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Tank Farm Surveillance and Waste Status Summary Report for December 1993

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

Westinghouse
Hanford Company Richland, Washington

Hanford Operations and Engineering Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10530

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**TANK FARM SURVEILLANCE AND WASTE STATUS
SUMMARY REPORT FOR DECEMBER 1993**

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 49 smaller catch 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 Operation 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
$^{\circ}\text{F} = \left(\frac{9}{5} ^{\circ}\text{C}\right) + 32$		
1 Btu/h = 2.930711 E-01 watts (International Table)		

**TANK FARM SURVEILLANCE AND WASTE STATUS SUMMARY
REPORT FOR DECEMBER 1993
SUMMARY**

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

I. WASTE TANK STATUS

Category	Quantity	Date of Last Change
In-Service Tanks ^c	28 double-shell	10/86
Out-of-Service Tanks ^a	149 single-shell	07/88
Assumed Leaker Tanks ^f	67 single-shell	7/93
Sound Tanks	28 double-shell 82 single-shell	1986 7/93
Interim Stabilized Tanks ^{b,d}	106 single-shell	04/93
Not Interim Stabilized ^f	43 single-shell	04/93
Intrusion Prevention Completed ^e	98 single-shell	09/91
Watch List Tanks ^g	45 single-shell 6 double-shell	12/93 ^h 6/93
Total	51 tanks	

^a Although all 149 single-shell tanks were removed from service (i.e., no longer authorized to receive waste) as of November 21, 1980, the category of "Out-of-Service" was not established until July 1988.

^b Of the 106 tanks classified as interim stabilized, 59 are listed as assumed leakers. The total of 106 interim stabilized tanks includes six tanks that do not meet current established supernatant and interstitial liquid stabilization criteria: B-104, B-110, B-111, T-102, T-112, and U-110. (The six tanks did meet the criteria in existence when they were declared interim stabilized). B-110, B-111, and U-110 are assumed leakers but surveillance data do not show an indication of a continuing leak.

^c Six double-shell tanks listed as "in service" 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 45 single-shell tanks on Watch Lists, 19 have been Interim Stabilized.

^e Of the 45 single-shell tanks on Watch Lists, 28 have completed Intrusion Prevention (this category replaced Interim Isolation). See Appendix C, Tank and Equipment Codes and Status Definitions, for "Intrusion Prevention" definition.

^f Eight of the tanks are both assumed leakers and not Interim Stabilized. See Appendix I, Leak Volume Estimates, for more details. Tank SX-102 was declared an assumed leaker in May, and reclassified as Sound in July, 1993. See "Waste Tank Investigations" section of the July 1993 report for more details.

^g See Tables A-1 through A-5 for more information on Watch List Tanks. Four tanks (S-102, SX-106, TX-118, U-107) are currently on more than one Watch List.

^h Dates for the Watch List tanks are "officially added to the Watch List" dates. See Table A-1, Watch List Tanks, for further information.

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/lateral radiation level increases.

There were no tanks under investigation for surface or ILL decreases or for drywell/lateral radiation increases during December 1993.

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 for assumed leaks or re-leaks. Tanks/catch tanks will remain on this list until either a) completion of Interim Stabilization, or b) the updated occurrence report indicates that the tank/catch tank is not an assumed leaker.

Tank 241-BX-111. This tank was declared an assumed re-leaker on April 30, 1993. Pumping of the tank commenced on October 22, 1993. The surface level measurement was 66.75 inches on December 31, 1993. A total of 54,700 gallons was pumped by the end of December.

Resolution status: Upon completion of pumping, the surface level baseline for the tank will be adjusted. Tanks 241-BX-110 and 111 were removed from the ferrocyanide Watch List on July 9, 1993, on the basis that the tanks contain <1000 gm moles of ferrocyanide.

