, dated December 29, 1998.

The temperature reported by Riser 14, thermocouple #1 in tank 241-C-106 exceeded the 218-degree limit at 1920 hours through 1994 hours on December 27, 1998. The temperature dropped below 218 degrees at 1944 hours, and can be expected to exceed the 218-degree limit until the sluicing process resumes.

The Administrative Control directs the implementation of a recovery plan if the temperature limit is exceeded. The Recovery Plan directs operations to initiate the following recovery actions:

> **Stop all waste transfers, verify cover blocks are on the pump pits, start up the 296-P-16 exhauster and inlet air chiller system to enhance waste cooling.**

All recovery actions were initiated with the exception of the inlet air chiller system which will not be started until the ambient air temperature increases. This action will be initiated when the ambient temperature is acceptable to prevent damage to the chiller compressors and heat addition from the glycol pumps.

APPENDIX A

WASTE TANK SURVEILLANCE MONITORING TABLES

TABLE A-1. WATCH LIST TANKS

December 31, 1998

These tanks have been identified as Watch List Tanks in accordance with Public Law 101-510, Section 3137, "Safety Measures for Waste Tanks at Hanford Nuclear Reservation," (1990). These tanks have been identified because they "... may have a serious potential for release of high-level waste due to uncontrolled increases in temperature or pressure."

Single-Shell Tanks Tank No.	Watch List	Officially Added to Watch List
A-101	Hydrogen	1/91
AX-101	Hydrogen	1/91
AX-103	Hydrogen	1/91
C-102	Organics	5/94
C-103	Organics	1/91
C-106	High Heat	1/91
S-102	Hydrogen	1/91
S-111	Hydrogen	1/91
S-112	Hydrogen	1/91
SX-101	Hydrogen	1/91
SX-102	Hydrogen	1/91
SX-103	Hydrogen	1/91
SX-104	Hydrogen	1/91
SX-105	Hydrogen	1/91
SX-106	Hydrogen	1/91
SX-109	Hydrogen because other tanks vent thru it	1/91
T-110	Hydrogen	1/91
U-103	Hydrogen	1/91
U-105	Hydrogen	1/91
U-107	Hydrogen	12/93
U-108	Hydrogen	1/91
U-109	Hydrogen	1/91
22 Tanks		

Double-Shell Tanks Tank No.	Watch List	Officially Added to Watch List
AN-103	Hydrogen	1/91
AN-104	Hydrogen	1/91
AN-105	Hydrogen	1/91
AW-101	Hydrogen	6/93
SY-101	Hydrogen	1/91
SY-103	Hydrogen	1/91
6 Tanks		

TANKS BY WATCH LIST

Hydrogen	Organics
A-101	C-102
AX-101	C-103
AX-103	2 Tanks
S-102	
S-111	
S-112	
SX-101	
SX-102	
SX-103	**High Heat**
SX-104	C-106
SX-105	1 Tank
SX-106	
SX-109	
T-110	
U-103	
U-105	
U-107	
U-108	
U-109	
AN-103	
AN-104	
AN-105	
AW-101	
SY-101	
SY-103	
25 Tanks	3 Tanks

22 Single-Shell tanks
6 Double-Shell tanks
28 Tanks on Watch Lists

All tanks were removed from the Ferrocyanide and 18 tanks from Organics Watch Lists; see Table A-2.

TABLE A-2. ADDITIONS/DELETIONS TO WATCH LISTS BY YEAR
December 31, 1998

Added/Deleted dates may differ from dates that tanks were officially added to the Watch Lists. (See Table A-1).

	Ferrocyanide	Hydrogen	Organics	High Heat	Total Tanks (1) SST	DST	Total
1/91 Original List -Response to Public Law 101-5	23	23	8	1	47	5	52
Added 2/91 (revision to Original List)	1 T-107				1		1
Total - December 31, 1991	24	23	8	1	48	5	53
Added 8/92		1 AW-101				1	1
Total - December 31, 1992	24	24	8	1	48	6	54
Added 3/93			1 U-111		1		
Deleted 7/93	-4 (BX-110) (BX-111) (BY-101) (T-101)				-4		
Added 12/93		1 (U-107)			0		
Total - December 31, 1993	20	25	9	1	45	6	51
Added 2/94			1 T-111		1		
Added 5/94			10 A-101 AX-102 C-102 S-111 SX-103 TY-104 U-103 U-105 U-203 U-204		4		
Deleted 11/94	-2 (BX-102) (BX-106)				-2		
Total - December 1994 thru December 1995	18	25	20	1	48	6	54
Deleted 6/96	-4 (C-108) (C-109) (C-111) (C-112)				-4		
Deleted 9/96	-14 (BY-103) (BY-104) (BY-105) (BY-106) (BY-107) (BY-108) (BY-110) (BY-111) (BY-112) (T-107) (TX-118) (TY-101) (TY-103) (TY-104)				-12		
Deleted 12/98			18 (A-101) (AX-102) (B-103) (S-102) (S-111) (SX-103) (SX-106) (T-111) (TX-105) (TX-118) (TY-104) (U-103) (U-105) (U-106) (U-107) (U-111) (U-203) (U-204)		-10		
Total - December 1996 thru December 1998	0	25	2	1	22	6	28

(1) 18 tanks were removed from the Organics Watch List in December 1998: eight of these are also on the Hydrogen Watch List; two tanks (C-102 and C-103) are still on the Organics List. Total tanks added/deleted depends upon whether a tank is also on another list. See table A-1.

TABLE A-3. TEMPERATURE MONITORING IN WATCH LIST TANKS (Sheet 1 of 2)

December 31, 1998

All Watch List tanks are reviewed for increasing temperature trends. Temperatures in these tanks are monitored by the Tank Monitor And Control System (TMACS), unless indicated otherwise.

Temperatures are taken in the waste unless in-waste thermocouples are out of service. Temperatures below are the highest temperatures recorded in these tanks during this month, and do not exceed the maximum criteria limit for this month.

Temperatures in Degrees F.

Total Waste in Inches

(Total waste in inches is calculated from Inventory tables and size of tank, not surface level readings)

Hydrogen (Flammable Gas)			Organics		
Tank No.	Temp.	Total Waste	Tank No.	Temp	Total Waste
A-101	148	347	C-102	83	149
AX-101	130	272	C-103	117	66
AX-103	111	40	2 Tanks		
S-102	104	207			
S-111	90	224			
S-112	84	239			
SX-101	134	171			
SX-102	142	203	Tank No.	Temp	Total Waste
SX-103	161	243	C-106 (2)	220	72
SX-104	145	229	1 Tank		
SX-105	168	254			
SX-106	105	201	(Sluicing began November 18,		
SX-109 (1)	141	96	1998, in this tank)		
T-110	65	133			
U-103	86	166			
U-105	89	147			
U-107	79	143			
U-108	87	166			
U-109	84	164			
AN-103	109	348			
AN-104	109	384			
AN-105	106	410			
AW-101	101	410			
SY-101	122	405			
SY-103	95	270			
25 Tanks			3 Tanks		

All tanks have been removed from the Ferrocyanide Watch List. See Table A-2 for list and dates.
18 tanks have been removed from the Organics Watch List. See Table A-2 for list and dates.
22 Single-Shell Tanks and 6 Double-Shell Tanks remain on the Watch List

TABLE A-3. TEMPERATURE MONITORING IN WATCH LIST TANKS
(sheet 2 of 2)

Notes:

Unreviewed Safety Question(USQ):
When a USQ is declared, special controls are required, and work in the tanks is limited. There are currently no USQs on the tanks.

Hydrogen/Flammable Gas:
These are tanks which are suspected of having a significant potential for hydrogen/flammable gas generation, entrapment, and episodic release. **The USQ associated with these tanks was closed in September 1998. Twenty-five tanks (19 SST and 6 DST) remain on the Hydrogen Watch List**.

Organic Salts:
These are single-shell tanks containing concentrations of organic salts ≥3 weight% of total organic carbon (TOC)(equivalent to 10 wt% sodium acetate). **The USQ associated with these tanks was closed in October 1998, and 18 organic complexant tanks were removed from the Organic Watch List in December 1998. Two organic solvent tanks (C-102 and C-103) remain on the Organic Watch List.**

High Heat:
These are tanks which contain heat generating strontium-rich sludge and require drainable liquid to be maintained in the tank to promote cooling. Only tank C-106 is on the High Heat Watch List because in the event of a leak, without water additions the tank could exceed temperature limits resulting in unacceptable structural damage. The tank is cooled through evaporation in conjunction with active ventilation. Water is periodically added as evaporation takes place. **There is no USQ associated with tank C-106**.

Active ventilation:
There are 15 single-shell tanks on active ventilation (eight are on the Watch List as indicated by an asterisk):

C-105	SX-107
C-106 *	SX-108
SX-101 *	SX-109 *
SX-102 *	SX-110
SX-103 *	SX-111
SX-104 *	SX-112
SX-105 *	SX-114
SX-106 *	

Note: A-104, 105 and 106 exhauster has been out of service since 1991 and is no longer considered actively ventilated. Although C-104 has a cascade line with C-105, it is not considered to be actively ventilated.

Footnotes:

(1) Tank SX-109 has the potential for flammable gas accumulation only because other SX tanks vent through it.

(2) Tank C-106 is on the Watch List because in the event of a leak without water additions the tank could exceed temperature limits resulting in unacceptable structural damage.

TABLE A-4. TEMPERATURE MONITORING IN NON-WATCH LIST TANKS

December 31, 1998

SINGLE-SHELL TANKS WITH HIGH HEAT LOADS (>40,000 Btu/hr)

Ten tanks have high heat loads for which temperature surveillance requirements are established by OSD-T-151-00013. Only one of these tanks (241-C-106) is on the High Heat Watch List. In an analysis, WHC-SD-WM-ER-333, "Evaluation of Heat Sources in High Heat Single Shell Tanks," Bander, 1994, it was determined that six of the ten tanks have heat sources greater than 40,000 Btu/h. Additionally, although four tanks have heat loads less than 40,000 Btu/h, it is recommended that these tanks remain on the High Heat Load List because of uncertainties in the parameters used in these analyses. It is estimated that the current analysis predicts the heat loads within +/- 20%.

Temperatures in these tanks did not exceed OSD requirements for this month. All high heat load tanks, with the exception of 241-A-104 and 241-A-105, are on active ventilation. All high heat load tanks are monitored by the Tank Monitor and Control System (TMACS), with the exception of A-104 and A-105, which are taken manually on a weekly basis.

Tank No.	Temperature (F.)		Total Waste In Inches
A-104	175		10
A-105	139		07
C-106 (*)	220	(Riser 14)	72
	148	(Riser 8)	72
SX-107	165		43
SX-108	186		37
SX-109	141		96
SX-110	162		28
SX-111	186		51
SX-112	148		39
SX-114	179		71
10 Tanks			

(Total Waste In Inches is calculated from inventory table and tank size, not surface level readings)

(*) C-106 on High Heat Load Watch List. Sluicing began November 18, 1998.
Highest temperature in 34 lateral thermocouples beneath A-105: 237

SINGLE SHELL TANKS WITH LOW HEAT LOADS (<=40,000 Btu/hr)

There are 118 low heat load non-watch list tanks. Temperatures in tanks connected to TMACS are monitored by TMACS; temperatures in those tanks not yet connected to TMACS are manually taken semiannually in January and July. Temperatures obtained were within historical ranges for the applicable tank.

No temperatures have been obtained for several years in the tanks listed below. Most of these tanks have no thermocouple tree.

Tank No.	Tank No.
BX-104	TX-101
BY-102	TX-110
BY-109	TX-114
C-204	TX-116
SX-115	TX-117
T-102	U-104
T-105	

TABLE A-5. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS

149 TANKS (Sheet 1 of 6)

December 31, 1998

The following table indicates whether Single-Shell tank monitoring was in compliance with the requirements as specified in the applicable documents as of the last day of the applicable month:

NOTE:
All Watch List and High Heat tank temperature monitoring is in compliance. (4)
All Dome Elevation Survey monitoring is in compliance.
All Psychrometrics monitoring is in compliance (2).
Drywell monitoring is done "as needed" (9).
In-tank photos/videos are taken "as needed" (3)

LEGEND:	
(Shaded)	= in compliance with all applicable documentation
N/C	= noncompliance with applicable documentation
O/S	= Out of Service
Neutron	= LOW readings taken by Neutron probe
POP	= Plant Operating Procedure, TO-040-650
MT/FIC/ ENRAF	= Surface level measurement devices
OSD	= Operating Specifications Doc., OSD-T-151-00013, -00031
N/A	= Not applicable (not monitored, or no monitoring schedule)
None	= Applicable equipment not installed

Tank Number	Tank Category		Temperature Readings (4)	Primary Leak Detection Source (5)	Surface Level Readings (1) (OSR,OSD)			LOW Readings (OSD)(5,7)
	Watch List	High Heat			MT	FIC	ENRAF	Neutron
A-101	X			LOW	None	None		
A-102				None	None		None	None
A-103				LOW	None	None		
A-104		X		None	None	None		None
A-105		X		None		None	None	None
A-106				None	None	None		None
AX-101	X			LOW	None	None		(10)
AX-102				None	None	None		None
AX-103	X			None	None	None		None
AX-104				None	None	None		None
B-101				None	None		None	None
B-102				ENRAF	None	None		None
B-103				None	None		None	O/S
B-104				LOW		None	None	
B-105				LOW		None	None	
B-106				FIC	None		None	None
B-107				None		None	None	None
B-108				None	None		None	None
B-109				None		None	None	None
B-110				LOW	O/S	None	None	
B-111				LOW	None		None	
B-112				ENRAF	None	None		None
B-201				MT		None	None	None
B-202				MT		None	None	None
B-203				MT		None	None	None
B-204				MT		None	None	None
BX-101				ENRAF	None	None		None
BX-102				None	None	None		None
BX-103				ENRAF	None	None		None
BX-104			None	ENRAF	None	None		None
BX-105				None	None	None		None
BX-106				ENRAF	None	None		None
BX-107				ENRAF	None	None		None

TABLE A-5. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS

149 TANKS (Sheet 2 of 6)

Tank Number	Tank Category		Temperature Readings (4)	Primary Leak Detection Source (5)	Surface Level Readings (1) (OSD)			LOW Readings (OSD)(5,7)
	Watch List	High Heat			MT	FIC	ENRAF	Neutron
BX-108				None	None	None		None
BX-109				None	None	None		None
BX-110				None	None	None		None
BX-111				LOW	None	None		
BX-112				ENRAF	None	None		None
BY-101				LOW		None	None	
BY-102			None	LOW	O/S	None	None	
BY-103				LOW	None	None		
BY-104				LOW	O/S	None	None	
BY-105				LOW		None	None	
BY-106				LOW		None	None	
BY-107				LOW		None	None	
BY-108				None		None	None	None
BY-109			None	LOW	None	O/S	None	
BY-110				LOW	None	None		
BY-111				LOW	None	None		
BY-112				LOW		None	None	
C-101				None		None	None	None
C-102	X			None	None		None	None
C-103	X			ENRAF	None	None		None
C-104				None	None	O/S	None	None
C-105				None	None	None		None
C-106 (3)	X	X		ENRAF	None	None		None
C-107				ENRAF	None	None		None
C-108				None		None	None	None
C-109				None		None	None	None
C-110				MT		None	None	None
C-111				None		None	None	None
C-112				None	None	None		None
C-201				None		None	None	None
C-202				None		None	None	None
C-203				None		None	None	None
C-204			None	None		None	None	None
S-101				ENRAF	None	None		
S-102	X			ENRAF	None	None		
S-103				ENRAF	None	None		
S-104				LOW		None	None	
S-105				LOW	None	None		
S-106				ENRAF	None	None		
S-107				ENRAF	None	None		None
S-108				LOW	None	None		
S-109				LOW	None	None		
S-110				LOW	None	None		
S-111	X			ENRAF	None	None		
S-112	X			LOW	None	None		
SX-101	X			LOW	None	None	(11)	
SX-102	X			LOW	None	None		
SX-103	X			LOW	None	None		
SX-104	X			LOW	None	None		
SX-105	X			LOW	None	None		
SX-106	X			ENRAF	None	None		
SX-107		X		None		None	None	None
SX-108		X		None		None	None	None

TABLE A-5. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS

149 TANKS (Sheet 3 of 6)

Tank Number	Tank Category		Temperature Readings (4)	Primary Leak Detection Source (5)	Surface Level Readings (1) (OSD)			LOW Readings (OSD)(5,7)
	Watch List	High Heat			MT	FIC	ENRAF	Neutron
SX-109 (3)	X	X		None	None	None		None
SX-110		X		None		None	None	None
SX-111		X		None		None	None	None
SX-112		X		None		None	None	None
SX-113				None		None	None	None
SX-114		X		None		None	None	None
SX-115			None	None		None	None	None
T-101				None	None	None		None
T-102			None	ENRAF	None	None		None
T-103				None	None	None		None
T-104				LOW	None	None		
T-105			None	None	None	None		None
T-106				None	None	None		None
T-107				ENRAF	None	None		None
T-108				ENRAF	None	None		None
T-109				None	None	None		None
T-110	X			LOW	None	None		
T-111				LOW	None	None		
T-112				ENRAF	None	None		None
T-201				MT		None	None	None
T-202				MT		None	None	None
T-203				None		None	None	None
T-204				MT		None	None	None
TX-101			None	ENRAF	None	None		None
TX-102				LOW	None	None		
TX-103				None	None	None		None
TX-104				None	None	None		None
TX-105				None	None	None		None (7)
TX-106				LOW	None	None		
TX-107				None	None	None		None
TX-108				None	None	None		None
TX-109				LOW	None	None		
TX-110			None	LOW	None	None		
TX-111				LOW	None	None		
TX-112				LOW	None	None		
TX-113				LOW	None	None		
TX-114			None	LOW	None	None		
TX-115				LOW	None	None		
TX-116			None	None	None	None		None
TX-117			None	LOW	None	None		
TX-118				LOW	None	None		
TY-101				None	None	None		None
TY-102				ENRAF	None	None		None
TY-103				LOW	None	None		
TY-104				ENRAF	None	None		None
TY-105				None	None	None		None
TY-106				None	None	None		None
U-101				MT		None	None	None
U-102				LOW	None	None		
U-103	X			ENRAF	None	None		
U-104			None	None		None	None	None
U-105	X			ENRAF	None	None		
U-106				ENRAF	None	None		

TABLE A-5. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS

149 TANKS (Sheet 4 of 6)

Tank Number	Tank Category		Temperature Readings (4)	Primary Leak Detection Source (5)	Surface Level Readings (1) (OSD)			LOW Readings (OSD)(5,7)
	Watch List	High Heat			MT	FIC	ENRAF	Neutron
U-107	X			ENRAF	None	None		
U-108	X			LOW	None	None		
U-109	X			ENRAF	None	None		
U-110				None	None	None		None
U-111				LOW	None	None		
U-112				None		None	None	None
U-201				MT		None	None	None
U-202				MT		None	None	None
U-203				None	None	None		None
U-204				ENRAF	None	None		None
Catch Tanks and Special Surveillance Facilities								
A-302-A	N/A	N/A	N/A	(6)	None	None		None
A-302-B	N/A	N/A	N/A	(6)		None	None	None
ER-311	N/A	N/A	N/A	(6)	None		None	None
AX-152	N/A	N/A	N/A	(6)		None	None	None
AZ-151	N/A	N/A	N/A	(6)	None		None	None
AZ-154	N/A	N/A	N/A	(6)		None	None	None
BX-TK/SMP	N/A	N/A	N/A	(6)		None	None	None
A-244 TK/SMP	N/A	N/A	N/A	(6)	None	None	None	None
AR-204	N/A	N/A	N/A	(6)			None	None
A-417	N/A	N/A	N/A	(6)	None	None	None	None
A-350	N/A	N/A	N/A	(6)	None	None	None	None
CR-003	N/A	N/A	N/A	(6)	None	None	None	None
Vent Sta.	N/A	N/A	N/A	(6)		None	None	None
S-302	N/A	N/A	N/A	(6)	None	None		None
S-302-A	N/A	N/A	N/A	(6)	None		None	None
S-304	N/A	N/A	N/A	(6)	None	None		None
TX-302-B	N/A	N/A	N/A	(6)		None	None	None
TX-302-C	N/A	N/A	N/A	(6)	None	None		None
U-301-B	N/A	N/A	N/A	(6)	None	None		None
UX-302-A	N/A	N/A	N/A	(6)	None	None		None
S-141	N/A	N/A	N/A	(6)	O/S (1,2)	None	None	None
S-142	N/A	N/A	N/A	(6)	O/S (1,2)	None	None	None
Totals: 149 tanks	22 Watch List Tanks (4)	10 High Heat Tanks (4)	N/C: 0		N/C: 0	N/C: 0	N/C: 0	N/C: 0

TABLE A-5. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS -149 TANKS
(Sheet 5 of 6)

Footnotes:

1. All SSTs have either manual tape, FIC, or ENRAF surface level measuring devices. Some also have zip cords.

   ENRAF gauges are being installed to replace FICs (or sometimes manual tapes). The ENRAF gauges are being connected to TMACS, but many are currently being read manually from the field. See Table A-7 for list of ENRAF installations.

2. High heat tanks have active exhausters; psychrometrics can be taken in the high heat tanks. Psychrometric readings are taken on an "as needed" basis with the exception of tanks C-105 and C-106. Hanford Federal Facility Agreement and Consent Order," Washington State Department of Ecology, U. S. Environmental Protection Agency, and U. S. Department of Energy," Fourth Amendment 1994 (Tri-Party Agreement) requires psychrometric readings to be taken in C-105 and C-106 on a monthly frequency. **Tank C-105 exhauster was shut down for C-106 sluicing; but was back on line during parts of December and psychrometrics were performed on C-105 and C-106.** Also, SX-The farm now has psychrometrics taken monthly.

3. C-106 and SX-109 - these tanks are on both category lists (Watch List and high heat list) - C-106 is the only tank on the high heat list included on the High Heat Watch List; SX-109 is on the Hydrogen Watch List, and also on the high heat list (but not on the High Heat Watch List).

4. Temperature readings may be regulated by OSD or POP. Temperatures cannot be obtained in 13 low heat load tanks (see Table A-4). The OSD does not require readings or repair of out-of service thermocouples for the low heat load (≤40,000 Btu/h) tanks. However, the POP requires that attempts are to be made semiannually in January and July to obtain readings for these tanks. There are no in-waste temperatures for tanks AX-102 and B-103. The waste level in this tanks is lower than the lowest thermocouple in these trees.

   Temperatures for many tanks are monitored continuously by TMACS; see Table A-8, TMACS Monitoring Status.

5. Document WHC-OSD-T-151-00031, "Operating Specifications for Tank Farm Leak Detection," requires that single-shell tanks with the surface level measurement device contacting liquid, partial liquid, or floating crust surface, will be monitored for leak detection on a daily basis. Tanks with a solid surface will be monitored for leak detection on a weekly basis by taking neutron scan data from a Liquid Observation Well (LOW), if an LOW is present. Tanks with a solid surface but without LOWs will not be monitored for leak detection if the tank has been interim stabilized, until an LOW is installed. Non-interim-stabilized tanks will have drywell surveys taken as a backup on a monthly basis if surface or interstitial level measurement equipment is unavailable. The OSD specifies what leak detection methods are to be used for each tank, and the requirements if the readings are not taken on the required frequency or if equipment is out of service.

6. Leak detection for the catch tanks is performed by monitoring for the buildup of liquid in the secondary containment (for most tanks with secondary containment) or for decrease in the liquid level for those tanks without secondary containment or secondary containment monitoring.

   Catch tanks 240-S-302 and 241-S-302-A are monitored for intrusions only, and are not subject to leak detection monitoring requirements until liquid is present above the intrusion level.

   Weight Time Factor is the surface level measuring device currently used in A-417, A-350 and 244-A-Tank/Sump. DCRT CR-003 is inactive and measured in gallons.

7. Document WHC-SD-WM-TI-605, REV. 0, dated January 1994, describes the rationale for Liquid Observation Well (LOW) installation priority. This priority is based on tank leak status, tank surface condition, and tank stabilization status. Also included is a listing of tanks with the waste level being below two feet which have no

TABLE A-5. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS - 149 TANKS
(Sheet 6 of 6)

priority assigned because no effort will be made to install LOWs in the near future. LOW probes are unable to accurately monitor interstitial liquid levels less than two feet high.

Tanks which will not receive LOWs:

A-102	BX-101	C-201	T-106
A-104	BX-103	C-202	T-108
A-105	BX-105	C-203	T-109
AX-102	BX-106	C-204	TX-107
AX-104	BX-108	SX-110	TY-102
B-102	C-108	SX-113	TY-104
B-103	C-109	SX-115	TY-106
B-112	C-111	T-102	U-101
		T-103	U-112

Total - 34 Tanks

8. TX-105 - the riser has been removed; the LOW has not been monitored since January 1987. Liquid levels are being taken.

9. All drywell scans are done by request only, when required in addition to, or as a BACKUP for, a PRIMARY leak detection method, per OSD-T-151-00031. **Currently, there are only two tanks which require drywell scans (C-105 and C-106); these were taken monthly until sluicing began in November 1998. Drywell scans in these tanks are expected to be discontinued soon; the OSD is being rewritten**..

   Only two tank farms, A and SX, have laterals. There are currently no functioning laterals and no plans to prepare these for use.

10. AX-101 - LOW readings are taken by gamma sensors.

11. SX-101 - ENRAF data suspect: core sampling done - displacer sticks on top of crust or goes into hole. LOW is primary device. ENRAF was flushed and recalibrated September 1, 1998, and the reading was back to near normal. Data marked suspect since September 10, when readings began fluctuating daily from 163 inches to 169 inches (new baseline established November 19, 1998, at 166.0 inches). **Readings still suspect; fluctuating from 169.83 to 161.82 inches. ENRAF was flushed December 29, 1998, and readings are now at 161.82 inches. Engineering evaluating, may need to be rebaselined again**.

12. Catch Tanks S-141 and S-142 have no M.T. readings.

TABLE A-6. DOUBLE-SHELL TANKS MONITORING COMPLIANCE STATUS

28 TANKS (Sheet 1 of 2)

December 31, 1998

The following table indicates whether Double-Shell tank monitoring was in compliance with the requirements as specified in the applicable documents as of the last day of the applicable month.

NOTE:

Dome Elevation Surveys are not required for DSTs.

Psychrometrics and in-tank photos/videos are taken "as needed" (2)

LEGEND:	
(Shaded)	= In compliance with all applicable documentation
N/C	= Noncompliance with applicable documentation
FIC/ENRAF M.T.	= Surface level measurement devices
OSD	= OSD-T-151-0007, OSD-T-151-0031
None	= no M.T., FIC or ENRAF installed
O/S	= Out of Service
W.F.	= Weight Factor
Rad.	= Radiation

Tank Number	Watch List	Temperature Readings (3) (OSD)	Surface Level Readings (1) (OSD)			Radiation Readings		
						Leak Detection Pits (4) (OSD)		Annulus (OSD)
			M.T.	FIC	ENRAF	W.F.	Rad. (8)	
AN-101				None			(8)	
AN-102					None		(8)	
AN-103	X			None			(8)	
AN-104	X			None			(8)	
AN-105	X		O/S	None			(8)	
AN-106					None		(8)	
AN-107					None		(8)	
AP-101			O/S		None	O/S (9)	(8)	
AP-102					None	O/S (9)	(8)	
AP-103					None	O/S (9)	(8)	
AP-104			O/S		None	O/S (9)	(8)	
AP-105					None	O/S (9)	(8)	
AP-106					None	O/S (9)	(8)	
AP-107					None	O/S (9)	(8)	
AP-108					None	O/S (9)	(8)	
AW-101	X		O/S	None			(8)	
AW-102					(6)		(8)	
AW-103				None			(8)	
AW-104				None			(8)	
AW-105				None			(8)	
AW-106				None			(8)	
AY-101				None		O/S	(8)	(5)
AY-102				None	O/S		(8)	
AZ-101			O/S	None			(8)	(5)
AZ-102					None		(8)	(5)
SY-101	X		O/S	None			(8)	
SY-102				None			(8)	
SY-103	X			None		(7)	(8)	
Totals: 28 tanks	6 Watch List Tanks	N/C: 0	N/C: 0	N/C: 0	N/C: 0	N/C: 0	N/C: 0	N/C: 0

TABLE A-6. DOUBLE-SHELL TANKS MONITORING COMPLIANCE STATUS - 28 TANKS
(Sheet 2 of 2)

Footnotes:

1. Some double-shell tanks have both FIC and manual tape which is used when the FIC is out of service. Noncompliance (N/C) will be shown when no readings are obtained. ENRAF gauges are being installed to replace FICs. The ENRAF gauges are being connected to TMACS, but some are currently being read manually.

2. Psychrometric readings are taken on an "as needed" basis. No psychrometric readings are currently being taken in the double-shell tanks.

3. OSD specifies double-shell tank temperature limits, gradients, etc.

4. Applicable OSD and HNF-IP-0842, latest revisions, are used as guidelines for monitoring Leak Detection Pits. See also (8) below.

5. AY-101 and AZ-101/102 are monitored only by the annulus Leak Detection Probe Measurement device.

6. AW-102 has ENRAF, FIC and M.T. At some point the FIC will be removed.

7. SY-103 - CWF reading is above normal range of 24 inches.

8. USQ TF-97-0038, dated April 28, 1997, specifies discontinuing the use of leak detection pit radiation monitoring equipment in all double-shell tank farms where the leak detection pits are used as tertiary leak detection. This applies to all double-shell tank farms.

9. Weekly readings are being obtained by Instrument Technicians in these tanks:
   AP-103C (for tanks AP-101 - 104)
   AP-105C (for tanks AP-105 - 108)

TABLE A-7. ENRAF SURFACE LEVEL GAUGE INSTALLATION AND DATA INPUT METHODS

December 31, 1998

LEGEND		
	CASS	= Computer Automated Surveillance System
	SACS	= Surveillance Analysis Computer System
	TMACS	= Tank Monitor and Control System
	Auto	= Automatically entered into TMACS and electronically transmitted to SACS
	Manual	= EITHER manually entered into CASS by field operators and electronically transmitted to SACS OR manually entered directly into SACS by surveillance personnel, from Field Data sheets

EAST AREA						WEST AREA					
Tank No.	Installed Date	Input Method	Tank No.	Installed Date	Input Method	Tank No.	Installed Date	Input Method	Tank No.	Installed Date	Input Method
A-101	09/95	Auto	B-201			S-101	02/95	Manual	TX-101	11/95	Auto
A-102			B-202			S-102	05/95	Auto	TX-102	05/96	Auto
A-103	07/96	Auto	B-203			S-103	05/94	Auto	TX-103	12/95	Auto
A-104	05/96	Manual	B-204			S-104			TX-104	03/96	Auto
A-105			BX-101	04/96	Auto	S-105	07/95	Manual	TX-105	04/96	Auto
A-106	01/96	Auto	BX-102	06/96	Auto	S-106	06/94	Auto	TX-106	04/96	Auto
AN-101	08/96	Auto	BX-103	04/96	Auto	S-107	06/94	Auto	TX-107	04/96	Auto
AN-102			BX-104	05/96	Auto	S-108	07/95	Manual	TX-108	04/96	Auto
AN-103	08/95	Auto	BX-105	03/96	Auto	S-109	08/95	Manual	TX-109	11/95	Auto
AN-104	08/95	Auto	BX-106	07/94	Auto	S-110	08/95	Manual	TX-110	05/96	Auto
AN-105	08/95	Auto	BX-107	06/96	Auto	S-111	08/94	Auto	TX-111	05/96	Auto
AN-106			BX-108	05/96	Auto	S-112	05/95	Auto	TX-112	05/96	Auto
AN-107			BX-109	08/95	Auto	SX-101	04/95	Auto	TX-113	05/96	Auto
AP-101			BX-110	06/96	Auto	SX-102	04/95	Auto	TX-114	05/96	Auto
AP-102			BX-111	05/96	Auto	SX-103	04/95	Auto	TX-115	05/96	Auto
AP-103			BX-112	03/96	Auto	SX-104	05/95	Auto	TX-116	05/96	Auto
AP-104			BY-101			SX-105	05/95	Auto	TX-117	06/96	Auto
AP-105			BY-102			SX-106	08/94	Auto	TX-118	03/96	Auto
AP-106			BY-103	12/96	Manual	SX-107			TY-101	07/95	Auto
AP-107			BY-104			SX-108			TY-102	09/95	Auto
AP-108			BY-105			SX-109	09/98	Auto	TY-103	09/95	Auto
AW-101	08/95	Auto	BY-106			SX-110			TY-104	06/95	Auto
AW-102	05/96	Auto	BY-107			SX-111			TY-105	12/95	Auto
AW-103	05/96	Auto	BY-108			SX-112			TY-106	12/95	Auto
AW-104	01/96	Auto	BY-109			SX-113			U-101		
AW-105	06/96	Auto	BY-110	2/97	Manual	SX-114			U-102	01/96	Manual
AW-106	06/96	Auto	BY-111	2/97	Manual	SX-115			U-103	07/94	Auto
AX-101	09/95	Auto	BY-112			SY-101	07/94	Auto	U-104		
AX-102	09/98	Manual	C-101			SY-102	06/94	Manual	U-105	07/94	Auto
AX-103	09/95	Auto	C-102			SY-103	07/94	Auto	U-106	08/94	Auto
AX-104	10/96	Auto	C-103	08/94	Auto	T-101	05/95	Manual	U-107	08/94	Auto
AY-101	03/96	Manual	C-104			T-102	06/94	Auto	U-108	05/95	Auto
AY-102	01/98	Auto	C-105	05/96	Manual	T-103	07/95	Manual	U-109	07/94	Auto
AZ-101	08/96	Manual	C-106	02/96	Auto	T-104	12/95	Manual	U-110	01/96	Manual
AZ-102			C-107	04/95	Auto	T-105	07/95	Manual	U-111	01/96	Manual
B-101			C-108			T-106	07/95	Manual	U-112		
B-102	02/95	Manual	C-109			T-107	06/94	Auto	U-201		
B-103			C-110			T-108	10/95	Manual	U-202		
B-104			C-111			T-109	09/94	Manual	U-203	09/98	Manual
B-105			C-112	03/96	Manual	T-110	05/95	Auto	U-204	6/98	Manual
B-106			C-201			T-111	07/95	Manual			
B-107			C-202			T-112	09/95	Manual			
B-108			C-203			T-201					
B-109			C-204			T-202					
B-110						T-203					
B-111						T-204					
B-112	03/95	Manual									
Total East Area: 43						Total West Area: 69					

112 ENRAFs installed: 80 automatically entered into TMACS, 32 manually entered into CASS

TABLE A-8. TANK MONITOR AND CONTROL SYSTEM (TMACS)

December 31, 1998

Note: Indicated below are the number of tanks having at least one operating sensor (some tanks have more than one sensor: multiple sensors of the same type in a tank are not shown in the table) for example: 10 tanks in BY-Farm have at least one operating TC sensor and 3 tanks in BY-Farm have at least one operating RTD sensor.

Acceptance Testing Completed: Sensors Automatically Monitored by TMACS

EAST AREA Tank Farm	Temperatures Thermocouple Tree (TC)	Temperatures Resistance Thermal Device (RTD)	ENRAF Level Gauge	Pressure (b)	Hydrogen (c)	Gas Sample Flow
A-Farm (6 Tanks)	1		3		1	1
AN-Farm (7 Tanks)	7		4	7	3	3
AP-Farm (8 Tanks)						
AW-Farm (6 Tanks)	6		6		1	1
AX-Farm (4 Tanks)	3		3		(d)	
AY-Farm (2 Tanks)			1			
AZ-Farm (2 Tanks)						
B-Farm (16 Tanks)	1					
BX-Farm (12 Tanks)	11		12			
BY-Farm (12 Tanks)	10	3				
C-Farm (16 Tanks)	15	1	3	1		
TOTAL EAST AREA (91 Tanks)	54	4	32	8	5	5
WEST AREA						
S-Farm (12 Tanks)	12		6	1	3	3
SX-Farm (15 Tanks)	14		7	1	7	7
SY-Farm (3 Tanks) (a)	3		2	1	2	2
T-Farm (16 Tanks)	14	1	3		1	1
TX-Farm (18 Tanks)	13		18			
TY-Farm (6 Tanks)	6	3	6			
U-Farm (16 Tanks)	15		6	4	6	6
TOTAL WEST AREA (86 Tanks)	81	4	48	7	18	18
TOTALS (177 Tanks)	131	8	80	15	23	23

(a) Tank SY-101 has 2 gas sample flow sensors plus 2 vent flow sensors, and 2 ENRAFs.
(b) Each tank has low and high range sensors (9x2=18 sensors)
(c) Each tank has low and high range sensors (17x2=34 sensors)
(d) AX-101 Hydrogen was ATP'd in TMACS on September 21, 1998, but not transmitting yet - lines plugged.

APPENDIX B

DOUBLE SHELL TANK WASTE TYPE AND SPACE ALLOCATION

TABLE B-1. DOUBLE-SHELL TANK WASTE TYPE AND SPACE ALLOCATION

DECEMBER 1998

DOUBLE-SHELL TANK INVENTORY BY WASTE TYPE		SPACE DESIGNATED FOR SPECIFIC USE	
Complexed Waste (AN-102, AN-106, AN-107, SY-101, SY-103, (AY-101 , AP-108 (DC))	3.97 Mgal	Spare Tanks (3) (1 Aging & 1 Non-Aging Waste Tank)	2.28 Mgal
Concentrated Phosphate Waste (AP-102)	1.09 Mgal	Watch List Tank Space (AN-103, AN-104, AN-105, AW-101, SY-101, SY-103)	0.67 Mgal
Double-Shell Slurry and Slurry Feed (AN-103, AN-104, AN-105, AP-101, AW-101, AW-106)	4.4 Mgal	Segregated Tank Space (AN-102, AN-107, AP-102, AZ-101, AZ-102	0.43 Mgal
Aging Waste (NCAW) at 5M Na Dilute in Aging Tanks (AZ-101, AZ-102)	1.23 Mgal 0.37 Mgal	Receiver/Operational Tank Space (2) (AP-106, AP-108, AW-102, AW-106, SY-102)	2.94 Mgal
Dilute Waste (1) (AN-101, AP-103, AP-105, AP-104, AP-106, AP-107, AW-102, AW-103, AW-104, AW-105, AY-102, SY-102)	3.65 Mgal	Total Specific Use Space (12/31/98)	6.32 Mgal
		TOTAL DOUBLE-SHELL TANK SPACE	
NCRW, PFP and DST Settled Solids (All DST's)	4.04 Mgal	24 Tanks at 1140 Kgal 4 Tanks at 980 Kgal	27.36 Mgal 3.92 Mgal 31.28 Mgal
Total Inventory=	18.75 Mgal	Total Available Space Double-Shell Tank Inventory Space Designated for Specific Use Remaining Unallocated Space	31.28 Mgal 18.75 Mgal 6.32 Mgal 6.21 Mgal

(1) Was reduced in volume by -0.00 Mgal this month (Evaporator WVR)
(2) Tank Space Reduced by Facility Generations and Saltwell Liquid pumping
(3) 241-AY-101: A minumum liquid level is set to provide extra protection against any bottom uplifting of the tank's steel liner. Because of space availablility, waste is stored in AY-102, the aging waste spare tank. In case of a leak the contents of AY-102 will be distributed to any other DST(s) having available space.

Note: Net change in total DST inventory since last month: +0.006 Mgal

Table B-2. Double Shell Tank Waste Inventory for December 31, 1998

TANKS	INVENTORY	SOLIDS	TYPE	LEFT
AN-101=	158	33	DN	982
AN-102=	1064	89	CC	76
AN-103=	957	410	DSS	183
AN-104=	1053	449	DSSF	87
AN-105=	1126	489	DSSF	14
AN-106=	39	17	CC	1101
AN-107=	1047	247	CC	93
AP-101=	1115	0	DSSF	25
AP-102=	1093	0	CP	47
AP-103=	24	1	DN	1116
AP-104=	24	0	DN	1116
AP-105=	766	89	DSSF	374
AP-106=	389	0	DN	751
AP-107=	22	0	DN	1118
AP-108=	254	0	DC	886
AW-101=	1125	306	DSSF	15
AW-102=	591	40	DN	549
AW-103=	511	347	NCRW	629
AW-104=	1119	231	DN	21
AW-105=	432	280	NCRW	708
AW-106=	580	228	CC	560
AY-101=	167	108	DC	813
AY-102=	463	32	DN	517
AZ-101=	849	47	NCAW	131
AZ-102=	898	104	NCAW	82
SY-101=	1170	41	CC	-30
SY-102=	974	88	DN/PT	166
SY-103=	740	362	CC	400
TOTAL=	18750	4038		12530

NOTE: Solids Adjusted to Most Current Available Data
NOTE: All Volumes in Kilo-Gallons (Kgals)

TOTAL DST SPACE AVAILABLE	
NON-AGING =	27360
AGING =	3920
TOTAL=	31280

DST INVENTORY CHANGE	
11/98 TOTAL	18744
12/98 TOTAL	18750
INCREASE	6

WATCH LIST SPACE	
AN-103=	183
AN-104=	87
AN-105=	14
AW-101=	15
SY-101=	-30
SY-103=	400
TOTAL=	669

SEGREGATED SPACE (CC,CP,AW)	
AN-102=	76
AN-107=	93
AP-102=	47
AZ-101=	131
AZ-102=	82
TOTAL=	429

WASTE RECEIVER SPACE	
AP-106 (200E/DN)=	751
AP-108 (200E/DN)=	886
SY-102 (200W/DN)=	166
TOTAL=	1803

USABLE SPACE	
AN-101=	982
AN-106=	1101
AP-101=	25
AP-103=	1116
AP-104=	1116
AP-105=	374
AP-107=	1118
AW-102=	549
AW-103=	629
AW-104=	21
AW-105=	708
AW-106=	560
AY-101=	813
AY-102=	517
TOTAL=	9629
EVAP. OPERATIONS	-1140
SPARE SPACE	-2280
USABLE LEFT=	6209

USABLE SPACE CHANGE	
11/98 TOTAL SPACE	3306
12/98 TOTAL SPACE	6209
CHANGE=	2903

WASTE RECEIVER SPACE CHANGE	
11/98 TOTAL SPACE	1920
12/98 TOTAL SPACE	1803
CHANGE=	-117

Inventory Calculation by Waste Type:

COMPLEXED WASTE	
AN-102=	975 (CC)
AN-106=	22 (CC)
AN-107=	800 (CC)
AP-108=	254 (DC)
AW-106=	352 (CC)
AY-101=	59 (DC)
SY-101=	1129 (CC)
SY-103=	376 (CC)
TOTAL DC/CC=	3969
TOTAL SOLIDS=	1092

NCRW SOLIDS (PD)	
AW-103=	347
AW-105=	280
TOTAL=	627

PFP SOLIDS (PT)	
SY-102=	88
TOTAL=	88

CONCENTRATED PHOSPHATE (CP)	
102-AP=	1093
TOTAL=	1093

DILUTE WASTE (DN)	
AN-101=	125
AP-103=	23
AP-104=	24
AP-106=	389
AP-107=	22
AW-102=	551
AW-103=	164
AW-104=	888
AW-105=	152
AY-102=	431
SY-102=	886
TOTAL DN=	3655
TOTAL SOLIDS=	337

NCAW (AGING WASTE) (@ 5M Na)	
AZ-101=	791
AZ-102=	434
TOTAL @ ~5M Na=	1225
TOTAL DN=	371
TOTAL SOLIDS=	151

DSS/DSSF	
AN-103=	547
AN-104=	604
AN-105=	637
AP-101=	1115
AP-105=	677
AW-101=	819
TOTAL DSS/DSSF=	4399
TOTAL SOLIDS=	1743

GRAND TOTALS	
NCRW SOLIDS=	627
DST SOLIDS=	3172
PFP SOLIDS=	88
AGING SOLIDS=	151
CC=	3656
DC=	313
CP=	1093
NCAW=	1596
DSS/DSSF=	4399
DILUTE=	3655
TOTAL=	18750

NOTE: Tank AW-106 (evaporator receiver) has Concentrated Complexed (CC) waste in it and will be transferred to Tank 106-AN.

Table B-2. Double Shell Tank Waste Inventory for December 31, 1998

TOTAL AVAILABLE SPACE AS OF DECEMBER 31, 1998:			12530 KGALS
WATCH LIST TANK SPACE:	**TANK**	**WASTE TYPE**	**AVAILABL SPACE**
Unusable DST Headspace - Due to Special Restrictions Placed on the Tanks, as Stated in the "Wyden Bill"	AN-103	DSS	183 KGALS
	AN-104	DSSF	87 KGALS
	AN-105	DSSF	14 KGALS
	AW-101	DSSF	15 KGALS
	SY-101	CC	-30 KGALS
	SY-103	CC	400 KGALS
		TOTAL=	669 KGALS
		AVAILABLE TANK SPACE=	12530 KGALS
		MINUS WATCH LIST SPACE=	-669 KGALS
TOTAL AVAILABLE SPACE AFTER WATCH LIST SPACE DEDUCTIONS=			11861 KGALS
SEGREGATED TANK SPACE:	**TANK**	**WASTE TYPE**	**AVAILABL SPACE**
DST Headspace Available to Store Only Specific Waste Types			
	AN-102	CC	76 KGALS
	AN-107	CC	93 KGALS
	AP-102	CP	47 KGALS
	AZ-101	AW	131 KGALS
	AZ-102	AW	82 KGALS
		TOTAL=	429 KGALS
		AVAILABLE SPACE AFTER WATCH LIST DEDUCTIONS=	11861 KGALS
		MINUS SEGREGATED SPACE=	-429 KGALS
TOTAL AVAILABLE SPACE AFTER SEGREGATED SPACE DEDUCTIONS=			11432 KGALS
USABLE/WASTE RECEIVER TANK SPACE:	**TANK**	**WASTE TYPE**	**AVAILABL SPACE**
DST Headspace Available to Store Facility Generated and Evaporator Product Waste	AN-101	DN	982 KGALS
	AN-106	CC	1101 KGALS
	AP-101	DSSF	25 KGALS
	AP-103	DN	1116 KGALS
	AP-104	DN	1116 KGALS
	AP-105	DSSF	374 KGALS
FACILITY WASTE RECEIVER TANK	AP-106	DN	751 KGALS
	AP-107	DN	1118 KGALS
FACILITY WASTE RECEIVER TANK	AP-108	DC	886 KGALS
EVAPORATOR FEED TANK	AW-102	DN	549 KGALS
	AW-103	NCRW	629 KGALS
	AW-104	DN	21 KGALS
	AW-105	NCRW	708 KGALS
EVAPORATOR RECEIVER TANK	AW-106	CC	560 KGALS
	AY-101	DC	813 KGALS
	AY-102	DN	517 KGALS
FACILITY WASTE RECEIVER TANK	SY-102	DN	166 KGALS
		TOTAL AVAILABLE USABLE TANK SPACE=	11432 KGALS
EVAPORATOR OPERATIONAL TANK SPACE:			-1140 KGALS
SPARE TANK SPACE:	*(DOE Order 5820.2A)*		-2280 KGALS
TOTAL TANK SPACE AVAILABLE AFTER ALL DEDUCTIONS=			8012 KGALS

SEG1298

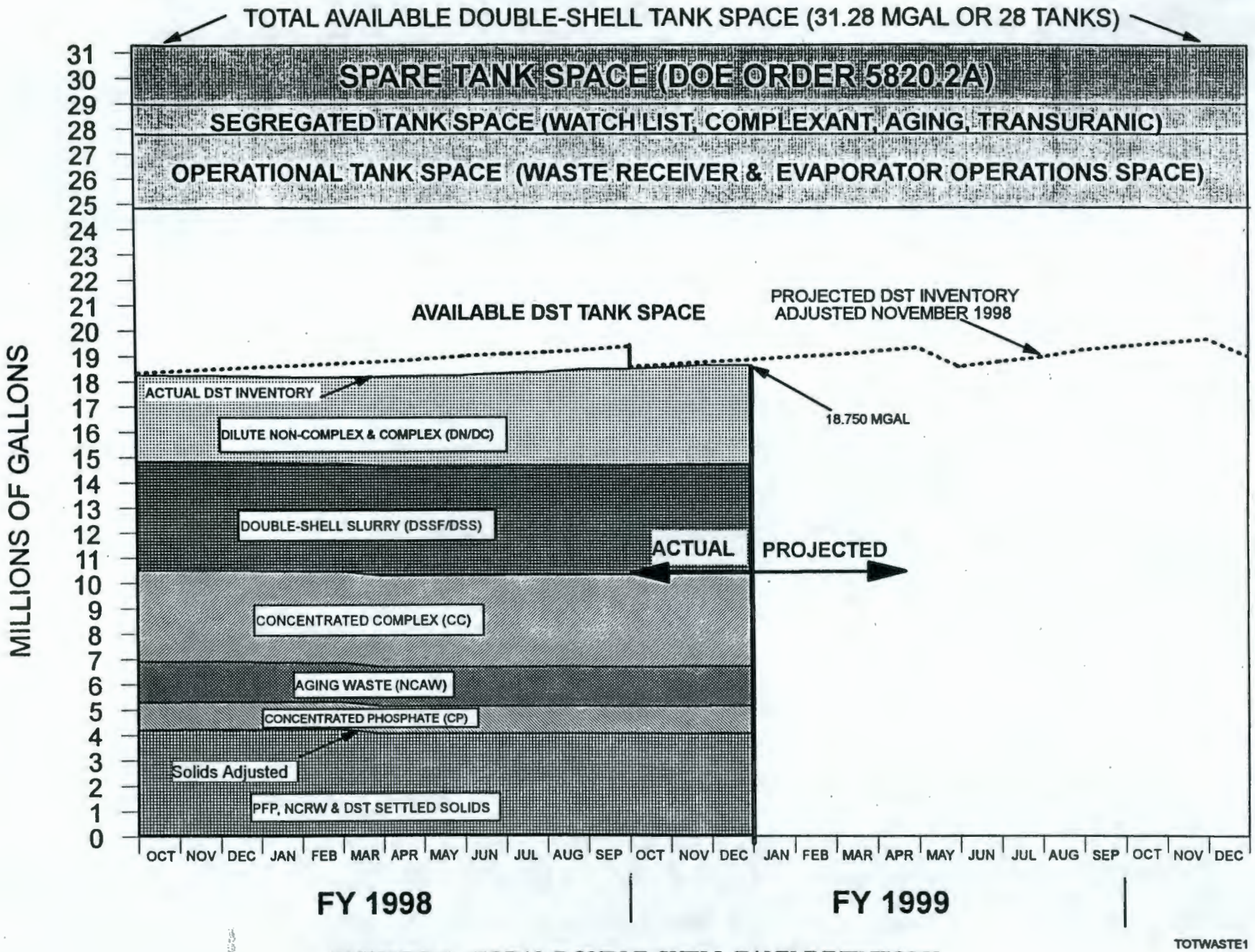

FIGURE B-1. TOTAL DOUBLE-SHELL TANK INVENTORY

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APPENDIX C

TANK AND EQUIPMENT CODE AND STATUS DEFINITIONS

C. TANK AND EQUIPMENT CODE/STATUS DEFINITIONS

December 31, 1998

1. TANK STATUS CODES

WASTE TYPE (also see definitions, section 3)

AGING	Aging Waste (Neutralized Current Acid Waste [NCAW])
CC	Complexant Concentrate Waste
CP	Concentrated Phosphate Waste
DC	Dilute Complexed Waste
DN	Dilute Non-Complexed Waste
DSS	Double-Shell Slurry
DSSF	Double-Shell Slurry Feed
NCPLX	Non-Complexed Waste
PD/PN	Plutonium-Uranium Extraction (PUREX) Neutralized Cladding Removal Waste (NCRW), transuranic waste (TRU)
PT	Plutonium Finishing Plant (PFP) TRU Solids

TANK USE (DOUBLE-SHELL TANKS ONLY)

CWHT	Concentrated Waste Holding Tank
DRCVR	Dilute Receiver Tank
EVFD	Evaporate Feed Tank
SRCVR	Slurry Receiver Tank

2. SOLID AND LIQUID VOLUME DETERMINATION METHODS

F	Food Instrument Company (FIC) Automatic Surface Level Gauge
E	ENRAF Surface Level Gauge (being installed to replace FICs)
M	Manual Tape Surface Level Gauge
P	Photo Evaluation
S	Sludge Level Measurement Device

3. DEFINITIONS

WASTE TANKS - GENERAL

Waste Tank Safety Issue

A potentially unsafe condition in the handling of waste material in underground storage tanks that requires corrective action to reduce or eliminate the unsafe condition.