Saltwell pumping from BX-111 is halted upon reaching maximum allowable level in 244-BX Double Contained Receiver Tank (DCRT). The contents of the DCRT are then transferred to AN-101, and pumping is resumed in BX-111. This will be ongoing until pumping is completed for BX-111.

B. Tanks with increases indicating possible intrusions:

This section includes all single-shell 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.

Tank 241-B-202. A steady increase in the surface level measurement has been observed since December 1984. The manual tape pencil plummet is contacting liquid. When the quarterly reading was obtained on October 6, 1992, the level was recorded as 144.75 inches, thus exceeding the 2.00-inch increase criteria from the established baseline of 142.50 inches. The surface level measurement was rechecked on October 9, 1992, (145.50 inches) and October 13 (145.00 inches), verifying the increase and that the criteria had been exceeded. The surface level remained stable at 145.50 inches for December 1993. The monitoring frequency has been increased from quarterly to daily. Occurrence Report RL-WHC-TANKFARM-1993-0024 was issued February 13, 1993. This tank is Sound, Interim Stabilized, and Intrusion Prevention completed.

Resolution status: A photo package was initiated on May 11, 1993, to investigate the possibility of an intrusion. Review of previous photos was inconclusive. New photos are required to determine the actual supernatant

increase, if any. A temporary baseline was established at 145.25 inches, until the new photos are available.

Tank 241-BX-101. On September 2, 1993, the surface level increased from 10.00 to 12.00 inches. The surface level was 11.75 inches on December 31, 1993. In-tank photographs show the manual tape donut plummet contacting liquid in a shallow pool. This tank is an Assumed Leaker, Interim Stabilized, and Intrusion Prevention completed.

Resolution Status: Comparison of October 1986 photos with November 1988 photos shows evidence of an ongoing intrusion. A work package was initiated October 14, 1993, to obtain in-tank photographs which will be used to inspect the area under the plummet and investigate the possible intrusion. A site-wide in-tank photography program is being formed and photo schedules will be produced upon finalization. A finalized photo schedule is not complete, however, in-tank photos for this tank may be available by late 1995.

Tank 241-BX-103. This tank has shown an erratic increase in surface level measurements since January 6, 1986. On January 18, 1993, the surface level measurement in 103-BX exceeded the 0.50-inch increase criteria from the reference baseline of 19.50 inches, and was verified on January 20, 1993. Discrepancy Report S&DA 93-522 was issued January 21, 1993. Occurrence Report RL-WHC-TANKFARM-1993-0036 was issued March 25, 1993. The surface level measurement is currently 20.50 inches. The FIC plummet is contacting liquid as indicated by in-tank photographs taken October 31, 1986. This tank is Sound, Interim Stabilized, and Intrusion Prevention completed.

Resolution status: The current level is greater than that prior to stabilization in November 1983. The tank was previously determined to have experienced an intrusion from 1977 to March 1983 (prior to stabilization). Subsequent isolation was expected to halt the intrusion, however, the intrusion is apparently ongoing. A work package was initiated on May 11, 1993, to re-seal pits and risers and to obtain in-tank photos. The photos will be used to assess the current stabilization status of the tank. A visual survey of the area was performed to determine possible paths for precipitation to enter the tank. The weather covering on the pits and risers was found in place and undamaged. The existing grade is level and revealed no obvious draining problems. Ongoing design/isolation drawing review revealed that nozzles, floor drains and some transfer lines entering the heel pit have been left open. Photo verification of the intrusion will determine the need to provide additional isolation measures. A finalized photo schedule is not complete, however, in-tank photos for this tank may be available by late 1995.

Tank 241-BY-105. The ILL is currently at 13.31 feet. The baseline is 13.39 feet. Although the surface level and ILL are within the criteria of ± 1.1 feet, the data indicates unusual behavior trends that merit continued observation. The monitoring frequency has been increased from quarterly to weekly. The manual tape surface level measurement does not show an increase. This tank is on the ferrocyanide Watch List, an Assumed Leaker, and not yet Interim Stabilized.