Watch List Tank

An underground storage tank containing waste that requires special safety precautions because it may have a serious potential for release of high level radioactive waste because of uncontrolled increases in temperature or pressure. Special restrictions have been placed on these tanks by "Safety Measures for Waste Tanks at Hanford Nuclear Reservation," Section 3137 of the *National Defense Authorization Act for Fiscal Year 1991*, November 5, 1990, Public Law 101-510, (also known as the Wyden Amendment).

Characterization

Characterization is understanding the Hanford tank waste chemical, physical, and radiological properties to the extent necessary to insure safe storage and interim operation, and ultimate disposition of the waste.

WASTE TYPES

Aging Waste (AGING)
High level, first cycle solvent extraction waste from the PUREX plant (NCAW)

Concentrated Complexant (CC)
Concentrated product from the evaporation of dilute complexed waste.

Concentrated Phosphate Waste (CP)
Waste originating from the decontamination of the N Reactor in the 100 N Area. Concentration of this waste produces concentrated phosphate waste.

Dilute Complexed Waste (DC)
Characterized by a high content of organic carbon including organic complexants: ethylenediaminetetra-acetic acid (EDTA), citric acid, and hydroxyethyl-ethylenediaminetriacetic acid (HEDTA), being the major complexants used. Main sources of DC waste in the DST system are saltwell liquid inventory (from SSTs).

Dilute Non-Complexed Waste (DN)
Low activity liquid waste originating from T and S Plants, the 300 and 400 Areas, PUREX facility (decladding supernatant and miscellaneous wastes), 100 N Area (sulfate waste), B Plant, saltwells, and PFP (supernate).

Double-Shell Slurry (DSS)
Waste that exceeds the sodium aluminate saturation boundary in the evaporator without exceeding receiver tank composition limits. For reporting purposes, DSS is considered a solid.

Double-Shell Slurry Feed (DSSF)
Waste concentrated just before reaching the sodium aluminate saturation boundary in the evaporator without exceeding receiver tank composition limits. This form is not as concentrated as DSS.

Non-complexed (NCPLX)
General waste term applied to all Hanford Site (NCPLX) liquors not identified as complexed.

PUREX Decladding (PD)
PUREX Neutralized Cladding Removal Waste (NCRW) is the solids portion of the PUREX plant neutralized cladding removal waste stream; received in Tank Farms as a slurry. NCRW solids are classified as transuranic (TRU) waste.

PFP TRU Solids (PT)
TRU solids fraction from PFP Plant operations.

Drainable Interstitial Liquid (DIL)
Interstitial liquid that is not held in place by capillary forces, and will therefore migrate or move by gravity. (See also Section 4 below – page C-7)

Supernate
The liquid above the solids in waste storage tanks. (See also Section 4 below – page C-7)

Ferrocyanide
A compound of iron and cyanide commonly expressed as FeCN. The actual formula for the ferrocyanide anion is $[Fe(CN)_6]^{-4}$.

INTERIM STABILIZATION (Single-Shell Tanks only)

Interim Stabilized (IS)

A tank which contains less than 50 Kgallons of drainable interstitial liquid and less than 5 Kgallons of supernatant liquid. If the tank was jet pumped to achieve interim stabilization, then the jet pump flow must also have been at or below 0.05 gpm before interim stabilization criteria is met.

Jet Pump

The jet pump system includes 1) a jet assembly with foot valve mounted to the base of two pipes that extend from the top of the well to near the bottom of the well casing inside the saltwell screen, 2) a centrifugal pump to supply power fluid to the down-hole jet assembly, 3) flexible or rigid transfer jumpers, 4) a flush line, and 5) a flowmeter. The jumpers contain piping, valves, and pressure and limit switches.

The centrifugal pump and jet assembly are needed to pump the interstitial liquid from the saltwell screen into the pump pit, nominally a 40-foot elevation rise. The power fluid passes through a nozzle in the jet assembly and acts to convert fluid pressure head to velocity head, thereby reducing the pressure in the jet assembly chamber. The reduction in pressure allows the interstitial liquid to enter the jet assembly chamber and mix with the power fluid. Velocity head is converted to pressure head above the nozzle, lifting power fluid, and interstitial liquid to the pump pit. Pumping rates vary from 0.05 gallons to about 4 gpm.

Saltwell Screen

The saltwell system is a 10-inch diameter saltwell casing consisting of a stainless steel saltwell screen welded to a Schedule 40 carbon steel pipe. The casing and screen are to be inserted into the 12-inch tank riser located in the pump pit. The stainless steel screen portion of the system will extend through the tank waste to near the bottom of the tank. The saltwell screen portion of the casing is an approximately 10-foot length of 300 Series, 10-inch diameter, stainless steel pipe with screen openings (slots) of 0.05 inches.

Emergency Pumping Trailer

A 45-foot tractor-type trailer is equipped to provide storage space and service facilities for emergency pumping equipment: this consists of two dedicated jet pump jumpers and two jet pumps, piping and dip tubes for each, two submersible pumps and attached piping, and a skid-mounted Weight Factor Instrument Enclosure (WFIE) with an air compressor and electronic recording instruments. The skid also contains a power control station for the pumps, pump pit leak detection, and instrumentation. A rack for over 100 feet of overground double-contained piping is also in the trailer.

INTRUSION PREVENTION (ISOLATION) Single-Shell Tanks only

Partially Interim Isolated (PI)

The administrative designation reflecting the completion of the physical effort required for Interim Isolation except for isolation of risers and piping that is required for jet pumping or for other methods of stabilization.

Interim Isolated (II)

The administrative designation reflecting the completion of the physical effort required to minimize the addition of liquids into an inactive storage tank, process vault, sump, catch tank, or diversion box. In June 1993, Interim Isolation was replaced by Intrusion Prevention.

Intrusion Prevention (IP)

Intrusion Prevention is the administrative designation reflecting the completion of the physical effort required to minimize the addition of liquids into an inactive storage tank, process vault, sump, catch tank, or diversion box. Under no circumstances are electrical or instrumentation devices disconnected or disabled during the intrusion prevention process (with the exception of the electrical pump).

Controlled, Clean, and Stable (CCS)

Controlled, Clean, and Stable reflects the completion of several objectives: "Controlled" - provide remote monitoring for required instrumentation and implement controls required in the TWRS Authorization Basis; "Clean" - remove surface soil contamination and downpost the Tank Farms to RBA/URMA/RA radiological control status, remove abandoned equipment, and place reusuable equipment in compliant storage; and "Stable" - remove pumpable liquids from the SSTs and IMUSTs and isolate the tanks.

TANK INTEGRITY

Sound

The integrity classification of a waste storage tank for which surveillance data indicate no loss of liquid attributed to a breach of integrity.

Assumed Leaker

The integrity classification of a waste storage tank for which surveillance data indicate a loss of liquid attributed to a breach of integrity.

Assumed Re-Leaker

A condition that exists after a tank has been declared as an "assumed leaker" and then the surveillance data indicates a new loss of liquid attributed to a breach of integrity.

TANK INVESTIGATION

Intrusion

A term used to describe the infiltration of liquid into a waste tank.

SURVEILLANCE INSTRUMENTATION

Drywells

Drywells are vertical boreholes with 6-inch (internal diameter) carbon steel casings positioned radially around SSTs. These wells range between 50 and 250 feet in depth, and are monitored between the range of 50 to 150 feet. The wells are sealed when not in use. They are called drywells because they do not penetrate to the water table and are therefore usually "dry." There are 759 drywells.

Monitoring is done by gamma radiation or neutron-moisture sensors to obtain scan profiles of radiation or moisture in the soil as a function of well depth, which could be indicative of tank leakage.

Two single-shell tanks (C-105 and C-106) are currently monitored monthly by gamma radiation sensors. The remaining drywells are monitored on request by gamma radiation sensors. Monitoring by neutron-moisture sensors is done only on request.

Laterals

Laterals are horizontal drywells positioned under single-shell waste storage tanks to detect radionuclides in the soil which could be indicative of tank leakage. These drywells can be monitored by radiation detection probes. Laterals are 4-inch inside diameter steel pipes located 8 to 10 feet below the tank's concrete base. There are three laterals per tank. Laterals are located only in A and SX farms. There are currently no functioning laterals and no plan to prepare them for use.

Surface Levels

The surface level measurements in all waste storage tanks are monitored by manual or automatic conductivity probes, and recorded and transmitted or entered into the Computer Automated Surveillance System (CASS).

Automatic FIC

An automatic waste surface level measurement device is manufactured by the Food Instrument Company (FIC). The instrument consists of a conductivity electrode (plummet) connected to a calibrated steel tape, a steel tape

reel housing and a controller that automatically raises and lowers the plummet to obtain a waste surface level reading. The controller can provide a digital display of the data and also transmit the reading to the CASS. Some tanks have gauges connected to CASS and others are read manually. FICs are being replaced by ENRAF detectors (see below).

ENRAF 854 ATG Level Detector

FICs and some manual tapes are in the process of being replaced by the ENRAF ATG 854 level detector. The ENRAF gauge, fabricated by ENRAF Incorporated, determines waste level by detecting variations in the weight of a displacer suspended in the tank waste. The displacer is connected to a wire wound onto a precision measuring drum. A level causes a change in the weight of the displacer which will be detected by the force transducer. Electronics within the gauge causes the servo motor to adjust the position of the displacer and compute the tank level based on the new position of the displacer drum. The gauge displays the level in decimal inches. The first few ENRAFs that received remote reading capability transmit liquid level data via analog output to the Tank Monitor and Control System (TMACS). The remaining ENRAFs and future installations will transmit digital level data to TMACS via an ENRAF Computer Interface Unit (CIU). The CIU allows fully remote communication with the gauge, minimizing tank farm entry.

Annulus

The annulus is the space between the inner and outer shells on DSTs only. Drain channels in the insulating and/or supporting concrete carry any leakage to the annulus space where conductivity probes are installed. Alarms from the annunciators are received by CASS. Continuous Air Monitoring (CAM) alarms are also located in the annulus. The annulus conductivity probes and radiation detectors are the primary means of leak detection for all DSTs.

Liquid Observation Well (LOW)

In-tank liquid observation wells are used for monitoring the interstitial liquid level (ILL) in single-shell waste storage tanks. The wells are usually constructed of fiberglass or TEFZEL-reinforced epoxy-polyester resin (TEFZEL, a trademark of E. I. du Pont de Nemours & Company). There are a few LOWs constructed of steel. LOWs are sized to extend to within 1 inch of the bottom of the waste tank, are sealed at their bottom ends and have a nominal outside diameter of 3.5 inches. Two probes are used to monitor changes in the ILL; gamma and neutron, which can indicate intrusions or leakage by increases or decreases in the ILL. There are 65 LOWs (64 are in operation) installed in SSTs that contain or are capable of containing greater than 50 Kgallons of drainable interstitial liquid, and in two DSTs only. The LOWs installed in two DSTs, (SY-102 and AW-103 tanks), are used for special, rather than routine, surveillance purposes only.

Thermocouple (TC)

A thermocouple is a thermoelectric device used to measure temperature. More than one thermocouple on a device (probe) is called a thermocouple tree. In DSTs there may be one or more thermocouple trees in risers in the primary tank. In addition, in DSTs only, there are thermocouple elements installed in the insulating concrete, the lower primary tank knuckle, the secondary tank concrete foundation, and in the outer structural concrete.

These monitor temperature gradients within the concrete walls, bottom of the tank, and the domes. In SSTs, one or more thermocouples may be installed directly in a tank, although some SSTs do not have any trees installed. A single thermocouple (probe) may be installed in a riser, or lowered down an existing riser or LOW. There are also four thermocouple laterals beneath Tank 105-A in which temperature readings are taken in 34 thermocouples.

In-tank Photographs and Videos

In-tank photographs and videos may be taken to aid in resolving in-tank measurement anomalies and determine tank integrity. Photographs and videos help determine sludge and liquid levels by visual examination.

TERMS/ACRONYMS

CASS Computer Automated Surveillance System

CCS Controlled, Clean and Stable (tank farms)

II Interim Isolated

IP Intrusion Prevention Completed

IS Interim Stabilized

MT/FIC/ENRAF Manual Tape, Food Instrument Corporation, ENRAF Corporation (surface level measurement devices)

OSD Operating Specifications Document

PI Partial Interim Isolated

SAR Safety Analysis Reports

SHMS Standard Hydrogen Monitoring System

TMACS Tank Monitor and Control System

TPA Hanford Federal Facility Consent and Compliance Order, "Washington State Department of Ecology, U. S. Environmental Protection Agency, and U. S. Department of Energy," Fourth Amendment, 1994 (Tri-Party Agreement)

USQ Unreviewed Safety Question

Wyden Amendment "Safety Measures for Waste Tanks at Hanford Nuclear Reservation," Section 3137 of the National Defense Authorization Act for Fiscal Year 1991, November 5, 1990, Public Law 101- 510.

4. INVENTORY AND STATUS BY TANK - VOLUME CALCULATIONS AND DEFINITIONS FOR TABLE E-6 (SINGLE-SHELL TANKS)

COLUMN HEADING	VOLUME CALCULATIONS/DEFINITIONS
Total Waste	Solids volume plus Supernatant liquid. Solids include sludge and saltcake (see definitions below)
Supernate Liquid	Drainable Liquid Remaining minus Drainable Interstitial. Supernate is the clear liquid floating on the surface of the waste. Supernate is usually derived by subtracting the solids level measurement from the liquid level measurement. In some cases, the supernatant volume includes floating solid crusts because their volume cannot be measured. In-tank photographs or videos are useful in estimating the liquid volumes; the area of solids covered and the average depth can be estimated.
Drainable Interstitial Liquid	Drainable Liquid Remaining minus Supernate. Drainable interstitial liquid is calculated based on the saltcake and sludge volumes, using average porosity values or actual data for each tank, when available. Interstitial liquid is liquid that fills the interstitial spaces of the solids waste. Drainable interstitial liquid is calculated based on the saltcake and sludge volumes in the tank. The sum of the interstitial liquid contained in saltcake and sludge is the initial volume of drainable interstitial liquid. The volume reported as Drainable Interstitial

COLUMN HEADING	VOLUME CALCULATIONS/DEFINITIONS
	Liquid is the initial volume of drainable interstitial liquid minus interstitial liquid removed by pumping.
Pumped This Month	Net total gallons of liquid pumped from the tank during the month. If supernate is present, pump production is first subtracted from the supernatant volume. The remainder is then subtracted from the drainable interstitial liquid volume. The total pumped volume is subtracted from drainable liquid remaining and pumpable liquid remaining. Pump production takes into account the amount of water added to the tank during the month (if any).
Total Pumped	Cumulative net total gallons of liquid pump from 1979 to date.
Drainable Liquid Remaining	Supernate plus Drainable Interstitial. (See Supernatant Liquid and Drainable Interstitial Liquid above for definitions). The total Drainable Liquid Remaining is the sum of drainable interstitial liquid and supernate minus total gallons pumped.
Pumpable Liquid Remaining	Drainable Liquid Remaining minus undrainable heel volume. (Dish bottom tanks have a "heel" where liquids can collect: flat bottom tanks do not). (See Drainable Liquid Remaining and Pumped this Month for definitions). Not all drainable interstitial liquid is pumpable. It is assumed that drainable interstitial liquid on top of the undrainable heel in sludge or saltcake, is not jet pumpable. Therefore, pumpable interstitial liquid is the initial volume of drainable interstitial liquid minus the amount of interstitial liquid on top of the heel. The volume shown as Pumpable Liquid Remaining is the sum of pumpable interstitial liquid and supernate minus total gallons pumped.
Sludge	Solids formed during sodium hydroxide additions to waste. Sludge usually was in the form of suspended solids when the waste was originally received in the tank from the waste generator. In-tank photographs or videos may be used to estimate the volume.
Saltcake	Results from crystallization and precipitation after concentration of liquid waste, usually in an evaporator. If saltcake is layered over sludge, it is only possible to measure total solids volume. In-tank photographs or videos may be used to estimate the saltcake volume.
Solids Volume Update	Indicates the latest update of any change in the solids volume.
Solids Update Source - See Footnote	Indicates the source or basis of the latest solids volume update.
Last In-tank Photo	Date of last in-tank photographs taken.
Last In-tank Video	Date of last in-tank video taken.
See Footnotes for These Changes	Indicates any change made the previous month. A footnote explanation for the change follows the Inventory and Status by Tank section (Table E-6).