Resolution Status: The surface level and ILL are displaying behavior similar to TX-113 and TX-115. The ILL is showing an increase, while the surface level measurement is showing a decrease. This phenomena could be due to either solids dissolution or formation of a depression in the solids beneath the plummet in conjunction with an intrusion. Review of previous photos indicates

the liquid volume is increasing, although it cannot be verified that the solids level is decreasing. A photo package was initiated to investigate the possibility of intrusion, or solids dissolution. A finalized photo schedule is not complete, however, in-tank photos for this tank may be available by late 1995.

Tank 241-S-102. This tank has a history of erratic increases/decreases. In-tank photographs taken March 18, 1988, show the FIC plummet contacting an uneven, dry surface. The LOW ILL was within the 0.10 foot tolerance when last scanned on December 29, 1993. Surface level measurement is 204.10 inches, which does not exceed the criteria of 3.00 inches above the baseline of 202.30 inches.

Resolution status: Photos taken in March 1988, show the surface consists of very uneven solids with scattered liquid pools. Photos taken in 1983 compared with the 1988 photos indicate the waste is shifting, possibly causing a change in surface level under the plummet. Reevaluation of the ILL using the "new method" shows an increasing trend of about 0.4 inches per year. Occurrence Report 77-191 attributed previous intrusions into the tank to drainage from the SA and SB valve pits. Because neither the tank nor the pits are interim isolated, the intrusion is likely ongoing. A photo package was initiated on May 17, 1993, to confirm the ongoing intrusion. This tank is on the hydrogen and organic salts Watch List. A safety evaluation has been issued establishing required controls in order to perform photo missions on hydrogen Watch List tanks. Either intrinsically safe camera equipment must be used, or a continuous flammable gas monitoring system must be installed.

Tank 241-S-103. The FIC was out of service from March 8 to May 14, 1993. The surface level increased from 104.15 inches on March 8 to 104.80 inches after FIC repair on May 14, 1993. On August 20, 1993, a temporary baseline of 104.80 inches was established, with a criteria of +2.00 inches. This tank has previously been on report for an increase but showed an erratic decreasing trend the latter part of November 1993. The readings ranged from 104.80 to 103.80 inches. The surface level readings were erratic during December, ranging from 104.10 to 104.40 inches. The level on December 31, 1993, was 104.40 inches. A request has been made for a reference elevation check. The LOW, last scanned December 30, 1993, is within the .08 foot tolerance. This tank is Sound, and not yet Interim Stabilized.

Resolution status: After recalibration of the FIC on June 7, 1993, the surface level (SL) remained stable at approximately 104.65 inches. Historical SL shows a general increase since 1981. The SL has continued to increase since the recent jump following FIC calibration. Normally, recalibration returns the SL to previous levels. Reevaluation of surface level data indicates a steady decrease from 104.90 on November 18, to 104.40 inches on December 31, 1993, meaning the FIC may require another calibration. Evaluation of ILL data back to 1986 using the "new method" analysis reveals an increasing trend of 0.161 inch/year which is further substantiated by a previous intrusion investigation performed in 1984. A work package will be initiated by February 15, 1994, to calibrate the FIC. The in-tank photo package will confirm the ongoing intrusion identified in 1984. A finalized photo schedule is not complete, however, in-tank photos for this tank may be available by late 1995.

Tank 241-TX-111. Although the surface level and ILL measurements do not exceed the criteria, the data indicates unusual behavior trends that merit

continued observation. This tank is Sound, Interim Stabilized, and Intrusion Prevention completed.

Resolution Status: The ILL trend was re-analyzed for this tank using the new "count rate" method. A steady, significant increase of 1.32 inch/year is evident. Surface level data is showing a decrease. Photos show a dry surface. The surface level decrease is expected to be caused by crumbling of the waste beneath the plummet. Overall, the waste level behavior of the tank is similar to that of TX-113 and 115. A photo package was initiated on October 13, 1993, to investigate the possibility of an intrusion. A finalized photo schedule is not complete, however, in-tank photos for this tank may be available by late 1995.