APPENDIX D

TANK FARM CONFIGURATION, STATUS, AND FACILITY CHARTS

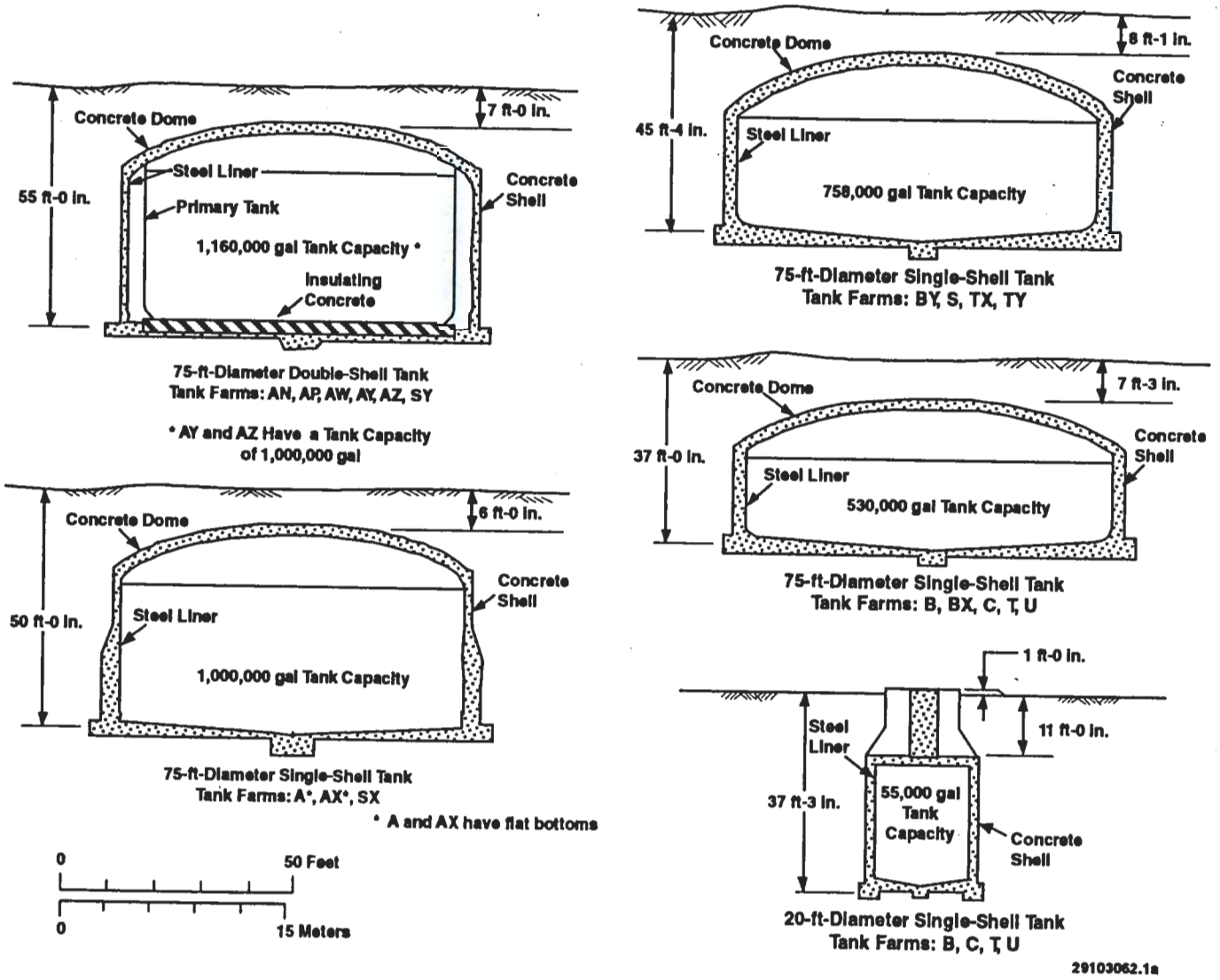


FIGURE D-1. HIGH-LEVEL WASTE TANK CONFIGURATION

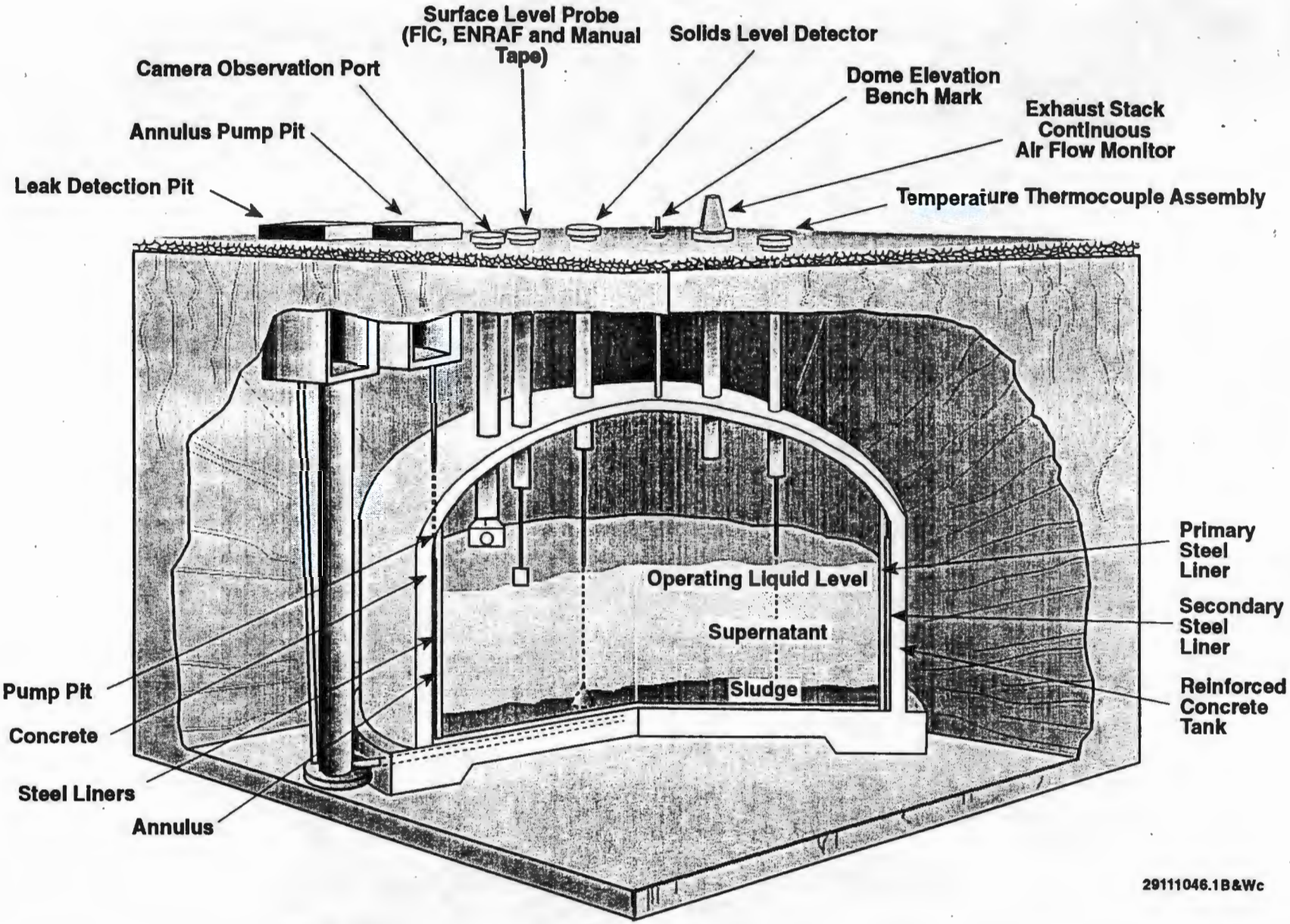


FIGURE D-2. DOUBLE-SHELL TANK INSTRUMENTATION CONFIGURATION

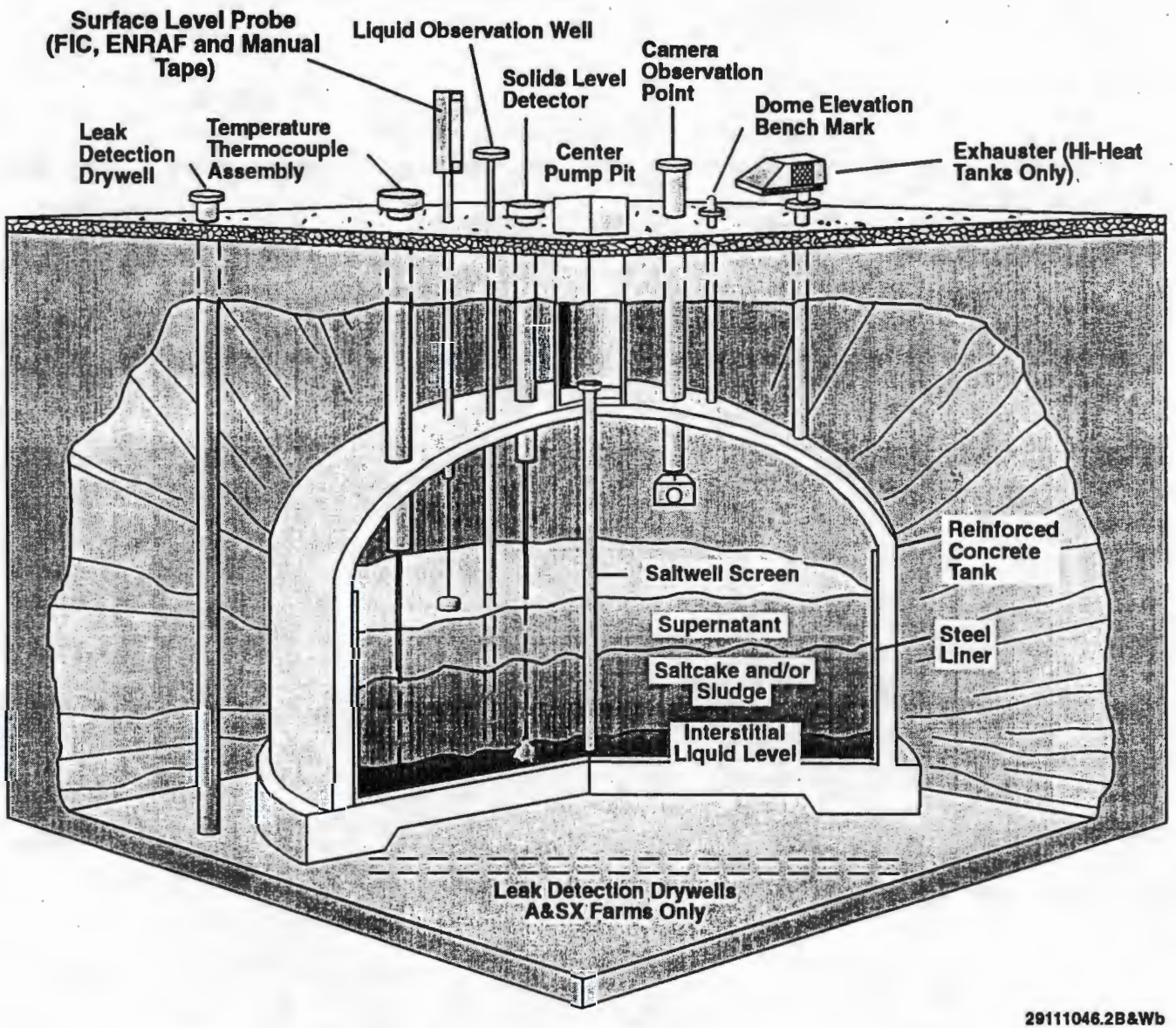


FIGURE D-3. SINGLE-SHELL TANK INSTRUMENTATION CONFIGURATION

Hanford Tank Farm Facilities
200 East

Note:
All single-shell tanks were removed from service (not allowed to receive waste) on or before November 21, 1980

Active Lines Only

- Concrete encased or pipe-in-pipe
- Direct Buried Pipe
- Cross-Site Transfer Lines (concrete encased or pipe-in-pipe)

Controlled, Clean and Stable | Single-Shell | Double-Shell | Intrusion Prevention Completed

Sound Tanks

All tanks 75 ft. dia. except 200 series tanks which are 20 ft. dia. @ 55,000 gal

DST = Double-Shell Tank
SST = Single-Shell Tank
DCRT = Double Contained Receiver Tank
CASS = Computer Automated Surveillance System
FIC/ENRAF = Liquid Level Monitoring Devices
TMACS = Tank Monitor and Control System

High Heat Load Tanks = East Area - A-104/105, C-106

Tank Number
Radiation Monitoring Dry Well – Approx Location
● = Active
○ = Inactive
Radiation Monitoring Laterals Under Tank (X = not used)
Total Solids (1,000 gal) Salt Cake/ Sludge/DSS (Inactive Tanks)
Drainable Liquid Remaining (1000 gal) (Inactive Tanks)
Exhauster (A-104/105/106 inoperative)
Liquid-Level Gauges
▼ = FIC read manually
Y = Tape read manually
▽ = Auto FIC on CASS
▽ = Intrusion Mode FIC
Watch List Tanks
Interim Stabilized (Yellow Tank)
■=ENRAF Read Manually
▨=Auto ENRAF on TMACS
Airlift Circulators (AN-107 and AW-102 are inoperative)
Temperature Reading:
● Automatic (TMACS)
○ Manual
Liquid Observation Well (LOW)
Screen – Jet Pump –
Assumed Leaker
Assumed Leaked Date

Watch List Tanks

- H2/Flammable gases
- Organics

106-C (cooling water added)

BY-Tank Farm
In Service 1950-51
12 @ 758,000 gal

B-Tank Farm
In Service 1945-47
12 @ 530,000 gal
4 @ 55,000 gal

BX-Tank Farm
In Service 1948-50
12 @ 530,000 gal

C-Tank Farm
In Service 1946-53
12 @ 530,000 gal
4 @ 55,000 gal

244-BX DCRT
ER-152
ER-151
ER-153
Cross-Site
CR Vault
244-A DCRT
WESF
B-Plant
AX-155
Valve Pits
AR-151
204 AR
AR Vault

AN-Tank Farm
In Service 1981
7 @ 1,160,000 gal

AZ-Tank Farm
In Service 1975-76
(Aging Waste Tanks)
2 @ 1,000,000 gal

AY-Tank Farm
In Service 1971-76
(Aging Waste Tanks) 2 @ 1,000,000 gal

AX-Tank Farm
In Service 1965-66
4 @ 1,000,000 gal

A-Tank Farm
In Service 1956-57
6 @ 1,000,000 gal

AX-152
Valve Pits
Valve Pits
242-A Evaporator
AP Valve Pit
Grout Equip
Valve Pits
PUREX
A-151
Vault Field

AW-Tank Farm
In Service 1980
6 @ 1,160,000 gal

AP-Tank Farm
In Service 1986
8 @ 1,160,000 gal

Figure D-4
(Schematic)

29502008.2C
01/99

Status as of December 31, 1998
Updated Quarterly
Issued by Tank Waste Remediation System

Hanford Tank Farm Facilities 200 West

Note:
All single-shell tanks were removed from service (not allowed to receive waste) on or before November 21, 1980

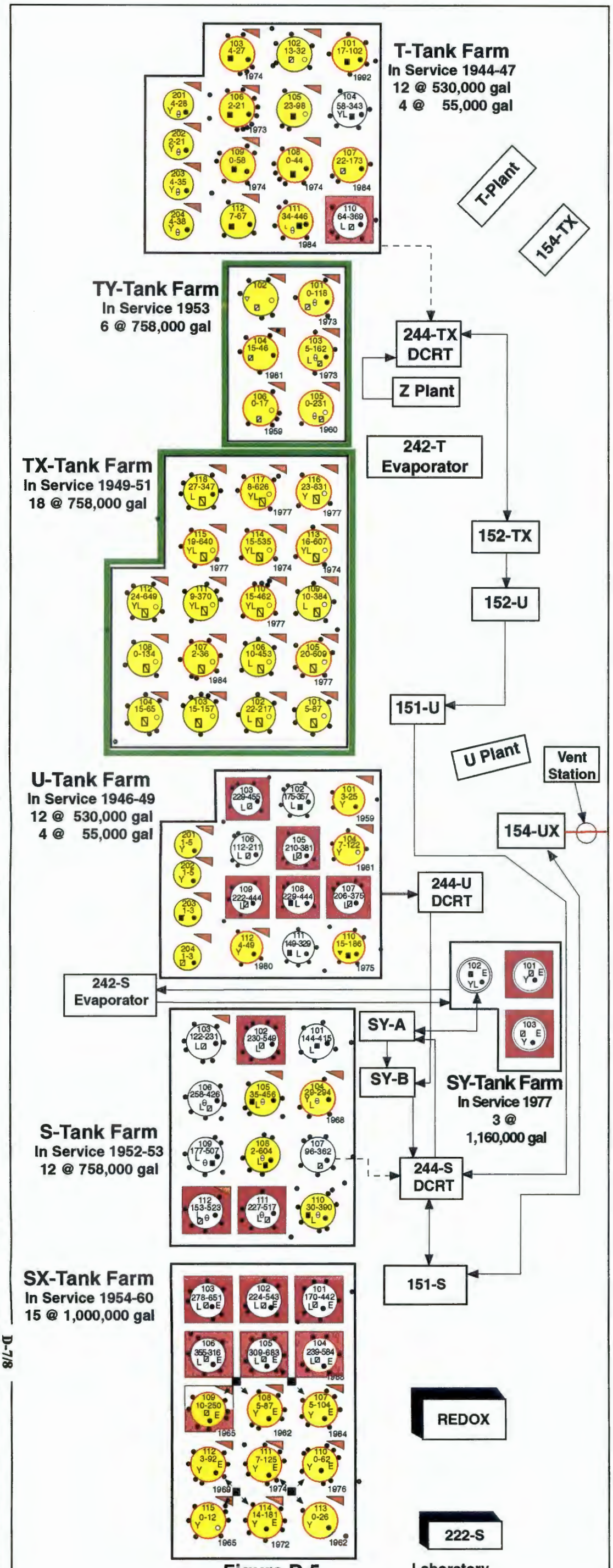


Figure D-5
(Schematic)

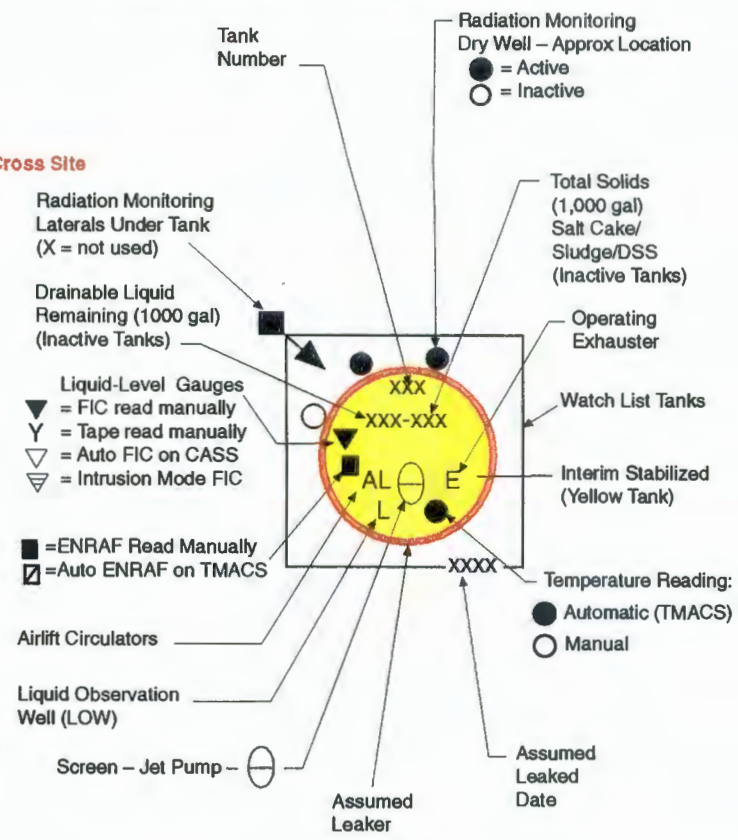
Active Lines Only

- Concrete encased or pipe-in-pipe
- Direct Buried Pipe
- Cross-Site Transfer Lines (concrete encased or pipe-in-pipe)

All tanks 75 ft. dia. except 200 series tanks which are 20 ft. dia. @ 55,000 gal

DST = Double-Shell Tank
SST = Single-Shell Tank
DCRT = Double Contained Receiver Tank
CASS = Computer Automated Surveillance System
FIC/ENRAF = Liquid Level Monitoring Devices
TMACS = Tank Monitor and Control System

High Heat Load Tanks = West Area - SX-107/108/109/110/111/112/114



Watch List Tanks

- H2/Flammable gases (109-SX has potential only-other tanks vent through it)

Status as of December 31,1998
Updated Quarterly
Issued by Tank Waste Remediation System

29502008.1C
01/99

APPENDIX E

MONTHLY SUMMARY
TANK USE SUMMARY
PUMPING RECORD, LIQUID STATUS AND PUMPABLE LIQUID REMAINING IN TANK FARMS
INVENTORY SUMMARY BY TANK FARM
INVENTORY AND STATUS BY TANK

TABLE E-1. MONTHLY SUMMARY
TANK STATUS
December 31, 1998

	200 EAST AREA	200 WEST AREA	TOTAL
IN SERVICE	25	03	28 (1)
OUT OF SERVICE	66	83	149
SOUND	59	51	110
ASSUMED LEAKER	32	35	67
INTERIM STABILIZED	60	59	119 (2)
ISOLATED			
PARTIAL INTERIM	11	30	41
INTRUSION PREVENTION COMPLETE	55	53	108
CONTROLLED, CLEAN, AND STABLE	12	24	36

WASTE VOLUMES (Kgallons)

		200 EAST AREA	200 WEST AREA	TOTAL	SST TANKS	DST TANKS	TOTAL
SUPERNATANT							
AGING	Aging waste	1596	0	1596	0	1596	1596
CC	Complexant concentrate waste	2152	1503	3655	3	3652	3655
CP	Concentrated phosphate waste	1093	0	1093	0	1093	1093
DC	Dilute complexed waste	865	0	865	1	864	865
DN	Dilute non-complexed waste	1912	0	1912	0	1912	1912
DN/PD	Dilute non-complex/PUREX TRU solid	315	0	315	0	315	315
DN/PT	Dilute non-complex/PFP TRU solids	0	886	886	0	886	886
NCPLX	Non-complexed waste	157	498	655	655	0	655
DSSF	Double-shell slurry feed	5302	48	5350	951	4399	5350
TOTAL SUPERNATANT		13392	2935	16327	1610	14717	16327
SOLIDS							
Double-shell slurry		410	0	410	0	410	410
Sludge		9334	6273	15607	12063	3544	15607
Saltcake		5188	16390	21578	21499	79	21578
TOTAL SOLIDS		14932	22663	37595	33562	4033	37595
TOTAL WASTE		28324	25598	53922	35172	18750	53922
AVAILABLE SPACE IN TANKS		11994	566	12560	0	12560	12560
DRAINABLE INTERSTITIAL		1745	4532	6277	5995	282	6277
DRAINABLE LIQUID REMAINING		15204	7663	22867	7868	14999	22867

(1) Includes six double-shell tanks on Hydrogen Watch List not currently allowed to receive waste, AN-103, AN-104, AN-105, AW-101, SY-101, and SY-103.
(2) Includes one tank (B-202) which does not meet current established supernatant and interstitial liquid stabilization criteria.

TABLE E-2. TANK USE SUMMARY

December 31, 1998

TANK FARMS	TANKS RECEIVING WASTE TRANSERS	SOUND	ASSUMED LEAKER	ISOLATED TANKS: PARTIAL INTERIM	ISOLATED TANKS: INTRUSION PREVENTION COMPLETED	ISOLATED TANKS: CONTROLLED CLEAN, AND STABLE	ISOLATED TANKS: INTERIM TABILIZED TANKS
EAST							
A	0	3	3	2	4	0	5
AN	7 (1)	7	0	0	0		0
AP	8	8	0	0	0		0
AW	6 (1)	6	0	0	0		0
AX	0	2	2	1	3		3
AY	2	2	0	0	0		0
AZ	2	2	0	0	0		0
B	0	6	10	0	16		16 (2)
BX	0	7	5	0	12	12	12
BY	0	7	5	5	7		10
C	0	9	7	3	13		14
Total	25	59	32	11	55	12	60
WEST							
S	0	11	1	10	2		4
SX	0	5	10	6	9		9
SY	3 (1)	3	0	0	0		0
T	0	9	7	5	11		14
TX	0	10	8	0	18	18	18
TY	0	1	5	0	6	6	6
U	0	12	4	9	7		8
Total	3	51	35	30	53	24	59
TOTAL	28	110	67	41	108	36	119

(1) Six Double-Shell Tanks on the Hydrogen Tank Watch List are not currently receiving waste transfers (AN-103, 104, 105, AW-101, SY-101 and 103).

(2) Includes tank B-202 which no longer meets established supernatant interstitial liquid stabilization criteria.

TABLE E-3. PUMPING RECORD, LIQUID STATUS AND PUMPABLE LIQUID REMAINING IN TANK FARMS

December 31, 1998

	Waste Volumes (Kgallons)						
TANK FARMS	*PUMPED THIS MONTH*	*PUMPED FY TO DATE*	*CUMULATIVE TOTAL PUMPED 1979 TO DATE*	*SUPERNATANT LIQUID*	*DRAINABLE INTERSTITIAL REMAINING*	*DRAINABLE LIQUID REMAINING*	*PUMPABLE LIQUID REMAINING*
EAST							
A	0.0	0.0	150.5	517	217	758	697
AN	N/A	N/A	N/A	3710	127	3837	N/A
AP	N/A	N/A	N/A	3597	3	3600	N/A
AW	N/A	N/A	N/A	2925	142	3067	N/A
AX	0.0	0.0	13.0	389	198	611	540
AY	N/A	N/A	N/A	500	5	505	N/A
AZ	N/A	N/A	N/A	1596	5	1601	N/A
B	0.0	0.0	0.0	15	164	179	80
BX	N/A	0.0	200.2	21	107	129	N/A
BY	0.0	0.0	1567.8	0	584	596	431
C	0.0	0.0	103.0	122	193	321	227
Total	0.0	0.0	2034.5	13392	1745	15204	1975
WEST							
S	0.0	0.0	853.6	120	1313	1505	1392
SX	6.9	38.9	177.1	222	1390	1657	1555
SY	N/A	N/A	N/A	2389	0	2389	N/A
T	4.0	20.1	229.7	28	218	258	188
TX	N/A	0.0	1205.7	5	250	255	N/A
TY	N/A	0.0	29.9	3	31	34	N/A
U	0.0	0.0	0.0	168	1330	1565	1474
Total	10.9	59.0	2496.0	2935	4532	7663	4609
TOTAL	10.9	59.0	4530.5	16327	6277 (1)	22867	6584 (1)

(1) Volume based on 21% (sludge waste) and 50% (saltcake waste) liquid in solid (porosity) value, per WHC-SD-W236A-ES-012, Rev .1, dated May 21, 1996, a re-evaluation of the non-stabilized tanks.

N/A = Not applicable for Double-Shell Tank Farms, and Single-Shell Tank Farms which have been declared Controlled, Clean and Stable (BX, TX, TY).