Tank 241-TX-113. Although the surface level and ILL measurements do not exceed the criteria, the data indicates unusual behavior trends that merit continued observation. This tank is an Assumed Leaker, Interim Stabilized, and Intrusion Prevention completed.

Resolution status: The technical evaluation of the alert condition in this tank was completed April 14, 1993. The results were inconclusive, with recommendation to accelerate the October 1997 waste characterization of the tank. This characterization is expected to confirm that solids are dissolving, causing an increase in ILL. Acceleration of waste characterization is not possible. Watch List tanks have first priority for core sampling. A photo package has been written. LOW scans and SL readings have been increased from a quarterly to a monthly frequency. A finalized photo schedule is not complete, however, in-tank photos for this tank may be available by late 1995.

Tank 241-TX-115. Although the surface level and ILL measurements do not exceed the criteria, the data indicates unusual behavior trends that merit continued observation. This tank is an Assumed Leaker, Interim Stabilized, and Intrusion Prevention completed.

Resolution status: The technical evaluation of the alert condition in this tank was completed April 14, 1993. The results were inconclusive, with recommendation to accelerate the October 1997 waste characterization. Waste characterization is expected to confirm that solids are dissolving, causing an increase in ILL. Acceleration of waste characterization is not possible for non-Watch List tanks. The 1981 photos show evidence of rain intrusion through a central pump pit riser. However, it cannot be concluded from the 1988 photos that the intrusion is ongoing. This tank will be included in the waste characterization with TX-113. LOW scans are taken weekly, and surface level readings have been increased from a quarterly to a monthly frequency. A finalized photo schedule is not complete, however, in-tank photos for this tank are may be available by late 1995.

Tank 241-TY-102. Discrepancy Report S&DA-92-489 was issued November 9, 1992, when the surface level measurement exceeded the 0.50-inch increase criteria from the established baseline of 31.40 inches. The increase criteria of 0.50 inch, considered to be an extremely tight tolerance for this tank, was revised to 1.00 inch, which is more in line with other tanks that exhibit similar erratic surface level behavior. The tank has a history of intrusions and icicle-shaped mineral buildup on the FIC plummet. The FIC plummet is contacting a shallow pool of liquid. The surface level measurement is

currently at 31.70 inches. This tank is Sound, Interim Stabilized, and Intrusion Prevention completed.

Resolution status: This tank is experiencing an ongoing intrusion as is evident by comparison of November 1984 photos with July 1987 photos and an increasing trend in surface level data. A visual survey was conducted to determine possible paths for precipitation to enter the tank. The grade around the tank is level and weather covering is on the pits and intact. The photo package, initiated May 17, 1993, will be required to assess the current stabilization status of the tank, and to assist in determining the possible paths of intrusion. Ongoing design/isolation drawing review revealed that nozzles, floor drains and some transfer lines entering the pump pit have been left open. Photo verification of the intrusion will determine the need to provide additional isolation measures. A finalized photo schedule is not complete, however, in-tank photos for this tank may be available by late 1995.

Tank 241-TY-106. Surface level readings were stable during 1990 through 1992, ranging between 13.25 to 13.50 inches. The surface level readings fluctuated between 13.50 to 15.00 inches during 1993. In-tank photographs taken August 22, 1989, show the manual tape pencil plummet contacting a dry cracked surface with discarded tapes near the plummet. The current surface level reading on December 31, 1993, was 14.25 inches. This tank is an Assumed Leaker, and Interim Stabilized, and Intrusion Prevention completed.

Resolution status: Two readings reached 15.00 inches on October 2 and October 4, 1993, which constitute a sudden increase from 14.50 inches on August 1, 1993. On October 6, 1993, the readings returned to 14.25 inches. Similar behavior occurred on October 8, 1987, when the surface level jumped to the same level then returned to allowable limits. Photos taken August 22, 1989, show a number of discarded tapes beneath the plummet. Occasional anomalous readings would be expected because of the plummet touching the discarded tapes rather than the dry waste. The monitoring frequency has been increased from quarterly to monthly in order to determine a consistent trend.

S-304 Catch Tank. The S-304 Catch Tank was put into service November 4, 1991. The surface level measurement was recorded as 1.80 inches. The level showed a steady increase until September 30, 1993, when the level was recorded as 56.80 inches. On October 1, 1993, the level decreased from 56.80 to 54.30 inches and continued to decrease to 52.89 inches by December 31, 1993. No liquid has been detected in the sump.

Resolution status. A tank leak is considered highly unlikely at this time since S-304 is located in a concrete vault containing a sump, and the sump has been verified as totally dry. It is doubtful a leak of this size (160 gallons) could bypass the sump completely.

An evaporation study will be done. Until the evaporation possibilities are fully analyzed, the baseline has been left at the peak recorded value (immediately after the July intrusion), and further level changes will be monitored by the use of "temporary" baselines. If evaporation can be confirmed, the tank will be rebaselined accordingly. The FIC has been recalibrated and found accurate, i.e., no adjustments needed.

241-E/W-151 Vent Station Catch Tank. The zip cord surface level reading exceeds the maximum operating limit of 36.00 inches. The manual tape has been out of service since July 7, 1992. A temporary zip cord was installed

December 16, 1992. The level was 45.50 inches which exceeded the active tank limit of 50% volume of 40 inches (400 gallons). Discrepancy Report S&DA-92-511 was issued December 24, 1992. Transfers are not permitted until the tank is pumped and the level is within limits. A new calibrated zip cord was installed December 16, 1993, and the surface level reading went from 71.00 to 59.00 inches. Discrepancy Report 93-655 was issued December 17, 1993. The zip cord was replaced on December 23, 1993, with a new manual tape that read 60.50 inches. The surface level reading on December 31, 1993, was 61.00 inches.

Resolution status: The catch tank was sampled and a new manual tape was installed on December 23, 1993. Two resolutions are underway:

1) Transfer catch tank waste using existing cross-site lines. Required procedure is in approval stages, USQs and required PCA to be completed by January 15, 1994. Transferring with this method could be ready by January 15, 1994.

2) Transfer catch tank waste by tanker truck. Procedure, USQs, and jumper fabrication needed to begin pumping. Should be ready by January 25, 1994.

UX-302-A Catch Tank. The surface level measurement exceeds the maximum operating limit of 50.00 inches. Discrepancy report S&DA-92-465 was issued May 12, 1992. The current surface level reading is 66.00 inches, which exceeds the 50% volume of 54 inches (8840 gallons). The FIC plummet is contacting liquid.

Resolution status: Work packages for the transfer of waste from UX-302-A and the repair of necessary instrumentation are being prepared, and the transfer of waste is being scheduled as a prestart item for the cross-site transfer. A work package has been prepared to sample/pump this catch tank. Transfer will begin after completing Vent Station transfer. Procedures are being prepared.

III. SURVEILLANCE AND WASTE TANK STATUS HIGHLIGHTS

1. Tank 241-U-107 Added to Flammable Gas (Hydrogen) Watch List

Tank 241-U-107 was considered a safety issue because of the potential for reaction between organic materials and oxidants, such as nitrite and/or nitrate, and is currently on the organic salts Watch List. As part of an overall evaluation of tank data, the Flammable Gas Tank Stabilization organization requested that an evaluation be conducted for U-107 because the surface level data indicated that the tank was experiencing slurry growth. The tank is experiencing a slow rise in surface level over a period of time. This behavior is consistent with that of the other tanks in its complex, U-103, U-105, U-108, and U-109, all of which are on the Flammable Gas Watch List. The results of the evaluation were reported and it was recommended that U-107 be added to the Flammable Gas Watch List.