TABLE E-4. INVENTORY SUMMARY BY TANK FARM

December 31, 1998

TANK FARM	TOTAL WASTE	AVAIL SPACE	SUPERNATANT LIQUID VOLUMES (Kgallons) AGING	CC	CP	DC	DN	DN/PD	DN/PT	DSSF	NCPLX	TOTAL	SOLIDS VOLUME DSS	SLUDGE	SALT CAKE	TOTAL
EAST																
A	1537	0	0	0	0	0	0	0	0	517	0	517	0	556	464	1020
AN	5449	2531	0	1797	0	0	125	0	0	1788	0	3710	410	1324	0	1734
AP	3689	5431	0	0	1093	254	458	0	0	1792	0	3597	0	90	0	90
AW	4359	2481	0	352	0	551	888	315	0	819	0	2925	0	1358	75	1433
AX	906	0	0	3	0	0	0	0	0	386	0	389	0	19	498	517
AY	635	1325	0	0	0	59	441	0	0	0	0	500	0	130	0	130
AZ	1749	211	1596	0	0	0	0	0	0	0	0	1596	0	151	0	151
B	2057	0	0	0	0	0	0	0	0	0	15	15	0	1697	345	2042
BX	1493	0	0	0	0	0	0	0	0	0	21	21	0	1351	121	1472
BY	4561	0	0	0	0	0	0	0	0	0	0	0	0	797	3685	4482
C	1976	0	0	0	0	1	0	0	0	0	121	122	0	1861	0	1861
Total	28411	11979	1596	2152	1093	865	1912	315	0	5302	157	13392	410	9334	5188	14932
WEST																
S	5300	0	0	0	0	0	0	0	0	103	17	120	0	1206	3913	5119
SX	4407	0	0	0	0	0	0	0	0	0	222	222	0	1310	2842	4152
SY	2863	582	0	1503	0	0	0	0	886	0	0	2389	0	491	4	495
T	1879	0	0	0	0	0	0	0	0	0	28	28	0	1875	0	1875
TX	7009	0	0	0	0	0	0	0	0	0	5	5	0	241	6763	7004
TY	638	0	0	0	0	0	0	0	0	0	3	3	0	571	64	635
U	3550	0	0	0	0	0	0	0	0	31	137	168	0	579	2804	3383
Total	25646	582	0	1503	0	0	0	0	886	134	412	2935	0	6273	16390	22663
TOTAL	54057	12561	1596	3655	1093	865	1912	315	886	5436	569	16327	410	15607	21578	37595

TABLE E-5. INVENTORY AND STATUS BY TANK - DOUBLE SHELL TANKS

December 31, 1998

TANK STATUS							LIQUID VOLUME				SOLIDS VOLUME			VOLUME DETERMINATION			PHOTOS/VIDEOS		
TANK	WAST MATL	TANK INTEGRITY	TANK USE	EQUIVA-LENT WASTE INCHES	TOTAL WASTE (Kgal)	AVAIL. SPACE (Kgal)	SUPER-NATANT LIQUID (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	DSS (Kgal)	SLUDGE	SALT CAKE	LIQUID VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST IN-TANK PHOTO	LAST IN-TANK VIDEO	SEE FOOTNOTE FOR THESE CHANGES
AN TANK FARM STATUS																			
AN-101	DN	SOUND	DRCVR	57.5	158	982	125	0	125	125	0	33	0	FM	S	04/30/96	0/ 0/ 0		
AN-102	CC	SOUND	CWHT	386.9	1064	76	975	3	978	975	0	89	0	FM	S	08/22/89	0/ 0/ 0		
AN-103	DSS	SOUND	CWHT	348.0	957	183	547	0	547	547	410	0	0	FM	S	03/31/97	10/29/87		
AN-104	DSSF	SOUND	CWHT	382.9	1053	87	604	48	652	630	0	449	0	FM	S	03/31/97	08/19/88		
AN-105	DSSF	SOUND	CWHT	409.5	1126	14	637	53	690	668	0	489	0	FM	S	03/31/97	01/26/88		
AN-106	CC	SOUND	CWHT	14.2	39	1101	22	0	22	22	0	17	0	FM	S	08/22/89	0/ 0/ 0		
AN-107	CC	SOUND	CWHT	380.7	1047	93	800	23	823	801	0	247	0	FM	S	08/22/89	09/01/88		
7 DOUBLE-SHELL TANKS				TOTALS	5444	2536	3710	127	3837	3768	410	1324	0						
AP TANK FARM STATUS																			
AP-101	DSSF	SOUND	DRCVR	405.5	1115	25	1115	0	1115	1115	0	0	0	FM	S	05/01/89	0/ 0/ 0		
AP-102	CP	SOUND	GRTFD	397.5	1093	47	1093	0	1093	1093	0	0	0	FM	S	07/11/89	0/ 0/ 0		
AP-103	DN	SOUND	DRCVR	8.7	24	1116	23	0	23	23	0	1	0	FM	S	05/31/96	0/ 0/ 0		
AP-104	DN	SOUND	GRTFD	8.7	24	1116	24	0	24	24	0	0	0	FM	S	10/13/88	0/ 0/ 0		
AP-105	DSSF	SOUND	CWHT	278.5	766	374	677	3	680	677	0	89	0	FM	S	03/31/98	0/ 0/ 0	09/27/95	(a)
AP-106	DN	SOUND	DRCVR	141.5	389	751	389	0	389	389	0	0	0	FM	S	10/13/88	0/ 0/ 0		
AP-107	DN	SOUND	DRCVR	8.0	22	1118	22	0	22	22	0	0	0	FM	S	10/13/88	0/ 0/ 0		
AP-108	DC	SOUND	DRCVR	92.4	254	886	254	0	254	254	0	0	0	FM	S	10/13/88	0/ 0/ 0		
8 DOUBLE-SHELL TANKS				TOTALS	3687	5433	3597	3	3600	3597	0	90	0						
AW TANK FARM STATUS																			
AW-101	DSSF	SOUND	CWHT	409.1	1125	15	819	30	849	827	0	306	0	FM	S	03/31/97	03/17/88		
AW-102	DC	SOUND	EVFD	214.9	591	549	551	0	551	551	0	40	0	FM	S	08/31/97	02/02/83		
AW-103	DN/PD	SOUND	DRCVR	186.8	511	629	163	35	198	176	0	348	0	FM	S	03/31/98	0/ 0/ 0		(a)
AW-104	DN	SOUND	DRCVR	406.9	1119	21	888	30	918	896	0	156	75	FM	S	03/31/98	02/02/83		(a)
AW-105	DN/PD	SOUND	DRCVR	157.1	432	708	152	27	179	157	0	280	0	FM	S	03/31/98	0/ 0/ 0		(a)
AW-106	CC	SOUND	SRCVR	210.9	580	560	352	20	372	352	0	228	0	FM	S	08/31/97	02/02/83		
6 DOUBLE-SHELL TANKS				TOTALS	4358	2482	2925	142	3067	2959	0	1358	75						

TABLE E-5. INVENTORY AND STATUS BY TANK - DOUBLE SHELL TANKS

December 31, 1998

TANK STATUS							LIQUID VOLUME				SOLIDS VOLUME			VOLUME DETERMINATION			PHOTOS/VIDEOS		
TANK	WAST MATL	TANK INTEGRITY	TANK USE	EQUIVA-LENT WASTE INCHES	TOTAL WASTE (Kgal)	AVAIL. SPACE (Kgal)	SUPER-NATANT LIQUID (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	DSS (Kgal)	SLUDGE	SALT CAKE	LIQUID VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST IN-TANK PHOTO	LAST IN-TANK VIDEO	SEE FOOTNOTE FOR THESE CHANGES
AY TANK FARM STATUS																			
AY-101	DC	SOUND	DRCVR	60.7	167	813	59	5	64	59	0	108	0	FM	S	10/31/97	12/28/82		
AY-102	DN	SOUND	DRCVR	168.4	463	517	441	0	441	441	0	22	0	FM	S	10/31/97	04/28/81		
2 DOUBLE-SHELL TANKS				TOTALS	630	1330	500	5	505	500	0	130	0						
AZ TANK FARM STATUS																			
AZ-101	AGING	SOUND	CWHT	308.7	849	131	802	0	802	802	0	47	0	FM	S	10/31/97	08/18/83		
AZ-102	AGING	SOUND	DRCVR	328.5	898	82	794	5	799	794	0	104	0	FM	S	10/31/97	10/24/64		
2 DOUBLE-SHELL TANKS				TOTALS	1747	213	1596	5	1601	1596	0	151	0						
SY TANK FARM STATUS																			
SY-101	CC	SOUND	CWHT	425.5	1170	0	1129	0	1129	1129	0	41	0	FM	S	05/31/96	04/12/89		(b)
SY-102	DN/PT	SOUND	DRCVR	354.2	974	166	886	0	886	886	0	88	0	FM	S	03/31/98	04/29/81		(a)
SY-103	CC	SOUND	CWHT	269.1	740	400	374	0	374	374	0	362	4	FM	S	06/30/96	10/01/85		
3 DOUBLE-SHELL TANKS				TOTALS	2884	566	2389	0	2389	2389	0	491	4						
GRAND TOTAL					18750	12560	14717	282	14999	14809	410	3544	79						

Note: +/- 1 Kgal differences are the result of computer rounding

Tank Farms	Available Space Calculations Used in This Document (Most Conservative)	IOSR WHC-SD-WM-OSR-16 (AN, AP, AW, SY) WHC-T-151-00009 (Aging Waste)	
AN, AP, AW, SY	1,140,000 gal (414.5 in.)	1,144,000 gal (416 in.)(AN, AP, SY)	1,127,500 (410 in.)(AW-Farm)
AY, AZ (Aging Waste)	980,000 gal (356.4 in.)	1,000,000 gal (363.6 in.)(AY, AZ)	

NOTE: Tanks AN-102, AN-107, AY-101, AY-102, AP-103, AP-104, AP-107 - These tanks currently contain waste that is outside of the current corrosion control specification. An alternate strategy of corrosion control (monitor using corrosion probes; adjust chemistry as required for control) is being proposed but has not been fully evaluated. Note that the supernate in AY-102 is within the corrosion specifications, however, the sludge layer is outside the specifications.

(a) Solids levels in tanks AP-105, AW-103, AW-104, AW-105, and SY-102 were adjusted based on document HNF-SD-WM-TI-806, "Gas Release Event Safety Analysis Tool Pedigree Database for Hanford Tanks," Rev 2, dated December 28, 1998.

(b) Tank SY-101 - Total Waste exceeds the "most conservative" Available Space calculations used for these tanks, but does not exceed the OSR requirements

TABLE E-6. INVENTORY AND STATUS BY TANK - SINGLE-SHELL TANKS

December 31, 1998

TANK STATUS					LIQUID VOLUME						SOLIDS VOLUME		VOLUME DETERMINATION			PHOTOS/VIDEOS		
TANK	WASTE MAT'L.	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATE LIQUID (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALT CAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST IN-TANK PHOTO	LAST IN-TANK VIDEO	SEE FOOTNOTES FOR THESE CHANGES
								A TANK FARM STATUS										
A-101	DSSF	SOUND	/PI	953	508	189	0.0	0.0	721	697	3	442	P	F	12/31/98	08/21/85		(e)
A-102	DSSF	SOUND	IS/PI	41	4	2	0.0	39.5	6	0	15	22	P	FP	07/27/89	07/20/89		
A-103	DSSF	ASMD LKR	IS/IP	371	5	15	0.0	111.0	20	0	366	0	-	FP	06/03/88	12/28/88		
A-104	NCPLX	ASMD LKR	IS/IP	28	0	0	0.0	0.0	0	0	28	0	M	PS	01/27/78	06/25/86		
A-105	NCPLX	ASMD LKR	IS/IP	19	0	4	0.0	0.0	4	0	19	0	P	MP	08/23/79	08/20/86		
A-106	CP	SOUND	IS/IP	125	0	7	0.0	0.0	7	0	125	0	P	M	09/07/82	08/19/86		
6 SINGLE-SHELL TANKS			TOTALS	1537	517	217	0.0	150.5	758	697	556	464						
								AX TANK FARM STATUS										
AX-101	DSSF	SOUND	/PI	746	386	148	0.0	0.0	558	534	3	359	P	F	12/31/98	08/18/87		(e)
AX-102	CC	ASMD LKR	IS/IP	39	3	14	0.0	13.0	17	3	7	29	F	S	09/06/88	06/05/89		
AX-103	CC	SOUND	IS/IP	112	0	36	0.0	0.0	36	3	2	110	F	S	08/19/87	08/13/87		
AX-104	NCPLX	ASMD LKR	IS/IP	7	0	0	0.0	0.0	0	0	7	0	P	M	04/28/82	08/18/87		
4 SINGLE-SHELL TANKS			TOTALS:	906	389	198	0.0	13.0	611	540	19	498						
								B TANK FARM STATUS										
B-101	NCPLX	ASMD LKR	IS/IP	113	0	6	0.0	0.0	6	0	113	0	P	F	04/28/82	05/19/83		
B-102	NCPLX	SOUND	IS/IP	32	4	0	0.0	0.0	4	0	18	10	P	F	08/22/85	08/22/85		
B-103	NCPLX	ASMD LKR	IS/IP	59	0	0	0.0	0.0	0	0	59	0	F	F	02/28/85	10/13/88		
B-104	NCPLX	SOUND	IS/IP	371	1	46	0.0	0.0	47	40	301	69	M	M	06/30/85	10/13/88		
B-105	NCPLX	ASMD LKR	IS/IP	306	0	23	0.0	0.0	23	0	40	266	P	MP	12/27/84	05/19/88		
B-106	NCPLX	SOUND	IS/IP	117	1	6	0.0	0.0	7	0	116	0	F	F	03/31/85	02/28/85		
B-107	NCPLX	ASMD LKR	IS/IP	165	1	12	0.0	0.0	13	7	164	0	M	M	03/31/85	02/28/85		
B-108	NCPLX	SOUND	IS/IP	94	0	4	0.0	0.0	4	0	94	0	F	F	05/31/85	05/10/85		
B-109	NCPLX	SOUND	IS/IP	127	0	8	0.0	0.0	8	0	127	0	M	M	04/08/85	04/02/85		
B-110	NCPLX	ASMD LKR	IS/IP	246	1	22	0.0	0.0	23	17	245	0	MP	MP	02/28/85	03/17/88		
B-111	NCPLX	ASMD LKR	IS/IP	237	1	21	0.0	0.0	22	16	236	0	F	F	06/28/85	06/26/85		
B-112	NCPLX	ASMD LKR	IS/IP	33	3	0	0.0	0.0	3	0	30	0	F	F	05/31/85	05/29/85		
B-201	NCPLX	ASMD LKR	IS/IP	29	1	3	0.0	0.0	4	0	28	0	M	M	04/28/82	11/12/86	06/23/95	
B-202	NCPLX	SOUND	IS/IP	27	0	3	0.0	0.0	3	0	27	0	P	M	05/31/85	05/29/85	06/15/95	
B-203	NCPLX	ASMD LKR	IS/IP	51	1	5	0.0	0.0	6	0	50	0	PM	PM	05/31/84	11/13/86		
B-204	NCPLX	ASMD LKR	IS/IP	50	1	5	0.0	0.0	6	0	49	0	P	M	05/31/84	10/22/87		
16 SINGLE-SHELL TANKS			TOTALS	2057	15	164	0.0	0.0	179	80	1697	345						

TABLE E-6. INVENTORY AND STATUS BY TANK - SINGLE-SHELL TANKS

December 31, 1998

TANK STATUS					LIQUID VOLUME						SOLIDS VOLUME		VOLUME DETERMINATION			PHOTOS/VIDEOS		
TANK	WASTE MAT'L.	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATE (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALT CAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST IN-TANK PHOTO	LAST IN-TANK VIDEO	SEE FOOTNOTES FOR THESE CHANGES
								BX TANK FARM STATUS										
BX-101	NCPLX	ASMD LKR	IS/IP/CCS	43	1	0	0.0	0.0	1	0	42	0	P	M	04/28/82	11/24/88	11/10/94	
BX-102	NCPLX	ASMD LKR	IS/IP/CCS	96	0	4	0.0	0.0	4	0	96	0	P	M	04/28/82	09/18/85		
BX-103	NCPLX	SOUND	IS/IP/CCS	68	6	0	0.0	0.0	6	0	62	0	P	F	11/29/83	10/31/86	10/27/94	
BX-104	NCPLX	SOUND	IS/IP/CCS	99	3	30	0.0	17.4	33	27	96	0	F	F	09/22/89	09/21/89		
BX-105	NCPLX	SOUND	IS/IP/CCS	51	5	6	0.0	15.0	11	4	43	3	F	S	09/03/86	10/23/86		
BX-106	NCPLX	SOUND	IS/IP/CCS	38	0	0	0.0	14.0	0	0	38	0	MP	PS	08/01/95	05/19/88	07/17/95	
BX-107	NCPLX	SOUND	IS/IP/CCS	345	1	29	0.0	23.1	30	23	344	0	MP	P	09/18/90	09/11/90		
BX-108	NCPLX	ASMD LKR	IS/IP/CCS	26	0	1	0.0	0.0	1	0	26	0	M	PS	07/31/79	05/05/94		
BX-109	NCPLX	SOUND	IS/IP/CCS	193	0	13	0.0	8.2	13	8	193	0	FP	P	09/17/90	09/11/90		
BX-110	NCPLX	ASMD LKR	IS/IP/CCS	207	3	16	0.0	1.5	19	13	195	9	MP	M	10/31/94	07/15/94	10/13/94	
BX-111	NCPLX	ASMD LKR	IS/IP/CCS	162	1	1	0.0	116.9	3	1	52	109	M	M	04/06/95	05/19/94	02/28/95	
BX-112	NCPLX	SOUND	IS/IP/CCS	165	1	7	0.0	4.1	8	2	164	0	FP	P	09/17/90	09/11/90		
12 SINGLE-SHELL TANKS			TOTALS:	1493	21	107	0.0	200.2	129	78	1351	121						
								BY TANK FARM STATUS										
BY-101	NCPLX	SOUND	IS/IP	387	0	5	0.0	35.8	5	0	109	278	P	M	05/30/84	09/19/89		
BY-102	NCPLX	SOUND	IS/PI	277	0	11	0.0	159.0	11	0	0	277	MP	M	05/01/95	09/11/87	04/11/95	
BY-103	NCPLX	ASMD LKR	IS/PI	414	0	38	0.0	95.9	38	32	5	409	MP	M	11/25/97	09/07/89	02/24/97	
BY-104	NCPLX	SOUND	IS/IP	406	0	18	0.0	329.5	18	0	40	366	P	M	04/28/82	04/27/83		
BY-105	NCPLX	ASMD LKR	/PI	504	0	186	0.0	0.0	192	186	159	345	P	MP	12/31/98	07/01/86		(e)
BY-106	NCPLX	ASMD LKR	/PI	562	0	238	0.0	63.7	244	238	84	478	P	MP	12/31/98	11/04/82		(e)
BY-107	NCPLX	ASMD LKR	IS/IP	266	0	25	0.0	56.4	25	0	60	206	P	MP	04/28/82	10/15/86		
BY-108	NCPLX	ASMD LKR	IS/IP	228	0	9	0.0	27.5	9	0	154	74	MP	M	04/28/82	10/15/86		
BY-109	NCPLX	SOUND	IS/PI	290	0	37	0.0	157.1	37	20	57	233	F	PS	07/08/87	06/18/97		
BY-110	NCPLX	SOUND	IS/IP	396	0	9	0.0	213.3	9	0	103	295	M	S	09/10/79	07/26/84		
BY-111	NCPLX	SOUND	IS/IP	459	0	0	0.0	313.2	0	0	21	438	P	M	04/28/82	10/31/86		
BY-112	NCPLX	SOUND	IS/IP	291	0	8	0.0	116.4	8	0	5	286	P	M	04/28/82	04/14/88		
12 SINGLE-SHELL TANKS			TOTALS:	4482	0	584	0.0	1567.8	596	476	797	3685						

TABLE E-6. INVENTORY AND STATUS BY TANK - SINGLE-SHELL TANKS

December 31, 1998

TANK STATUS					LIQUID VOLUME						SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE MAT'L.	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATE (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALT CAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST IN-TANK PHOTO	LAST IN-TANK VIDEO	SEE FOOTNOTES FOR THESE CHANGES
								C TANK FARM STATUS										
C-101	NCPLX	ASMD LKR	IS/IP	88	0	3	0.0	0.0	3	0	88	0	M	M	11/29/83	11/17/87		
C-102	DC	SOUND	IS/IP	316	0	30	0.0	46.7	30	17	316	0	F	FP	09/30/95	05/18/76	08/24/95	
C-103	NCPLX	SOUND	/PI	202	83	5	0.0	0.0	94	88	119	0	F	S	12/31/98	07/28/87		(e)
C-104	CC	SOUND	IS/IP	295	0	11	0.0	0.0	11	5	295	0	FP	P	09/22/89	07/25/90		
C-105	NCPLX	SOUND	IS/PI	134	2	30	0.0	0.0	32	9	132	0	F	S	10/31/95	08/05/94	08/30/95	
C-106	NCPLX	SOUND	/PI	229	32	30	0.0	0.0	62	52	197	0	F	PS	04/28/82	08/05/94	08/08/94	
C-107	DC	SOUND	IS/IP	237	0	24	0.0	40.8	24	15	237	0	F	S	09/30/95	00/00/00		
C-108	NCPLX	SOUND	IS/IP	66	0	0	0.0	0.0	0	0	66	0	M	S	02/24/84	12/05/74	11/17/94	
C-109	NCPLX	SOUND	IS/IP	66	4	0	0.0	0.0	4	0	62	0	M	PS	11/29/83	01/30/76		
C-110	DC	ASMD LKR	IS/IP	178	1	28	0.0	15.5	29	15	177	0	F	FMP	06/14/95	08/12/86	05/23/95	
C-111	NCPLX	ASMD LKR	IS/IP	57	0	0	0.0	0.0	0	0	57	0	M	S	04/28/82	02/25/70	02/02/95	
C-112	NCPLX	SOUND	IS/IP	104	0	32	0.0	0.0	32	26	104	0	M	PS	09/18/90	09/18/90		
C-201	NCPLX	ASMD LKR	IS/IP	2	0	0	0.0	0.0	0	0	2	0	P	MP	03/31/82	12/02/86		
C-202	EMPTY	ASMD LKR	IS/IP	1	0	0	0.0	0.0	0	0	1	0	P	M	01/19/79	12/09/86		
C-203	NCPLX	ASMD LKR	IS/IP	5	0	0	0.0	0.0	0	0	5	0	P	MP	04/28/82	12/09/86		
C-204	NCPLX	ASMD LKR	IS/IP	3	0	0	0.0	0.0	0	0	3	0	P	MP	04/28/82	12/09/86		
16 SINGLE-SHELL TANKS			TOTALS:	1983	122	193	0.0	103.0	321	227	1861	0						
								S TANK FARM STATUS										
S-101	NCPLX	SOUND	/PI	427	12	126	0.0	0.0	144	138	211	204	F	PS	12/31/98	03/18/88		(e)
S-102	DSSF	SOUND	/PI	549	0	224	0.0	0.0	230	224	105	444	P	FP	12/31/98	03/18/88		(e)
S-103	DSSF	SOUND	/PI	248	17	93	0.0	0.0	122	110	9	222	M	S	12/31/98	06/01/89		(e)
S-104	NCPLX	ASMD LKR	IS/IP	294	1	28	0.0	0.0	29	23	293	0	M	M	12/20/84	12/12/84		
S-105	NCPLX	SOUND	IS/IP	456	0	35	0.0	114.3	35	13	2	454	MP	S	09/26/88	04/12/89		
S-106	NCPLX	SOUND	/PI	479	53	190	0.0	97.0	258	243	0	426	P	FP	12/31/98	03/17/89	09/12/94	(e)
S-107	NCPLX	SOUND	/PI	378	14	76	0.0	0.0	96	90	293	69	F	PS	12/31/98	03/12/87		(e)
S-108	NCPLX	SOUND	IS/PI	450	0	4	0.0	199.8	4	0	4	446	P	MP	12/20/96	03/12/87	12/03/96	
S-109	NCPLX	SOUND	/PI	507	0	167	0.0	111.0	177	167	13	494	F	PS	09/30/75	12/31/98		(e)
S-110	NCPLX	SOUND	IS/PI	390	0	30	0.0	203.1	30	23	131	259	F	PS	05/14/92	03/12/87	12/11/96	
S-111	NCPLX	SOUND	/PI	540	23	198	0.0	3.3	227	221	139	378	P	FP	12/31/98	08/10/89		(e)
S-112	NCPLX	SOUND	/PI	523	0	142	0.0	125.1	153	140	6	517	P	FP	12/31/98	03/24/87		(e)
12 SINGLE-SHELL TANKS			TOTALS:	5239	120	1313	0.0	853.6	1505	1392	1206	3913						

TABLE E-6. INVENTORY AND STATUS BY TANK - SINGLE-SHELL TANKS

December 31, 1998

TANK STATUS					LIQUID VOLUME						SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE MAT'L.	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATE (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALT CAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST IN-TANK PHOTO	LAST IN-TANK VIDEO	SEE FOOTNOTES FOR THESE CHANGES
								SX TANK FARM STATUS										
SX-101	DC	SOUND	/PI	442	0	163	0.0	0.0	170	163	128	314	P	FP	12/31/98	03/10/89		(e)
SX-102	DSSF	SOUND	/PI	543	0	216	0.0	0.0	224	216	117	426	P	M	12/31/98	01/07/88		(e)
SX-103	NCPLX	SOUND	/PI	651	0	271	0.0	0.0	278	271	115	536	F	S	12/31/98	12/17/87		(e)
SX-104	DSSF	ASMD LKR	/PI	584	0	231	3.7	162.2	239	231	136	448	F	S	12/31/98	09/08/88	02/04/98	(a)(e)
SX-105	DSSF	SOUND	/PI	683	0	301	0.0	0.0	309	301	73	610	P	F	12/31/98	06/15/88		(d)(e)
SX-106	NCPLX	SOUND	/PI	538	222	126	3.2	14.9	355	348	52	264	F	PS	12/31/98	06/01/89		(b)(e)
SX-107	NCPLX	ASMD LKR	IS/IP	104	0	5	0.0	0.0	5	0	104	0	P	M	04/28/82	03/06/87		
SX-108	NCPLX	ASMD LKR	IS/IP	87	0	5	0.0	0.0	5	0	87	0	P	M	12/31/93	03/06/87		
SX-109	NCPLX	ASMD LKR	IS/IP	244	0	48	0.0	0.0	48	25	0	244	P	M	01/10/96	05/21/86		
SX-110	NCPLX	ASMD LKR	IS/IP	62	0	0	0.0	0.0	0	0	62	0	M	PS	10/06/76	02/20/87		
SX-111	NCPLX	ASMD LKR	IS/IP	125	0	7	0.0	0.0	7	0	125	0	M	PS	05/31/74	06/09/94		
SX-112	NCPLX	ASMD LKR	IS/IP	92	0	3	0.0	0.0	3	0	92	0	P	M	04/28/82	03/10/87		
SX-113	NCPLX	ASMD LKR	IS/IP	26	0	0	0.0	0.0	0	0	26	0	P	M	04/28/82	03/18/88		
SX-114	NCPLX	ASMD LKR	IS/IP	181	0	14	0.0	0.0	14	0	181	0	P	M	04/28/82	02/26/87		
SX-115	NCPLX	ASMD LKR	IS/IP	12	0	0	0.0	0.0	0	0	12	0	P	M	04/28/82	03/31/88		
15 SINGLE-SHELL TANKS			TOTALS:	4374	222	1390	6.9	177.1	1657	1555	1310	2842						
								T TANK FARM STATUS										
T-101	NCPLX	ASMD LKR	IS/PI	102	1	16	0.0	25.3	17	0	101	0	F	S	04/14/93	04/07/93		
T-102	NCPLX	SOUND	IS/IP	32	13	0	0.0	0.0	13	13	19	0	P	FP	08/31/84	06/28/89		
T-103	NCPLX	ASMD LKR	IS/IP	27	4	0	0.0	0.0	4	0	23	0	F	FP	11/29/83	07/03/84		
T-104	NCPLX	SOUND	/PI	343	0	52	2.1	144.8	58	52	343	0	P	MP	12/31/98	06/29/89		(c)(e)
T-105	NCPLX	SOUND	IS/IP	98	0	23	0.0	0.0	23	17	98	0	P	F	05/29/87	05/14/87		
T-106	NCPLX	ASMD LKR	IS/IP	21	2	0	0.0	0.0	2	0	19	0	P	FP	04/28/82	06/29/89		
T-107	NCPLX	ASMD LKR	IS/PI	173	0	22	0.0	11.0	22	12	173	0	P	FP	05/31/95	07/12/84	05/09/96	
T-108	NCPLX	ASMD LKR	IS/IP	44	0	0	0.0	0.0	0	0	44	0	P	M	04/28/82	07/17/84		