An Unreviewed Safety Question (USQ) screening was completed and presented to the Plant Review Committee on December 7, 1993. As a result of this meeting, Facility Manager placed U-107 on the Flammable Gas Watch List. For further details, see Occurrence Report RL-WMC-TANKFARM-1993-0115 below.

Tank U-107 is Sound, not yet Interim Stabilized, and Partial Interim Isolated. This tank was constructed in 1943-44, with a 530,000-gallon capacity. It contains 406,000 gallons of high level radioactive waste.

2. Tank Saltwell Jet Pumping

Tank 241-BX-110 - Saltwell jet pumping began December 4, 1993, to pump contents of this tank into 244-BX Double Container Receiver Tank (DCRT). As with tank BX-111, saltwell pumping will be halted upon reaching the maximum allowable level in the DCRT. The contents of the DCRT are then transferred to tank AN-101, and pumping is resumed in BX-110. A total of 4,000 gallons was pumped from BX-110 by the end of December 1993. See Table E-5, Inventory and Status by Tank, for further information.

Tank 241-BX-111 - Saltwell jet pumping began on October 22, 1993, to pump tank BX-111 into 244-BX Double Container Receiver Tank. A total of 23,700 gallons was pumped this month, and 54,700 gallons were pumped by the end of December 1993. See Table E-5, Inventory and Status by Tank, for further information.

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 higher priority waste tank safety issues at the Hanford Site. Forty two milestones were established for accomplishing the initiatives. In FY 1993 four milestones were completed on or ahead of schedule. One milestone was completed behind schedule. In December 1993, one milestone (2r "Define tank conditions required for safe storage of ferrocyanide waste by December 1993") was completed, bringing the total for FY 1994 to three milestones completed on schedule. Two milestone completions have been missed.

4. Tank Farms Stand Down (Administrative Hold)

On August 12, 1993, non-essential work activities in the tank farms were put on administrative hold by WHC senior management until operators, supervisors and managers are retrained to perform their duties in a safe and accountable manner. Minimal essential activities required for safety, monitoring and compliance, including the daily "pump-bumping" of the SY-101 mixer pump, will continue. The administrative hold has impacted several programmatic goals for Tank Waste Remediation System (TWRS). A letter from WHC senior management has been submitted to DOE-RL addressing these programmatic delays. Further corrective actions were addressed in a Tank Waste Remediation System Tank Farm Resumption of Work Plan, dated September 13, 1993. Contained within the Work Plan is the Integrated Schedule for reinitiating individual work activities on an ongoing basis.

Testing of the SY-101 mixer pump continues to be successfully accomplished. Radioactive waste is being saltwell pumped from BX-111, with completion of the pumping scheduled for the end of January 1994. Many other tank farm work activities have now been fully resumed. In addition, reorganization is taking place to reduce management layers, and a new action plan for total upgrade is expected by February 1994.

5. Tank 241-SY-101 Mixer Pump

Phase B testing is complete. See OFF NORMAL Occurrence Report RL-WHC-TANKFARM-1993-0105 below for more information.

6. Criticality Safety Issues

On April 30, 1992, an Unreviewed Safety Question (USQ) concerning criticality safety issues in the Tank Farms was declared to be a reportable event. Unusual Occurrence report RL-WHC-TANKFARM-1992-0037 was issued. A prohibition was placed on all waste transfers into and between the tank farm facilities which is negatively affecting various Hanford programs. On September 1, 1992, the approved Justification For Continued Operations (JCO) was received. This establishes the limitations for all tanks receiving transfers and also excludes any interim stabilization of single-shell tanks until further evaluations are completed and approved by DOE-HQ. On December 15, 1992, the approved JCO was issued as WHC-SD-WM-JCO-001, "Justification for Continued Operations of Hanford High Level Waste Tanks Resulting From the Criticality USQ, 492-CRITSAS."