TABLE E-6. INVENTORY AND STATUS BY TANK - SINGLE-SHELL TANKS

December 31, 1998

TANK STATUS					LIQUID VOLUME						SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE MAT'L.	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATE (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALT CAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST IN-TANK PHOTO	LAST IN-TANK VIDEO	SEE FOOTNOTES FOR THESE CHANGES
T-109	NCPLX	ASMD LKR	IS/IP	58	0	0	0.0	0.0	0	0	58	0	M	M	12/30/84	02/25/93		
T-110	NCPLX	SOUND	/PI	369	0	58	1.9	39.0	64	58	369	0	P	FP	12/31/98	07/12/84		(d)(e)
T-111	NCPLX	ASMD LKR	IS/PI	446	0	34	0.0	9.6	34	29	446	0	P	FP	04/18/94	04/13/94	02/13/95	
T-112	NCPLX	SOUND	IS/IP	67	7	0	0.0	0.0	7	7	60	0	P	FP	04/28/82	08/01/84		
T-201	NCPLX	SOUND	IS/IP	29	1	3	0.0	0.0	4	0	28	0	M	PS	05/31/78	04/15/86		
T-202	NCPLX	SOUND	IS/IP	21	0	2	0.0	0.0	2	0	21	0	FP	P	07/12/81	07/06/89		
T-203	NCPLX	SOUND	IS/IP	35	0	4	0.0	0.0	4	0	35	0	M	PS	01/31/78	08/03/89		
T-204	NCPLX	SOUND	IS/IP	38	0	4	0.0	0.0	4	0	38	0	FP	P	07/22/81	08/03/89		
16 SINGLE-SHELL TANKS			TOTALS:	1903	28	218	4.0	229.7	258	188	1875	0						
								TX TANK FARM STATUS										
TX-101	NCPLX	SOUND	IS/IP/CCS	87	3	2	0.0	0.0	5	0	84	0	F	P	02/02/84	10/24/85		
TX-102	NCPLX	SOUND	IS/IP/CCS	217	0	22	0.0	94.4	22	0	0	217	M	S	08/31/84	10/31/85		
TX-103	NCPLX	SOUND	IS/IP/CCS	157	0	15	0.0	68.3	15	0	157	0	F	S	08/14/80	10/31/85		
TX-104	NCPLX	SOUND	IS/IP/CCS	65	1	14	0.0	3.6	15	0	0	64	F	FP	04/06/84	10/16/84		
TX-105	NCPLX	ASMD LKR	IS/IP/CCS	609	0	20	0.0	121.5	20	0	0	609	M	PS	08/22/77	10/24/89		
TX-106	NCPLX	SOUND	IS/IP/CCS	453	0	10	0.0	134.6	10	0	0	453	M	S	08/29/77	10/31/85		
TX-107	NCPLX	ASMD LKR	IS/IP/CCS	36	1	1	0.0	0.0	2	0	0	35	FP	FP	01/20/84	10/31/85		
TX-108	NCPLX	SOUND	IS/IP/CCS	134	0	0	0.0	13.7	0	0	0	134	P	FP	05/30/83	09/12/89		
TX-109	NCPLX	SOUND	IS/IP/CCS	384	0	10	0.0	72.3	10	0	0	384	F	PS	05/30/83	10/24/89		
TX-110	NCPLX	ASMD LKR	IS/IP/CCS	462	0	15	0.0	115.1	15	0	0	462	M	PS	05/30/83	10/24/89		
TX-111	NCPLX	SOUND	IS/IP/CCS	370	0	9	0.0	98.4	9	0	0	370	M	PS	07/26/77	09/12/89		
TX-112	NCPLX	SOUND	IS/IP/CCS	649	0	24	0.0	94.0	24	0	0	649	P	PS	05/30/83	11/19/87		
TX-113	NCPLX	ASMD LKR	IS/IP/CCS	607	0	16	0.0	19.2	16	0	0	607	M	PS	05/30/83	04/11/83	09/23/94	
TX-114	NCPLX	ASMD LKR	IS/IP/CCS	535	0	15	0.0	104.3	15	0	0	535	M	PS	05/30/83	04/11/83	02/17/95	
TX-115	NCPLX	ASMD LKR	IS/IP/CCS	640	0	19	0.0	99.1	19	0	0	640	M	S	03/25/83	06/15/88		
TX-116	NCPLX	ASMD LKR	IS/IP/CCS	631	0	23	0.0	23.8	23	0	0	631	M	PS	03/31/72	10/17/89		
TX-117	NCPLX	ASMD LKR	IS/IP/CCS	626	0	8	0.0	54.3	8	0	0	626	M	PS	12/31/71	04/11/83		
TX-118	NCPLX	SOUND	IS/IP/CCS	347	0	27	0.0	89.1	27	0	0	347	F	S	11/17/80	12/19/79		
18 SINGLE-SHELL TANKS			TOTALS:	7009	5	250	0.0	1205.7	255	0	241	6763						

TABLE E-6. INVENTORY AND STATUS BY TANK - SINGLE-SHELL TANKS

December 31, 1998

TANK STATUS					LIQUID VOLUME						SOLIDS VOLUM		VOLUME DETERMINATION			PHOTOS/VIDEOS		
TANK	WASTE MAT'L.	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATE LIQUID (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALT CAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST IN-TANK PHOTO	LAST IN-TANK VIDEO	SEE FOOTNOTES FOR THESE CHANGES
								TY TANK FARM STATUS										
TY-101	NCPLX	ASMD LKR	IS/IP/CCS	118	0	0	0.0	8.2	0	0	118	0	P	F	04/28/82	08/22/89		
TY-102	NCPLX	SOUND	IS/IP/CCS	64	0	14	0.0	6.6	14	0	0	64	P	FP	06/28/82	07/07/87		
TY-103	NCPLX	ASMD LKR	IS/IP/CCS	162	0	5	0.0	11.5	5	0	162	0	P	FP	07/09/82	08/22/89		
TY-104	NCPLX	ASMD LKR	IS/IP/CCS	46	3	12	0.0	0.0	15	0	43	0	P	FP	06/27/90	11/03/87		
TY-105	NCPLX	ASMD LKR	IS/IP/CCS	231	0	0	0.0	3.6	0	0	231	0	P	M	04/28/82	09/07/89		
TY-106	NCPLX	ASMD LKR	IS/IP/CCS	17	0	0	0.0	0.0	0	0	17	0	P	M	04/28/82	08/22/89		
6 SINGLE-SHELL TANKS			TOTALS:	638	3	31	0.0	29.9	34	0	571	64						
								U TANK FARM STATUS										
U-101	NCPLX	ASMD LKR	IS/IP	25	3	0	0.0	0.0	3	0	22	0	P	MP	04/28/82	06/19/79		
U-102	NCPLX	SOUND	/PI	375	18	150	0.0	0.0	175	168	43	314	P	MP	12/31/98	06/08/89		(e)
U-103	NCPLX	SOUND	/PI	468	13	205	0.0	0.0	229	218	12	443	P	FP	12/31/98	09/13/88		(e)-
U-104	NCPLX	ASMD LKR	IS/IP	122	0	7	0.0	0.0	7	0	122	0	P	MP	04/28/82	08/10/89		
U-105	NCPLX	SOUND	/PI	418	37	167	0.0	0.0	210	204	32	349	FM	PS	12/31/98	07/07/88		(e)
U-106	NCPLX	SOUND	/PI	226	15	83	0.0	0.0	112	98	0	211	F	PS	12/31/98	07/07/88		(e)
U-107	DSSF	SOUND	/PI	406	31	165	0.0	0.0	206	196	15	360	F	S	12/31/98	10/27/88		(e)
U-108	NCPLX	SOUND	/PI	468	24	199	0.0	0.0	229	223	29	415	F	S	12/31/98	09/12/84		(e)
U-109	NCPLX	SOUND	/PI	463	19	197	0.0	0.0	222	216	35	409	F	F	12/31/98	07/07/88		(e)
U-110	NCPLX	ASMD LKR	IS/PI	186	0	15	0.0	0.0	15	9	186	0	M	M	12/30/84	12/11/84		
U-111	DSSF	SOUND	/PI	329	0	142	0.0	0.0	149	142	26	303	PS	FPS	12/31/98	06/23/88		(e)
U-112	NCPLX	ASMD LKR	IS/IP	49	4	0	0.0	0.0	4	0	45	0	P	MP	02/10/84	08/03/89		
U-201	NCPLX	SOUND	IS/IP	5	1	0	0.0	0.0	1	0	4	0	M	S	08/15/79	08/08/89		
U-202	NCPLX	SOUND	IS/IP	5	1	0	0.0	0.0	1	0	4	0	M	S	08/15/79	08/08/89		
U-203	NCPLX	SOUND	IS/IP	3	1	0	0.0	0.0	1	0	2	0	M	S	08/15/79	06/13/89		
U-204	NCPLX	SOUND	IS/IP	3	1	0	0.0	0.0	1	0	2	0	M	S	08/15/79	06/13/89		
16 SINGLE-SHELL TANKS			TOTALS:	3551	168	1330	0.0	0.0	1565	1474	579	2804						
GRAND TOTAL				35172	1610	5995	10.9	4530.5	7868	6707	12063	21499						

TABLE E-6. INVENTORY AND STATUS BY TANK - SINGLE-SHELL TANKS

December 31, 1998

FOOTNOTES:

Total Waste is calculated as the sum of Sludge and Saltcake plus Supernate.

The category "Interim Isolated" (II) was changed to "Intrusion Prevention" (IP) in June 1993. See section C. "Tank and Equipment Code and Status Definitions."

Stabilization information from WHC-SD-RE-TI-178 SST STABILIZATION RECORD, latest revision, or SST Stabilization or Cognizant Engineer

(a) SX-104 Following information from Cognizant Engineer

Other priority work and cold weather problems combined to limit saltwell pumping in December. Pumping may be interrupted in January by work to relocate the alarm circuitry for some sme of the detectors in the transfer line.

Total Waste: 614 Kgal
Supernate: 0 Kgal
Drainable Interstitial: 151.8 Kgal
Pumped this month: 3.7 Kgal
Total Pumped: 162.2 Kgal
Drainable Liquid Remaining: 151.8 Kgal
Pumpable Liquid Remaining: 145.8 Kgal
Sludge: 136 Kgal
Saltcake: 478 Kgal

Pumping during December required 7,330 gal of dilution water and 966 gal of water for transfers.

(b) SX-106 Following information from Cognizant Engineer

Other priority work and cold weather problems combined to limit saltwell pumping in December. Pumping was also interrupted on December 30, 1998, in preparation for another transfer from 244-S to SY-102.

Total Waste: 523.1 Kgal
Supernate: 46.1 Kgal
Drainable Interstitial: 224 Kgal
Pumped this month: 3.2 Kgal
Total Pumped: 14.9 Kgal
Drainable Liquid Remaining: 270.1 Kgal
Pumpable Liquid Remaining: 249.1 Kgal
Sludge: 12 Kgal
Saltcake: 465 Kgal

Pumping during December required 2,846 gal of dilution water and 1,120 gal of water for transfer line flushes.

TABLE E-6. INVENTORY AND STATUS BY TANK - SINGLE-SHELL TANKS

December 31, 1998

FOOTNOTES:

(c) T-104 Following information from Cognizant Engineer
Pumping resumed June 7, 1998.

Total Waste: 329 Kgal
Supernate: 0 Kgal
Drainable Interstitial: 45.6 Kgal
Pumped this month: 2.1 Kgal
Total Pumped: 144.8 Kgal
Drainable Liquid Remaining: 45.6 Kgal
Pumpable Liquid Remaining: 42.6 Kgal
Sludge: 329 Kgal
Saltcake: 0 Kgal

Actual volume of liquid remaining to be pumped is still a rough estimate. Volumes will be corrected as porosity data becomes available with continued pumping.
Pumping during December required 1,066 gal of raw water.
A total of 24,594 gal of waste was removed from T-104 during 1998. No pumping occurred between the first of 1998 and June 6, 1998.

(d) T-110 Following information from Cognizant Engineer
Pumping began May 21, 1997.

Total Waste: 354 Kgal
Supernate: 0 Kgal
Drainable Interstitial: 54.5 Kgal
Pumped this month:1.9 Kgal
Total Pumped: 39.0 Kgal
Drainable Liquid Remaining: 54.5 Kgal
Pumpable Liquid Remaining: 51.5 Kgal
Sludge: 354 Kgal
Saltcake: 0 Kgal

Actual volume of liquid remaining to be pumped is still a rough estimate. Volumes will continue to be corrected as porosity data becomes available with continued pumping.
Pumping during December required 786 gal of raw water.
Dome elevation survey performed October 27, 1998; to correct "L" value to 41,053 on Data Sheet 2b with next procedure PCA.
A total of 21,749 gal of waste was removed from T-110 during 1998. No pumping occurred between mid-October 1997 and July 2, 1998.

(e) Volume estimates for the remaining 29 SSTs (excluding C-106) not yet interim stabilized were revised per HNF-2978, "Updated Jet Pump Durations for Interim Stabilization of Remaining Single-Shell Tanks," Rev. 0, R. D. Schrieber, July 15, 1998. This included supernate, saltcake, sludge, drainable liquid remaining, drainable interstitial liquid, and pumpable liquid remaining. Note: These volumes are as of July 1998, and do not reflect pumping which occurred in Tanks SX-104, SX-106, T-104, and T-110 since that date. Actual pumping volumes shown in footnotes above.

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APPENDIX F

PERFORMANCE SUMMARY

TABLE F-1. PERFORMANCE SUMMARY (Sheet 1 of 2)

WASTE VOLUMES (Kgallons)

December 31, 1998

INCREASES/DECREASES IN WASTE VOLUMES STORED IN DOUBLE-SHELL TANKS

SOURCE		THIS MONTH	FY1999 TO DATE
B PLANT		0	0
PUREX TOTAL (1)		0	0
PFP (1)		0	0
T PLANT (1)		0	0
S PLANT (1)		0	0
300 AREAS (1)		0	0
400 AREAS (1)		0	0
SULFATE WASTE -100 N (2)		0	0
C-106 SOLIDS (INCLUDING FLUSH)		2	11
TRAINING/X-SITE (9)		0	0
TANK FARMS (6)		2	7
SALTWELL LIQUID (8)		22	133
OTHER GAINS		5	43
Slurry increase (3)	5		
Condensate	5		
Instrument change (7)	0		
Unknown (5)	0		
OTHER LOSSES		-25	-42
Slurry decrease (3)	-11		
Evaporation (4)	-6		
Instrument change (7)	-4		
Unknown (5)	4		
EVAPORATED		0	0
GROUTED		0	0
TOTAL		0	152

Note: No waste due to BIO (Basis for Interim Operation) implementation

CUMULATIVE EVAPORATION - 1950 TO PRESENT WASTE VOLUME REDUCTION

FACILITY		
242-B EVAPORATOR (10)		7172
242-T EVAPORATOR (1950's) (10)		9181
IN-TANK SOLIDIFICATION UNIT 1 (10)		11876
IN-TANK SOLIDIFICATION UNIT 2 (10)		15295
IN-TANK SOLID. UNIT 1 & 2 (10)		7965
(after conversion of Unit 1 to a cooler for Unit 2)		8833
242-T (Modified) (10)		24471
242-S EVAPORATOR (10)		41983
242-A EVAPORATOR (11)		73689
242-A Evaporator was restarted April 15, 1994, after having been shut down since April 1989.		
Total waste reduction since restart:		9486
Campaign 94-1	2417 Kgal	
Campaign 94-2	2787 Kgal	
Campaign 95-1	2161 Kgal	
Campaign 96-1	1117 Kgal	
Campaign 97-1	351 Kgal	
Campaign 97-2	653 Kgal	

TABLE F-1. PERFORMANCE SUMMARY
(Sheet 2 of 2)

Footnotes:

INCREASES/DECREASES IN WASTE VOLUMES

(1) Including flush

(2) Sulfate waste is generated from ion exchange backflushing and sand filter clean out, resulting in sulfate waste.

(3) Slurry increase/growth is caused by gas generation within the waste.

(4) Aging waste tanks

(5) Unknown waste gains or losses

(6) Includes Tank Farms miscellaneous flushes

(7) Liquid level measurement instrument changes from the automatic FIC to manual tape (and vice versa) result in unusual gains or losses because the manual tape may rest on an uneven crust surface giving a different reading from that of the automatic FIC.

(8) Results from pumping of single-shell tanks to double-shell tanks.

(9) Tracks waste being sent to the double-shell tanks from the "Precampaign Training Run." Evaporator procedures require a training run at least once per year. This also includes pressure testing and flushing of cross-site transfer lines.

WASTE VOLUME REDUCTION

(10) Currently inoperative.

(11) Currently operative. The 242-A Evaporator-Crystallizer was started up March 1977, and shut down April 1989 because of regulatory issues, and remained shut down for subsequent upgrading. This evaporator operates under a vacuum, employing evaporative concentration with subsequent crystallization and precipitation of salt crystals (forming saltcake). The evaporator was restarted on April 15, 1994.

TABLE F-2. SUMMARY OF WASTE TRANSACTIONS IN THE DOUBLE-SHELL TANKS

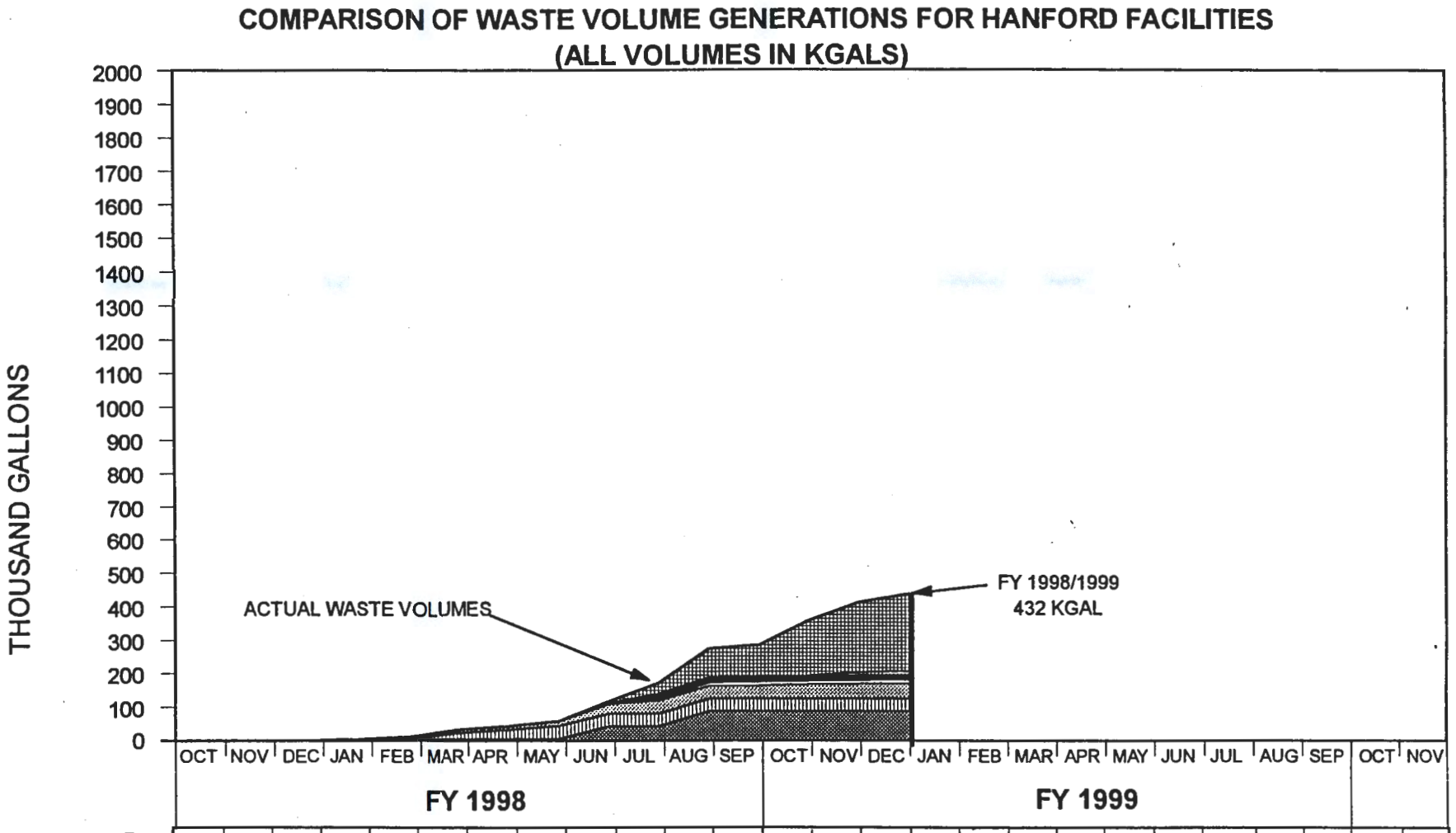
SUMMARY OF WASTE TRANSACTIONS IN THE DOUBLE-SHELL TANK (DST) SYSTEM FOR DECEMBER 1998:
ALL VOLUMES IN KGALS

- The DST system received waste transfers/additions from Tank Farms, SST Stabilization and Tank 106-C solids retrieval in December.
- There was a net change of +6 Kgals in the DST system for December 1998.
- The total DST inventory as of December 31, 1998 was 18,750 Kgals.
- There was no Saltwell Liquid (SWL) pumped to the East Area DSTs in December.
- There were 22 Kgals of Saltwell Liquid (SWL) pumped to the West Area DSTs (102-SY) in December.
- There were ~ 2 Kgals of solids pumped from Tank 106-C to Tank 102-AY in December,. This brings the total accumulative solids retrieved from Tank 106-C to ~11 Kgals.
- The projected SWL pumping volumes were updated this month. The new volumes reflect the most current SWL pumping schedule.
- The "Unusable Tank Space" volumes were updated this month. The new "Unusable Tank Space" volumes reflect the most current assumptions used for Waste Volume Projections.

DECEMBER 1998 DST WASTE RECEIPTS					
FACILITY GENERATIONS		OTHER GAINS ASSOCIATED WITH		OTHER LOSSES ASSOCIATED WITH	
SWL (West)	+22 Kgal (2SY)	SLURRY	+5 Kgal	SLURRY	-11 Kgal
Tank Farms	+2 Kgal (2AW, 1AZ)	CONDENSATE	+0 Kgal	CONDENSATE	-6 Kgal
Tank 106-C Solids	+2 Kgal (2AY)	INSTRUMENTATION	+0 Kgal	INSTRUMENTATION	-4 Kgal
TOTAL	+26 Kgal	UNKNOWN	+0 Kgal	UNKNOWN	-4 Kgal
		TOTAL	+ 5 Kgal	TOTAL	-25 Kgal

	ACTUAL DST WASTE RECEIPTS	PROJECTED DST WASTE RECEIPTS	MISC. DST CHANGES (+/-)	WVR	NET DST CHANGE	TOTAL DST VOLUME
OCT98	73	81	4	0	77	18675
NOV98	52	115	17	0	69	18744
DEC98	26	57	-20	0	6	18750
JAN99		122		0		
FEB99		74		0		
MAR99		135		0		
APR99		128		0		
MAY99		-736		0		
JUN99		204		0		
JUL99		177		0		
AUG99		127		0		
SEP99		149		0		

NOTE: The "PROJECTED DST WASTE RECEIPTS" numbers were updated in December 1998.



	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
SWL WEST	0	0	0	0	0	0	0	0	7	28	53	9	69	42	22											
SWL EAST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
100 AREA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
PFP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
106-C	0	0	0	0	0	0	0	0	0	0	0	0	0	9	2											
3/400 AREA	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0											
S PLANT	0	0	0	0	0	0	0	0	3	3	4	1	0	0	0											
T PLANT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
TANK FARMS	0	0	0	4	2	4	1	3	14	10	0	1	4	1	2											
B PLANT	0	0	0	0	0	18	8	11	0	0	0	0	0	0	0											
PUREX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
OTHER	0	0	0	0	5	0	0	0	35	0	44	0	0	0	0											

NOTE: The Other Category is for Waste Generations from, Evaporator Tranining, Pressure Tests, Cross-Site Transfers

FACILPAC

FIGURE F-1. COMPARISON OF WASTE VOLUME GENERATIONS FOR HANFORD FACILITIES
(All volumes in Kgals)

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APPENDIX G

MISCELLANEOUS UNDERGROUND STORAGE TANKS AND SPECIAL SURVEILLANCE FACILITIES

TABLE G-1. EAST AND WEST AREA MISCELLANEOUS UNDERGROUND STORAGE TANKS AND SPECIAL SURVEILLANCE FACILITIES

ACTIVE - still running transfers through the associated diversion boxes or pipeline encasements

December 31, 1998

FACILITY	LOCATION	PURPOSE (receives waste from:)	(Gallons)	MONITORED BY	REMARKS
EAST AREA					
241-A-302-A	A Farm	A-151 DB	959	SACS/ENRAF	Foamed over Catch Tank pump pit & div. box to prevent intrusion
241-ER-311	B Plant	ER-151, ER-152 DB	7113	SACS/CASS/FIC	Rain
241-AX-152	AX Farm	AX-152 DB	0	SACS/MT	Pumped 11/98
241-AZ-151	AZ Farm	AZ-702 condensate	7070	SACS/CASS/FIC	Volume changes daily - pumped to AZ-102 as needed
241-AZ-154	AZ Farm		25	SACS/CASS/MT	
244-BX-TK/SMP	BX Complex	DCRT - Receives from several farms	24634	SACS/MANUALLY	Using Manual Tape for tank
244-A-TK/SMP	A Complex	DCRT - Receives from several farms	7214	MCS/SACS/WTF	WTF
A-350	A Farm	Collects drainage	465	MCS/SACS/WTF	WTF pumped as needed
AR-204	AY Farm	RR Cars during transfer to rec. tanks	325	DIP TUBE	Alarms on CASS
A-417	A Farm		11757	SACS/DIP TUBE	WTF - pumped 4/98
CR-003-TK/SUMP	C Farm	DCRT	3938	MT/ZIP CORD	Zip cord in sump O/S 3/11/96, water intrusion, 1/98
WEST AREA					
241-TX-302-C	TX Farm	TX-154 DB	320	SACS/CASS/ENRAF	
241-U-301-B	U Farm	U-151, U-152, U-153, U-252 DB	8128	SACS/CASS/ENRAF	Returned to service 12/30/93
241-UX-302-A	U Plant	UX-154 DB	2092	SACS/CASS/ENRAF	
241-S-304	S Farm	S-151 DB	150	SACS/CASS/ENRAF	Replaced S-302-A, 10/91; ENRAF installed 7/98 Sump not alarming.
244-S-TK/SMP	S Farm	DCRT - Receives from several farms	16386	SACS/MANUALLY	CWF
244-TX-TK/SMP	TX Farm	DCRT - Receives from several farms	23276	SACS/MANUALLY	MT
Vent Station Catch Tank		Cross Country Transfer Line	339	SACS/MANUALLY	MT
		Total Active Facilities 18			

Note: Readings may be taken manually or automatically by FIC (or ENRAF). All FICs and manual ENRAFs connected to CASS. All tanks on CASS (either auto or manual) are also on the SACS database. If automatic connectiions to CASS are broken, readings are taken manually. Manual readings include readings taken by manual tape, manual FIC, or manual readings of automatic FIC (if CASS is printing "0"). Readings may also be taken by zip cord, which are acceptable but less accurate.

LEGEND:
- DB - Diversion Box
- DCRT - Double-Contained Receiver Tank
- TK - Tank
- SMP - Sump
- FIC - Food Instrument Corporation measurement device
- RS - Robert Shaw Instrument measurement device
- MFIC - Manual FIC
- MT - Manual Tape
- CWF - Weight Factor/SpG = Corrected Weight Factor
- CASS - Computer Automated Surveillance System
- SACS - Surveillance Automated Control System
- MCS - Monitor and Control System
- O/S - Out of Service
- ENRAF - Surface Level Measuring Device

TABLE G-2. EAST AREA INACTIVE MISC. UNDERGROUND STORAGE TANKS AND SPECIAL SURV. FACILITIES

INACTIVE - no longer receiving waste transfers

December 31, 1998

FACILITY	LOCATION	RECEIVED WASTE FROM:	(Gallons)	MONITORED BY	REMARKS
216-BY-201	BY Farm	TBP Waste Line	Unknown	NM	(216-BY)
241-A-302-B	A Farm	A-152 DB	5681	CASS/MT	Isolated 1985, Project B-138 Interim Stabilized 1990, Rain intrusion
241-AX-151	N of PUREX	PUREX	Unknown	NM	Isolated 1985
241-B-301-B	B Farm	B-151, B-152, B-153, B-252 DB	22250	NM	Isolated 1985 (1)
241-B-302-B	B Farm	B-154 DB	4930	NM	Isolated 1985 (1)
241-BX-302-A	BX Farm	BR-152, BX-153, BXR-152, BYR-152 DB	840	NM	Isolated 1985 (1)
241-BX-302-B	BX Farm	BX-154 DB	1040	NM	Isolated 1985 (1)
241-BX-302-C	BX Farm	BX-155 DB	870	NM	Isolated 1985 (1)
241-C-301-C	C Farm	C-151, C-152, C-153, C-252 DB	10470	NM	Isolated 1985 (1)
241-CX-70	Hot Semi-	Transfer lines	Unknown	NM	Isolated, Decommission Project,
241-CX-72	Works	Transfer lines	650	NM	See Dwg H-2-95-501, 2/5/87
241-ER-311A	SW B Plant	ER-151 DB	Unknown	NM	Isolated
244-AR VAULT	A Complex	Between farms & B-Plant	Unknown	NM	Not actively being used. Systems activated for final clean-out.
244-BXR-TK/SMP-001	BX Farm	Transfer lines	7200	NM	Interim Stabilization 1985 (1)
244-BXR-TK/SMP-002	BX Farm	Transfer lines	2180	NM	Interim Stabilization 1985 (1)
244-BXR-TK/SMP-003	BX Farm	Transfer lines	1810	NM	Interim Stabilization 1985 (1)
244-BXR-TK/SMP-011	BX Farm	Transfer lines	7100	NM	Interim Stabilization 1985 (1)
361-B-TANK	B Plant	Drainage from B-Plant	Unknown	NM	Interim Stabilization 1985 (1)
		Total East Area Inactive facilities	18		

LEGEND:
- DB - Diversion Box
- DCRT - Double-Contained Receiver Tank
- MT - Manual Tape
- CASS - Computer Automated Surveillance System
- TK - Tank
- SMP - Sump
- R - Usually denotes replacement
- NM - Not Monitored

(1) SOURCE: WASTE STORAGE TANK STATUS & LEAK DETECTION CRITERIA document

TABLE G-3. WEST AREA INACTIVE MISC. UNDERGROUND STORAGE TANKS AND SPECIAL SURV. FACILITIES

INACTIVE - no longer receiving waste transfers

December 31, 1998

FACILITY	LOCATION	RECEIVED WASTE FROM:	(Gallons)	MONITORED BY	REMARKS
216-TY-201	E. of TY Farm	Supernate from T-112	Unknown	NM	Isolated
231-W-151-001	N. of Z Plant	231-Z Floor drains	Unknown	NM	Inactive, last data 1974
231-W-151-002	N. of Z Plant	231-Z Floor drains	Unknown	NM	Inactive, last data 1974
240-S-302	S Farm	240-S-151 DB	8536	CASS/ENRAF	Assumed Leaker EPDA 85-04
241-S-302-A	S Farm	241-S-151 DB	0	CASS/FIC *	Assumed Leaker TF-EFS-90-042
			* FIC in Intrusion mode		Partially filled with grout 2/91, determined still assumed leaker after leak test
241-S-302-B	S Farm	S Encasements	Unknown	NM	Isolated 1985 (1)
241-SX-302	SX Farm	SX-151 DB, 151 TB	Unknown	NM	Isolated 1987
241-SX-304	SX Farm	SX-152 Transfer Box, SX-151 DB	Unknown	NM	Isolated 1985 (1)
241-T-301	T Farm	DB T-151, -151, -153, -252	Unknown	NM	Isolated 1985 (241-T-301B)
241-TX-302	TX Farm	TX-153 DB	Unknown	NM	Isolated 1985 (1)
241-TX-302-X-B	TX Farm	TX Encasements	Unknown	NM	Isolated 1985 (1)
241-TX-302-B	TX Farm	TX-155 DB	1600	CASS/MT	New MT installed 7/16/93
241-TX-302B(R)	E. of TX Farm	TX-155 DB	Unknown	NM	Isolated
241-TY-302-A	TY Farm	TX-153 DB	Unknown	NM	Isolated 1985 (1)
241-TY-302-B	TY Farm	TY Encasements	Unknown	NM	Isolated 1985 (1)
241-Z-8	E. of Z Plant	Recuplex waste	Unknown	NM	Isolated, 1974, 1975
242-T-135	T Evaporator	T Evaporator	Unknown	NM	Isolated
242-TA-R1	T Evaporator	Z Plant waste	Unknown	NM	Isolated
243-S-TK-1	N. of S Farm	Pers. Decon. Facility	Unknown	NM	Isolated
244-U-TK/SMP	U Farm	DCRT - Receives from several farms	Unknown	NM	Not yet in use
244-TXR VAULT	TX Farm	Transfer lines	Unknown	NM	Interim Stabilized, MT removed 1984 (1)
244-TXR-TK/SMP-001	TX Farm	Transfer lines	Unknown	NM	Interim Stabilized, MT removed 1984 (1)
244-TXR-TK/SMP-002	TX Farm	Transfer lines	Unknown	NM	Interim Stabilized, MT removed 1984 (1)
244-TXR-TK/SMP-003	TX Farm	Transfer lines	Unknown	NM	Interim Stabilized, MT removed 1984 (1)
270-W	SE of U Plant	Condensate from U-221	Unknown	NM	Isolated 1970
361-T-TANK	T Plant	Drainage from T-Plant	Unknown	NM	Isolated 1985 (1)
361-U-TANK	U Plant	Drainage from U-Plant	Unknown	NM	Interim Stabilzed, MT removed 1984 (1)

Total West Area inactive facilities 27

LEGEND:
- DB - Diversion Box, TB - Transfer Box
- DCRT - Double-Contained Receiver Tank
- TK - Tank
- SMP - Sump
- R - Usually denotes replacement
- FIC - Surface Level Monitoring Device
- MT - Manual Tape
- O/S - Out of Service
- CASS - Computer Automated Surveillance System
- NM - Not Monitored
- ENRAF - Surface Level Monitoring Device

(1) SOURCE: WASTE STORAGE TANK STATUS & LEAK DETECTION CRITERIA document

APPENDIX H

LEAK VOLUME ESTIMATES

TABLE H-1. SINGLE-SHELL TANK LEAK VOLUME ESTIMATES (Sheet 1 of 5)

December 31, 1998

Tank Number	Date Declared Confirmed or Assumed Leaker (3)	Volume Gallons (2)(4)	Associated KiloCuries 137 cs (10)	Interim Stabilized Date (12)	Leak Estimate Updated	Leak Estimate Reference
241-A-103	1987	5500 (9)		06/88	1987	(j)
241-A-104	1975	500 to 2500	0.8 to 1.8 (q)	09/78	1983	(a)(q)
241-A-105 (1)	1963	10000 to 277000	85 to 760 (b)	07/79	1991	(b)(c)
241-AX-102	1988	3000 (9)		09/88	1989	(h)
241-AX-104	1977	– (7)		08/81	1989	(g)
241-B-101	1974	– (7)		03/81	1989	(g)
241-B-103	1978	– (7)		02/85	1989	(g)
241-B-105	1978	– (7)		12/84	1989	(g)
241-B-107	1980	8000 (9)		03/85	1986	(d)(f)
241-B-110	1981	10000 (9)		03/85	1986	(d)
241-B-111	1978	– (7)		06/85	1989	(g)
241-B-112	1978	2000		05/85	1989	(g)
241-B-201	1980	1200 (9)		08/81	1984	(e)(f)
241-B-203	1983	300 (9)		06/84	1986	(d)
241-B-204	1984	400 (9)		06/84	1989	(g)
241-BX-101	1972	– (7)		09/78	1989	(g)
241-BX-102	1971	70000	50 (l)	11/78	1986	(d)
241-BX-108	1974	2500	0.5 (l)	07/79	1986	(d)
241-BX-110	1976	– (7)		08/85	1989	(g)
241-BX-111	1984 (14)	– (7)		03/95	1993	(g)(r)
241-BY-103	1973	<5000		11/97	1983	(a)
241-BY-105	1984	– (7)		N/A	1989	(g)
241-BY-106	1984	– (7)		N/A	1989	(g)
241-BY-107	1984	15100 (9)		07/79	1989	(g)
241-BY-108	1972	<5000		02/85	1983	(a)
241-C-101	1980	20000 (9)(11)		11/83	1986	(d)
241-C-110	1984	2000		05/95	1989	(g)
241-C-111	1968	5500 (9)		03/84	1989	(g)
241-C-201 (5)	1988	550		03/82	1987	(i)
241-C-202 (5)	1988	450		08/81	1987	(i)
241-C-203	1984	400 (9)		03/82	1986	(d)
241-C-204 (5)	1988	350		09/82	1987	(i)
241-S-104	1968	24000 (9)		12/84	1989	(g)
241-SX-104	1988	6000 (9)		N/A	1988	(k)
241-SX-107	1964	<5000		10/79	1983	(a)
241-SX-108 (6)(15)	1962	2400 to 35000	17 to 140 (m)(q)(u)	08/79	1991	(m)(q)(u)
241-SX-109 (6)(15)	1965	<10000	<40 (n)(u)	05/81	1992	(n)(u)
241-SX-110	1976	5500 (9)		08/79	1989	(g)
241-SX-111 (15)	1974	500 to 2000	0.6 to 2.4 (l)(q)(u)	07/79	1986	(d)(q)(u)
241-SX-112 (15)	1969	30000	40 (l)(u)	07/79	1986	(d)(u)
241-SX-113	1962	15000	8 (l)	11/78	1986	(d)
241-SX-114	1972	– (7)		07/79	1989	(g)
241-SX-115	1965	50000	21 (o)	09/78	1992	(o)
241-T-101	1992	7500 (9)		04/93	1992	(p)
241-T-103	1974	<1000 (9)		11/83	1989	(g)
241-T-106	1973	115000 (9)	40 (l)	08/81	1986	(d)
241-T-107	1984	– (7)		05/96	1989	(g)
241-T-108	1974	<1000 (9)		11/78	1980	(f)
241-T-109	1974	<1000 (9)		12/84	1989	(g)
241-T-111	1979, 1994 (13)	<1000 (9)		02/95	1994	(f)(t)
241-TX-105	1977	– (7)		04/83	1989	(g)
241-TX-107 (6)	1984	2500		10/79	1986	(d)
241-TX-110	1977	– (7)		04/83	1989	(g)
241-TX-113	1974	– (7)		04/83	1989	(g)
241-TX-114	1974	– (7)		04/83	1989	(g)
241-TX-115	1977	– (7)		09/83	1989	(g)
241-TX-116	1977	– (7)		04/83	1989	(g)
241-TX-117	1977	– (7)		03/83	1989	(g)
241-TY-101	1973	<1000 (9)		04/83	1980	(f)
241-TY-103	1973	3000	0.7 (l)	02/83	1986	(d)
241-TY-104	1981	1400 (9)		11/83	1986	(d)
241-TY-105	1960	35000	4 (l)	02/83	1986	(d)
241-TY-106	1959	20000	2 (l)	11/78	1986	(d)
241-U-101	1959	30000	20 (l)	09/79	1986	(d)
241-U-104	1961	55000	0.09 (l)	10/78	1986	(d)
241-U-110	1975	5000 to 8100 (9)	0.05 (q)	12/84	1986	(d)(q)
241-U-112	1980	8500 (9)		09/79	1986	(d)
67 Tanks		<750,000 - 1,050,000 (8)				

N/A = not applicable (not yet interim stabilized)

TABLE H-1. SINGLE-SHELL LEAK VOLUME ESTIMATES
(Sheet 2 of 5)

Footnotes:

(1) Current estimates [see reference(b)] are that 610 Kgallons of cooling water was added to Tank 241-A-105 from November 1970 to December 1978 to aid in evaporative cooling. In accordance with Dangerous Waste Regulations [Washington Administrative Code 173-303-070 (2)(a)(ii), as amended, Washington State Department of Ecology, 1990, Olympia, Washington], any of this cooling water that has been added and subsequently leaked from the tank must be classified as a waste and should be included in the total leak volume. In August 1991, the leak volume estimate for this tank was updated in accordance with the WAC regulations. Previous estimates excluded the cooling water leaks from the total leak volume estimates because the waste content (concentration) in the cooling water which leaked should be much less than the original liquid waste in the tank (the sludge is relatively insoluble). The total leak volume estimate in this report (10 Kgallons to 277 Kgallons) is based on the following (see References):

1. Reference (b) contains an estimate of 5 Kgallons to 15 Kgallons for the initial leak prior to August 1968.

2. Reference (b) contains an estimate of 5 Kgallons to 30 Kgallons for the leak while the tank was being sluiced from August 1968 to November 1970.

3. Reference (b) contains an estimate of 610 Kgallons of cooling water added to the tank from November 1970 to December 1978 but it was estimated that the leakage was small during this period. This reference contains the statement "Sufficient heat was generated in the tank to evaporate most, and perhaps nearly all, of this water." This results in a low estimate of zero gallons leakage from November 1970 to December 1978.

4. Reference (c) contains an estimate the 378 to 410 Kgallons evaporated out of the tank from November 1970 to December 1978. Subtracting the minimum evaporation estimate from the cooling water added estimate provides a range from 0 to 232 Kgallons of cooling water leakage from November 1970 to December 1978.

	Low Estimate	High Estimate
Prior to August 1968	5,000	15,000
August 1968 to November 1970	5,000	30,000
November 1970 to December 1978	0	232,000
Totals	10,000	277,000

(2) These leak volume estimates do not include (with some exceptions), such things as: (a) cooling/raw water leaks, (b) intrusions (rain infiltration) and subsequent leaks, (c) leaks inside the tank farm but not through the tank liner (surface leaks, pipeline leaks, leaks at the joint for the overflow or fill lines, etc.), and (d) leaks from catch tanks, diversion boxes, encasements, etc.

(3) In many cases, a leak was suspected long before it was identified or confirmed. For example, reference (d) shows that Tank 241-U-104 was suspected of leaking in 1956. The leak was "confirmed" in 1961. This report lists the "assumed leaker" date of 1961. Using present standards, Tank 241-U-104 would have been declared an assumed leaker in 1956. In 1984, the criteria designations of "suspected leaker," "questionable integrity," "confirmed leaker," "declared leaker," "borderline" and "dormant," were merged into one category now reported as "assumed leaker." See reference (f) for explanation of when, how long, and how fast some of the tanks leaked. It is highly likely that there have been undetected leaks from single-shell tanks because of the nature of their design and instrumentation.

(4) There has been an effort in the past few years to re-evaluate these leak volume estimates; however, the activity is not currently funded.

TABLE H-1. SINGLE-SHELL TANK LEAK VOLUME ESTIMATES
(Sheet 3 of 5)

(5) The leak volume estimate date for these tanks is before the "declared leaker" date because the tank was in a "suspected leaker" or "questionable integrity" status; however, a leak volume had been estimated prior to the tank being reclassified.

(6) The increasing radiation levels in drywells and laterals associated with these three tanks could be indicative of a continuing leak or movement of existing radio nuclides in the soil. There is no conclusive way to confirm these observations.

(7) Methods were used to estimate the leak volumes from these 19 tanks based on the assumption that their cumulative leakage is approximately the same as for 18 of the 24 tanks identified in footnote (9). For more details see reference (g). The total leak volume estimate for these tanks is 150 Kgallons (rounded to the nearest Kgallons), for an average of approximately 8 Kgallons for each of 19 tanks.

(8) The total has been rounded to the nearest 50 Kgallons. Upper bound values were used in many cases in developing these estimates. It is likely that some of these tanks have not actually leaked.

(9) Leak volume estimate is based solely on observed liquid level decreases in these tanks. This is considered to be the most accurate method for estimating leak volumes.

(10) The curie content shown is as listed in the reference document and is not decayed to a consistent date: therefore, a cumulative total is inappropriate.

(11) Tank 241-C-101 experienced a liquid level decrease in the late 1960s and was taken out of service and pumped to a "minimum heel" in December 1969. In 1970, the tank was classified as a "questionable integrity" tank. Liquid level data show decreases in level throughout the 1970s and the tank was saltwell pumped during the 1970s, ending in April 1979. The tank was reclassified as a "confirmed leaker" in January 1980. See references (q) and (s); refer to reference (s) for information on the potential for there to have been leaks from other C-farm tanks (specifically, C-102, C-103, and C-109).

(12) These dates indicate when the tanks were declared to be interim stabilized. In some cases, the official interim stabilization documents were issued at a later date. Also, in some cases, the field work associated with interim stabilization was completed at an earlier date.

(13) Tank T-111 was declared an assumed re-leaker on February 28, 1994, due to a decreasing trend in surface level measurement. This tank was pumped, and interim stabilization completed on February 22, 1995.

(14) Tank BX-111 was declared an assumed re-leaker in April 1993. Preparations for pumping were delayed, following an administrative hold placed on all tank farm operations in August 1993. Pumping resumed and the tank was declared interim stabilized on March 15, 1995.

(15) The leak volume and curie release estimates on SX-108, SX-109, SX-111, and SX-112 have been re-evaluated using a Historical Leak Model [see reference (u)]. In general, the model estimates are much higher than the values listed in the table, both for volume and curies released. The values listed in the table do not reflect this revised estimate because, "In particular, it is worth emphasizing that this report was never meant to be a definitive update for the leak baseline at the Hanford Site. It was rather meant to be an attempt to view the issue of leak inventories with a new and different methodology." (This quote is from the first page of the referenced report). Therefore, an uncertainty analysis to determine the applicability of this methodology is currently in progress.

TABLE H-1. SINGLE-SHELL TANK LEAK VOLUME ESTIMATES
(Sheet 4 of 5)

References:

(a) Murthy, K.S., et al, June 1983, *Assessment of Single-Shell Tank Residual Liquid Issues at Hanford Site, Washington*, PNL-4688, Pacific Northwest Laboratory, Richland, Washington.

(b) WHC, 1991a, *Tank 241-A-105 Leak Assessment*, WHC-MR-0264, Westinghouse Hanford Company, Richland, Washington.

(c) WHC, 1991b, *Tank 241-A-105 Evaporation Estimate 1970 Through 1978*, WHC-EP-0410, Westinghouse Hanford Company, Richland, Washington.

(d) Smith, D. A., January 1986, *Single-Shell Tank Isolation Safety Analysis Report*, SD-WM-SAR-006, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

(e) McCann, D. C., and T. S. Vail, September 1984, *Waste Status Summary*, RHO-RE-SR-14, Rockwell Hanford Operations, Richland, Washington.