7. Tank Farm Sampling Schedule

The approved, baseline schedule for all tank sampling, including rotary and push-mode core sampling, vapor, grab and auger sampling for FY 1994, is included in this report. This establishes the official baseline, and any changes to this schedule must be done via change control. See Table 1 following this summary section - the sampling schedule will appear in this issue only, and will be included again when the schedule is revised.

8. Revised Heat Generation for Single-Shell Tank 241-C-106

An analysis based on a revised thermal history for Tank 241-C-106 (from 150,000 to 118,300 Btu/h) resulted in a new heat load estimate of 110,000 Btu/h ($\pm 20,000$ Btu/h) for this tank. The new heat load is based on the thermal transient behavior during the ventilation outage in 1992. The thermal analysis calculated the temperatures for the entire life of the tank, 1947 to 1992, plus a 10-year extension to the year 2002. See Table A.5 and footnotes.

9. Occurrence Reports

RL-WHC-TANKFARM-1993-0092 (OFF NORMAL) - INSTRUMENT CABLE SEVERED DURING SUBCONTRACTOR EXCAVATION RESULTS IN LOSS OF REMOTE ALARM SIGNALS FROM WEST TANK FARM FACILITIES (Final Report, 12/07/93)

On October 22, 1993, a subcontractor to Kaiser Engineers Hanford (KEH) was performing excavation work for piping installation when a Computer Automated Surveillance System (CASS) line was severed. The cable was severed by a backhoe while a trench was being dug for treated effluent transfer piping installation. This resulted in the 200 West Area tank farms being without remote alarm monitoring capabilities. Included in the cable severing was a 480 volt power line to the East-West vent station which had no impact to the facility. Electrical utility personnel were immediately dispatched to de-energize the power line. The CASS contingency plan was initiated by operations personnel in accordance with the procedure.

Previous excavation work conducted by KEH was to identify all known utilities in the area where excavation was to be conducted. However, the CASS cable and power line were not identified. Engineering drawings were provided showing CASS lines but were inaccurate as to location.

A work package was initiated to repair the severed CASS cable. Repairs have been delayed pending WHC company procurement of repair material.

Contributing to this incident was the lack of supervision provided to the offsite personnel by Kaiser Engineers Hanford (KEH). There were no KEH personnel at the job site when the cable was severed. Kaiser line management had the responsibility to ensure that the subcontractor personnel were aware of all utilities, including the physical markers that identified the power lines.

The root cause to this incident were the inadequate administrative controls in place to ensure that all known utilities are identified on the civil engineering drawings being used at the job site. KEH personnel are performing another verification of all drawings to ensure the proper location of all underground utilities.

Final evaluation: Lessons learned for all personnel is that there is a potential for underground utilities to exist within the tank farm complex. Although these utilities were properly marked, not all are as easily identified.

RL-WHC-TANKFARM-1993-0103 (OFF-NORMAL) - TANK 101-AW OUT OF LIQUID LEVEL LIMITS WHEN NEW INTERIM OPERATIONAL SAFETY LIMITS PER WHC-SD-OSR-016 IMPLEMENTED ON NOVEMBER 30, 1993, AT 0001 HOURS (10-Day Report, 12/14/93)

On November 30, 1993, Waste Tank Operations implemented section 3.1.2 of the Interim Operation Safety Requirements (IOSR) for Double-Shell Tanks (WHC-SD-OSR-0016, Rev. F). This section states the Limited Condition of Operation (LCO) limit for Primary Tank Liquid Level is ≤ 416 inches. It was previously noted that the manual tape for this tank had been giving slack tape measurements above this limit and that an occurrence report would be required upon IOSR implementation. The Food Instrument Corporation (FIC) level instrument is currently out of service. The slack tape reading on November 30 was 417.75 inches.