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(Sheet 5 of 5)

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APPENDIX I

INTERIM STABILIZATION STATUS
CONTROLLED, CLEAN, AND STABLE STATUS

TABLE I-1. SINGLE-SHELL TANKS INTERIM STABILIZATION STATUS (Sheet 1 of 3)

December 31, 1998

Tank Number	Tank Integrity	Interim Stabil. Date (1)	Stabil. Method	Tank Number	Tank Integrity	Interim Stabil. Date (1)	Stabil. Method	Tank Number	Tank Integrity	Interim Stabil. Date (1)	Stabil. Method
A-101	SOUND	N/A		C-101	ASMD LKR	11/83	AR	T-108	ASMD LKR	11/78	AR
A-102	SOUND	08/89	SN	C-102	SOUND	09/95	JET	T-109	ASMD LKR	12/84	AR
A-103	ASMD LKR	06/88	AR	C-103	SOUND	N/A		T-110	SOUND	N/A	
A-104	ASMD LKR	09/78	AR	C-104	SOUND	09/89	SN	T-111	ASMD LKR	02/95	JET
A-105	ASMD LKR	07/79	AR	C-105	SOUND	10/95	AR (5)	T-112	SOUND	03/81	AR(2)(3)
A-106	SOUND	08/82	AR	C-106	SOUND	N/A		T-201	SOUND	04/81	AR (3)
AX-101	SOUND	N/A		C-107	SOUND	09/85	JET	T-202	SOUND	08/81	AR
AX-102	ASMD LKR	09/88	SN	C-108	SOUND	03/84	AR	T-203	SOUND	04/81	AR
AX-103	SOUND	08/87	AR	C-109	SOUND	11/83	AR	T-204	SOUND	08/81	AR
AX-104	ASMD LKR	08/81	AR	C-110	ASMD LKR	05/95	JET	TX-101	SOUND	02/84	AR
B-101	ASMD IKR	03/81	SN	C-111	ASMD LKR	03/84	SN	TX-102	SOUND	04/83	JET
B-102	SOUND	08/85	SN	C-112	SOUND	09/90	AR	TX-103	SOUND	08/83	JET
B-103	ASMD IKR	02/85	SN	C-201	ASMD LKR	03/82	AR	TX-104	SOUND	09/79	SN
B-104	SOUND	06/85	SN	C-202	ASMD LKR	08/81	AR	TX-105	ASMD LKR	04/83	JET
B-105	ASMD IKR	12/84	AR	C-203	ASMD LKR	03/82	AR	TX-106	SOUND	06/83	JET
B-106	SOUND	03/85	SN	C-204	ASMD LKR	09/82	AR	TX-107	ASMD LKR	10/79	AR
B-107	ASMD LKR	03/85	SN	S-101	SOUND	N/A		TX-108	SOUND	03/83	JET
B-108	SOUND	05/85	SN	S-102	SOUND	N/A		TX-109	SOUND	04/83	JET
B-109	SOUND	04/85	SN	S-103	SOUND	N/A		TX-110	ASMD LKR	04/83	JET
B-110	ASMD LKR	12/84	AR	S-104	ASMD LKR	12/84	AR	TX-111	SOUND	04/83	JET
B-111	ASMD LKR	06/85	SN	S-105	SOUND	09/88	JET	TX-112	SOUND	04/83	JET
B-112	ASMD LKR	05/85	SN	S-106	SOUND	N/A		TX-113	ASMD LKR	04/83	JET
B-201	ASMD LKR	08/81	AR (3)	S-107	SOUND	N/A		TX-114	ASMD LKR	04/83	JET
B-202	SOUND	05/85	AR	S-108	SOUND	12/96	JET (7)	TX-115	ASMD LKR	09/83	JET
B-203	ASMD LKR	06/84	AR	S-109	SOUND	N/A		TX-116	ASMD LKR	04/83	JET
B-204	ASMD LKR	06/84	AR	S-110	SOUND	01/97	JET (8)	TX-117	ASMD LKR	03/83	JET
BX-101	ASMD LKR	09/78	AR	S-111	SOUND	N/A		TX-118	SOUND	04/83	JET
BX-102	ASMD LKR	11/78	AR	S-112	SOUND	N/A		TY-101	ASMD LKR	04/83	JET
BX-103	SOUND	11/83	AR(2)	SX-101	SOUND	N/A		TY-102	SOUND	09/79	AR
BX-104	SOUND	09/89	SN	SX-102	SOUND	N/A		TY-103	ASMD LKR	02/83	JET
BX-105	SOUND	03/81	SN	SX-103	SOUND	N/A		TY-104	ASMD LKR	11/83	AR
BX-106	SOUND	07/95	SN	SX-104	ASMD LKR	N/A		TY-105	ASMD LKR	02/83	JET
BX-107	SOUND	09/90	JET	SX-105	SOUND	N/A		TY-106	ASMD LKR	11/78	AR
BX-108	ASMD LKR	07/79	SN	SX-106	SOUND	N/A		U-101	ASMD LKR	09/79	AR
BX-109	SOUND	09/90	JET	SX-107	ASMD LKR	10/79	AR	U-102	SOUND	N/A	
BX-110	ASMD LKR	08/85	SN (4)	SX-108	ASMD LKR	08/79	AR	U-103	SOUND	N/A	
BX-111	ASMD LKR	03/95	JET	SX-109	ASMD LKR	05/81	AR	U-104	ASMD LKR	10/78	AR
BX-112	SOUND	09/90	JET	SX-110	ASMD LKR	08/79	AR	U-105	SOUND	N/A	
BY-101	SOUND	05/84	JET	SX-111	ASMD LKR	07/79	SN	U-106	SOUND	N/A	
BY-102	SOUND	04/95	JET	SX-112	ASMD LKR	07/79	AR	U-107	SOUND	N/A	
BY-103	ASMD LKR	11/97	JET(10)	SX-113	ASMD LKR	11/78	AR	U-108	SOUND	N/A	
BY-104	SOUND	01/85	JET	SX-114	ASMD LKR	07/79	AR	U-109	SOUND	N/A	
BY-105	ASMD LKR	N/A		SX-115	ASMD LKR	09/78	AR	U-110	ASMD LKR	12/84	AR
BY-106	ASMD LKR	N/A		T-101	ASMD LKR	04/93	SN	U-111	SOUND	N/A	
BY-107	ASMD LKR	07/79	JET	T-102	SOUND	03/.81	AR(2)(3)	U-112	ASMD LKR	09/79	AR
BY-108	ASMD LKR	02/85	JET	T-103	ASMD LKR	11/83	AR	U-201	SOUND	08/79	AR
BY-109	SOUND	07/97	JET(9)	T-104	SOUND	N/A		U-202	SOUND	08/79	SN
BY-110	SOUND	01/85	JET	T-105	SOUND	06/87	AR	U-203	SOUND	08/79	AR
BY-111	SOUND	01/85	JET	T-106	ASMD LKR	08/81	AR	U-204	SOUND	08/79	SN
BY-112	SOUND	06/84	JET	T-107	ASMD LKR	05/96	JET				

LEGEND:

AR = Administratively interim stabilized
JET = Saltwell jet pumped to remove drainable interstitial liquid
SN = Supernate pumped (Non-Jet pumped)
N/A = Not yet interim stabilized
ASMD LKR = Assumed Leaker

Interim Stabilized Tanks	119
Not Yet Interim Stabilized	30
Total Single-Shell Tanks	149

TABLE I-1. SINGLE-SHELL TANKS INTERIM STABILIZATION STATUS (sheet 2 of 3)

Footnotes:

(1) These dates indicate when the tanks were actually interim stabilized. In some cases, the official interim stabilization documents were issued at a later date.

(2) Originally, seven tanks (B-104, B-110, B-111, BX-103, T-102, and T-112) did not meet current established supernatant and interstitial liquid interim stabilization criteria, but did meet the criteria in existence when they were declared interim stabilized.

B-110, B-111, U-110 were determined to have met current interim stabilization criteria, per WHC-SD-WM-ER-516-REV 0, "Interim Stabilization Status of SSTs B-104, B-110, B-111, T-102, T-112, and U-110," and WHC-SD-WM-ER-518-REV 0, "Investigation of Liquid Intrusion in 241-BX-103," both dated October 5, 1995.

B-104, BX-103, T-102, T-112 have been determined to meet current interim stabilization criteria as of September 30, 1996, per memo 9654456, J. H. Wicks to Dr. J. K. McClusky, DOE-RL.

B-202 was determined to no longer meet the current established criteria for 200-series tanks due to a steady increase in the surface level indicating an ongoing intrusion based on a comparison of in-tank videos and subsequent evaluation in March 1996.

(3) Original Interim Stabilization data are missing on four tanks: B-201, T-102, T-112, and T-201.

(4) BX-110 was interim stabilized by Supernate Pumping in August 1985. Jet pumping began in December 1993 and soon stopped because of equipment failure. Due to low net volume pumped, major equipment failure, and ALARA, it was decided jet pumping would not resume. An in-tank video was taken in October 1994. Re-evaluation after review of the video indicated 1.5 Kgallons of waste was pumped. (Almost 3 Kgallons of water flushes were needed to produce 1.5 Kgallons tank waste.)

(5) C-105 was interim stabilized administratively on October 30, 1995. No jet pumping occurred in this tank, nor does interstitial liquid level data exist for this tank. There are no diptubes or LOWs installed. Approximately 12 Kgallons of liquid waste was evaporated between May 1993 and October 1995. An in-tank video taken August 30, 1995, revealed a shallow supernatant pool surrounded by a 5-8 foot solids waste shore. The volume of supernate is estimated as 2 Kgallons. The tank currently meets the established criteria for declaring single-shell tanks Interim Stabilized.

(6) T-107 was interim stabilized by Jet Pumping in May 1996. Pumping was completed in March, and an in-tank video taken in May showed no supernate visible on the surface. The surface has an irregular contour of mostly sludge, and the elevation differences between high and low points appear to be about four inches.

(7) S-108 was interim stabilized by Jet Pumping in December 1996. Pumping was completed in September and an in-tank video taken in December showed no supernate visible on the surface of the waste, which appears to be saltcake. The video shows a relatively level surface with some caving and crowning. Total waste is 448.7 Kgallons, with drainable liquids 4.0 Kgallons and no pumpable liquids.

(8) S-110 was interim stabilized by Jet Pumping in January 1997. Pumping was completed in July 1996, and an in-tank video taken in December showed no supernate visible on the surface of the waste, which appears to be saltcake. The level is not consistent and there appears to have been some caving and crowning. Total waste is 389.0 Kgallons, with drainable liquids 29.8 Kgallons and pumpable liquids 23.4 Kgallons.

(9) BY-109 was interim stabilized by Jet Pumping in July 1997. Pumping was completed in May 1997, and an in-tank video taken in June indicated there is a relatively uniform, slightly concave, crusty/cracked contour over most of the surface with no visible supernate. Total waste is 290.0 Kgallons, with drainable liquids 36.7 Kgallons, and pumpable liquids 20.3 Kgallons.

TABLE I-1. SINGLE-SHELL TANKS INTERIM STABILIZATION STATUS (sheet 3 of 3)

(10) BY-103 was interim stabilized in November 1997, after completion of jet pumping in September. An in-tank video taken in February 1997 showed no visible surface liquid and no evidence of an intrusion. The waste was dry and flaky. Dried, caked waste was suspended from many of the pipes and pieces of process equipment. The overall surface of the waste seemed to slump slightly towards the center of the tank. Total waste is 414 Kgallons, with drainable liquids 38.3 Kgallons, and pumpable liquids 31.9 Kgallons.

TABLE I-2. TRI-PARTY AGREEMENT SINGLE-SHELL TANK INTERIM STABILIZATION SCHEDULE

December 31, 1998

As part of the Controlled, Clean, and Stable mission, the Single-Shell Tank Interim Stabilization Project goal is to mitigate the risk to the environment from a leak release from aging SSTs, by removing as much of the drainable liquid as practical, for safe storage prior to full waste retrieval.

New TPA milestones were negotiated effective September 23, 1996, to allow greater flexibility in the sequencing of tanks, in light of the latest technical information regarding tank waste safety status and watch list concerns.

Milestone	Description	Due Date	Actual Date	Comments
M-41-20	Start Interim Stabilization of 4 Single-Shell Tanks	9/30/96	3/24/96	S-108, S-110, T-104, and T-107 started.
M-41-21	Start Interim Stabilization of 2 Single-Shell Tanks	5/31/97 (1)	5/12/97	BY-109 started 9/10/96; T-110 started 5/12/97
M-41-22	Start Interim Stabilization of 6 Single-Shell Tanks	9/30/97 (2)(4)		BY-103 started 9/29/97, SX-104 started 9/26/97
M-41-23	Start Interim Stabilization of 8 Single-Shell Tanks	3/31/98 (3)(4)		
M-41-24	Start Interim Stabilization of 9 Single-Shell Tanks	9/30/98 (4)		
M-41-25	Start Interim Stabilization of 3 Single-Shell Tanks	3/31/99 (4)		
M-41-26	Start Interim Stabilization of 2 Single-Shell Tanks	9/30/99 (4)		
M-41-27	Complete Saltwell Pumping of Single-Shell Tanks	9/30/00 (4)		
M-41-00	Complete Interim Stabilization of Single-Shell Tanks including Intrusion Prevention	9/30/00 (4)		

(1) On March 13, 1997, Department of Ecology (Ecology) approved Change Control Form M-41-96-03, extending M-41-21 from March 31 to May 31, 1997.

(2) Change Control Form M-41-97-01 was sent to Ecology on June 27, 1997; Dispute Resolution invoked on July 16, 1997. This Change Request was denied by the Director of Ecology on February 10, 1998.

(3) Change Control Form M-41-97-02 was sent to Ecology on December 29, 1997. Dispute Resolution invoked on January 13, 1998. This Change Request was denied by the Director of Ecology on March 10, 1998.

(4) Path Forward Plan submitted to Ecology on April 15, 1998, projects completion date of September 30, 2004.

TABLE I-3. SINGLE-SHELL TANKS STABILIZATION STATUS SUMMARY

December 31, 1998

Partial Interim Isolated (PI)

EAST AREA	
A-101	
A-102	
AX-101	
BY-102	
BY-103	
BY-105	
BY-106	
BY-109	
C-103	
C-105	
C-106	
East Area	11

WEST AREA	
S-101	
S-102	
S-103	
S-106	
S-107	
S-108	
S-109	
S-110	
S-111	
S-112	
SX-101	
SX-102	
SX-103	
SX-104	
SX-105	
SX-106	
T-101	
T-104	
T-107	
T-110	
T-111	
U-102	
U-103	
U-105	
U-106	
U-107	
U-108	
U-109	
U-110	
U-111	
West Area	29
Total	40

Intrusion Prevention Completed (IP)

EAST AREA	
A-103	
A-104	
A-105	
A-106	
AX-102	
AX-103	
AX-104	
B-FARM - 16 tanks	
BX-FARM - 12 tanks	
BY-101	
BY-104	
BY-107	
BY-108	
BY-110	
BY-111	
BY-112	
C-101	
C-102	
C-104	
C-107	
C-108	
C-109	
C-110	
C-111	
C-112	
C-201	
C-202	
C-203	
C-204	
East Area	55

WEST AREA	
S-104	
S-105	
SX-107	
SX-108	
SX-109	
SX-110	
SX-111	
SX-112	
SX-113	
SX-114	
SX-115	
T-102	
T-103	
T-105	
T-106	
T-108	
T-109	
T-112	
T-201	
T-202	
T-203	
T-204	
TX-FARM - 18 tanks	
TY-FARM - 6 tanks	
U-101	
U-104	
U-112	
U-102	
U-202	
U-203	
U-204	
West Area	53
Total	108

Controlled, Clean, and Stable (CCS)

EAST AREA	
BX-FARM - 12 Tanks	
East Area	12

WEST AREA	
TX-FARM - 18 tanks	
TY FARM - 6 tanks	
West Area	24
Total	36

Note: CCS activities have been deferred until funding is available.

Interim Stabilized (IS)

EAST AREA	
A-102	
A-103	
A-104	
A-105	
A-106	
AX-102	
AX-103	
AX-104	
B-FARM - 16 tanks	
BX-FARM - 12 tanks	
BY-101	
BY-102	
BY-103	
BY-104	
BY-107	
BY-108	
BY-109	
BY-110	
BY-111	
BY-112	
C-101	
C-102	
C-104	
C-105	
C-107	
C-108	
C-109	
C-110	
C-111	
C-112	
C-201	
C-202	
C-203	
C-204	
East Area	60

WEST AREA	
S-104	
S-105	
S-108	
S-110	
SX-107	
SX-108	
SX-109	
SX-110	
SX-111	
SX-112	
SX-113	
SX-114	
SX-115	
T-101	
T-102	
T-103	
T-105	
T-106	
T-107	
T-108	
T-109	
T-111	
T-112	
T-201	
T-202	
T-203	
T-204	
TX-FARM - 18 tanks	
TY-FARM - 3 tanks	
U-101	
U-104	
U-110	
U-112	
U-201	
U-202	
U-203	
U-204	
West Area	59
Total	119

SINGLE SHELL TANK FARMS
Interim Stabilization Progress Status

Interim Stabilized	119
Pumping In Progress	4
Retrieval	1
Pumping Planned	25
TOTAL SSTs	**149**

Status as of December 31, 1998 - Updated Quarterly

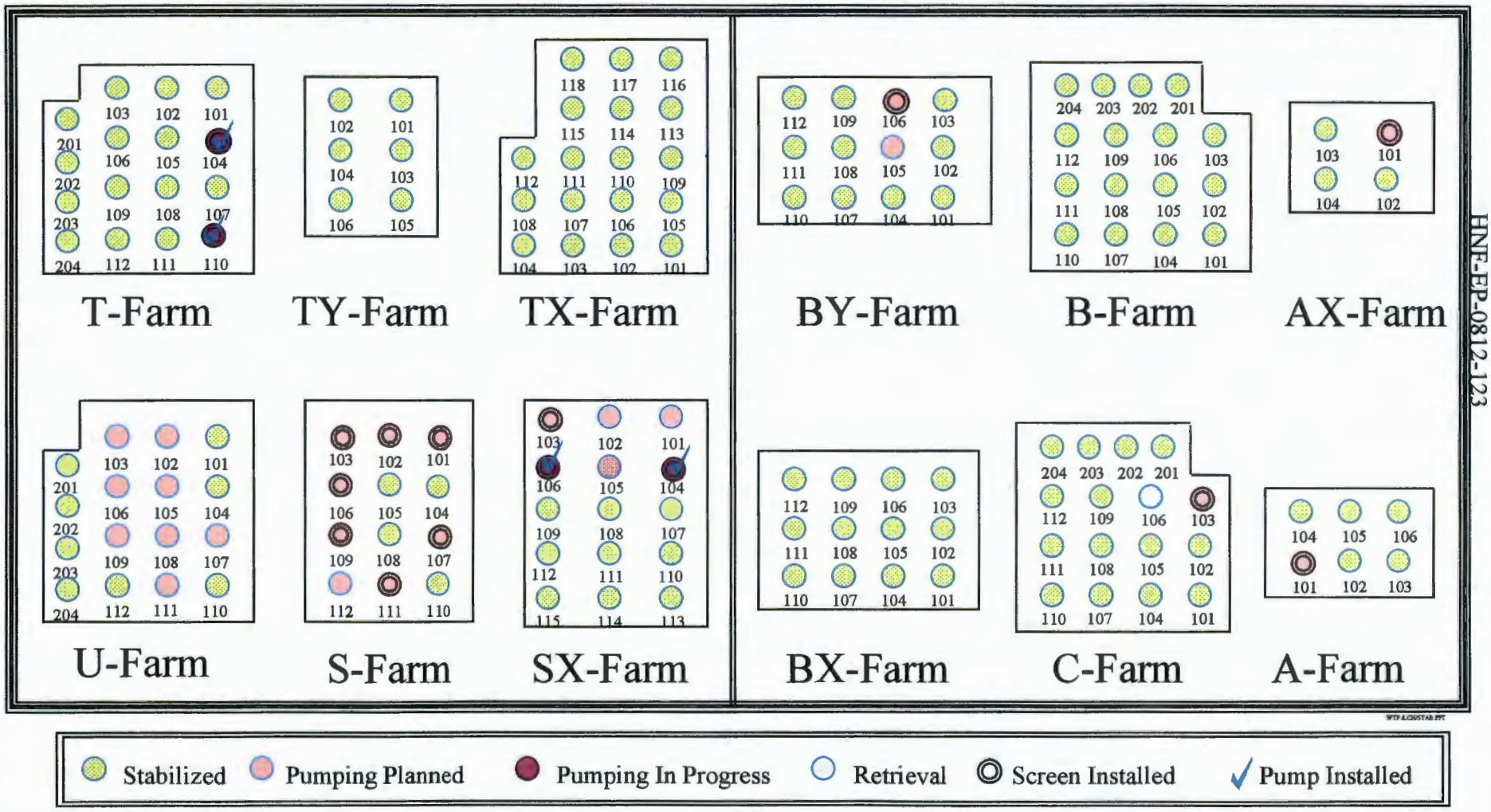


Figure I-1. SINGLE SHELL TANKS INTERIM STABILIZATION PROGRESS STATUS

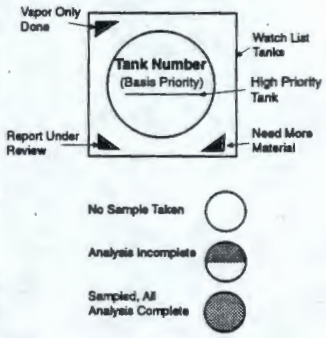
APPENDIX J

CHARACTERIZATION PROGRESS STATUS

Hanford Tank Farm Facilities

200 East and West

Characterization Progress Status

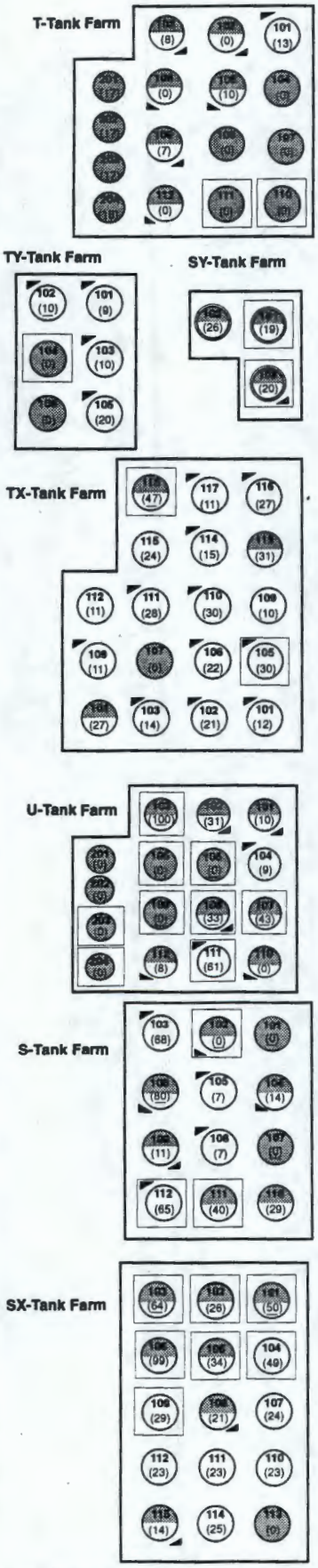


All tanks 75 ft. dia. except 200 series tanks which are 20 ft. dia. @ 55,000 gal

139	Tanks Sampled (Solid, Liquids)
25	Tanks Sampled (Vapor Only)
507	Samples Taken
55	Tanks - All Analyses Completed

Status as of DECEMBER 31, 1998

200 West



200 East

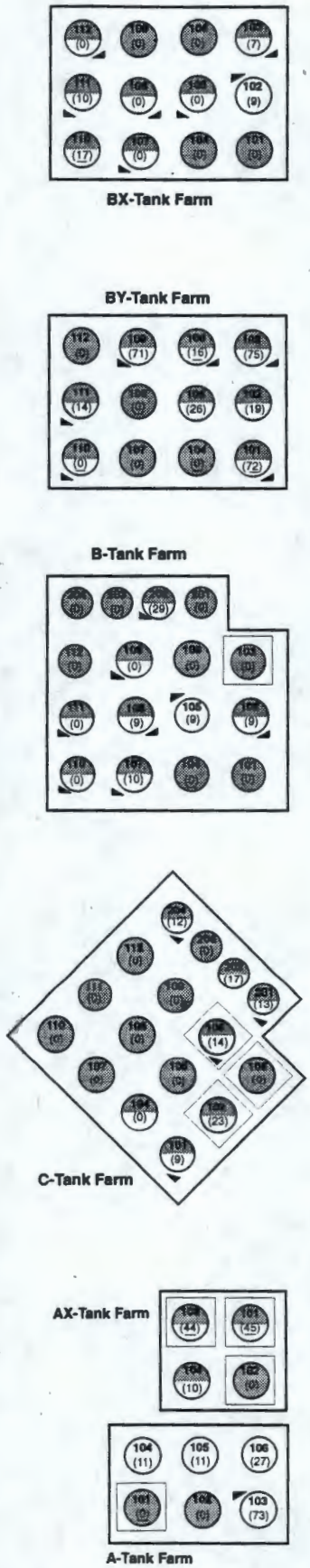


Figure J-1

2G95120163.3 (12/31/98)

FIGURE J-1. CHARACTERIZATION PROGRESS STATUS CHART LEGEND
(Sheet 2 of 2)

December 31, 1998

200 East/West	The chart divides the two areas.
Tank Farms	Each tank farm is represented by a rough schematic of the tank layout and a heading naming the farm.
Circles	Tanks are depicted by a circle for single-shell tanks and a double circle for double-shell tanks.
Boxes	A thin line box around a tank inside a tank farm denotes "Watch List" status, in concurrence with Table A-1 of this document.
Numbers in Circles	The top number is the tank number. The number in parentheses is a weighted priority number, described in WHC-SD-WM-TA-164, "Tank Waste Characterization Basis." The numbers can be compared to each other to gain appreciation of relative priority: the higher the number, the greater the priority to sample and analyze.
Underlined Numbers	If a number in parenthesis is underlined, it is denoted as a "Characterization Basis Tank," as described in WHC-SD-WM-TA-164, "Tank Waste Characterization Basis." These are key tanks taken from the priority list that are of principal interest to the Characterization Program.
Circle Shading	The shading in the circle indicates the degree to which sampling and analysis are complete per requirements described in applicable Data Quality Objectives (DQOs). If blank, no characterization sampling has taken place. If fully shaded, the sampling and analysis are complete for each DQO applicable to that tank. Tanks in which characterization has begun but is not complete are designated by being half shaded.
Corner Triangles	Small triangles near a tank circle give further information on half-shaded tanks. Upper left corner triangles indicate that vapor samples have been taken from the tank. Lower left-hand corner triangles indicate that the tank has been sampled, analyzed, and a formal report has been written on the condensed phase sampling. Further status of the tank will be determined after review of the report is complete. Lower right-hand corner triangles indicate that some review has been completed and it has been determined that more sampling is needed to resolve the DQO requirements. Absence of triangles from a half shaded tank indicates recent condensed phase sampling.

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