The LCO action statement was entered for Tank AW-101 level. All transfers into or out of this Watch List tank had previously been suspended. Action was commenced to restore tank level to within the specified limit of 416 inches (within 184 days as stated in the LCO). The work package to repair the FIC is being prepared for field work on a priority basis. When the FIC is repaired, the expected level reading should be approximately 410 inches. The steady increase in level by manual tape is consistent with crystalline growth on the tip of the plummet. After the FIC repairs are completed, a work package will be developed to remove the crystalline buildup on the manual tape using a series of flushes.

The root cause of this occurrence is Waste Tank Operations' (WTO) lack of a system to expeditiously resolve corrective maintenance issues associated with Watch List tanks. WTO is currently providing

conservative safety analysis of corrective maintenance issues associated with Watch List tanks. By using process knowledge and alternative (though less dependable) methods of measuring liquids, WFO management is confident tank AW-101 liquid levels have not exceeded operational limits.

RL-WHC-TANKFARM-1993-0105 (OFF-NORMAL) - DISCOVERY OF NEW GAS (METHANE GAS) IN WASTE TANK 241-SY-101 FOUND WHEN REVIEWING DATA FROM EVENT I AT LEVELS OF 1000 PPM (10-Day Report. 12/17/93)

On December 2, 1993, WHC Operations was notified by Los Alamos National Laboratories (LANL) that upon further review of the data from Tank SY-101 window "I" which occurred on June 26, 1993, methane gas (CH_4) was found in the amount of 1000 parts per million (ppm) in the tank vapor space. LANL also advised WHC operations that methane has 3.2 times the heating value of hydrogen (H_2). This in turn adds fuel to the burn analysis in the current safety assessment.

All mixer pump activities were halted, with the exception of the pump bump operations, until further resolution was obtained. The Technical Review Group met with LANL and concurred with the presentation from LANL to continue with mixer pump testing. DOE-RL concurred with WHC to lower the maximum level to 406 inches and continue with pump testing. The control to lower the maximum level to 406 inches was implemented on December 2, 1993. The current level of the tank is 400 inches and an auto shut-off is installed that would immediately shut off the pump if the tank level rises two inches during pump bump operations.

The lowering of the maximum level allowable for mixer pump operations from 408 to 406 inches will provide an adequate safety margin bounded within the current safety assessment. The impact of the occurrence on the environment, safety and health of workers and the public, is negligible.

RL-WHC-TANKFARM-1993-0107 (UNUSUAL OCCURRENCE) - OPERATORS ENTER 241-SY TANK FARM DURING MIXER PUMP OPERATION RESULTING IN A VIOLATION OF THE SAFETY ANALYSIS REPORT (SAR). (Notification Report. 12/06/93)

On December 4, 1993, during Phase B, Test 18 of the SY-101 mixer pump, the Operations Test Coordinator (OTC) observed operators in a restricted area (exclusion area). The OTC immediately aborted the test and made appropriate notifications.

Investigation revealed that all safety requirements were met until shift turnover. The test lasted longer than predicted and the shift manager was notified. He attempted to reach the operators but could not. The operators removed the exclusion area signs and entered the tank farm without informing the shift manager that they were planning to do so.

Root cause: The operators should not have assumed they had authority to enter the farm should have informed the shift manager that they were doing so prior to entering the SY farm. Had the operators called the shift manager and informed him they were removing the exclusion area signs, the shift manager would have been able to prevent them from doing so, and prevented the event from occurring.

Contributing cause: Communications were less than adequate. A formal pre-job brief was not held by the Test Director, Operations Test Coordinator and Shift Manager. Separate turnovers and pre-job briefs were held, and, as a result, information regarding the length of the test was not accurately related to the shift manager.

RI-WHC-TANKFARM-1993-0110 (OFF-NORMAL) - POTENTIAL REACTIVE COMPONENT DISCOVERED IN SINGLE-SHELL WASTE TANK 241-T-111 (10-Day Report, 12/17/93)

On December 1, 1993, WHC Tank Farms Plant Review Committee (PRC) reviewed a potential unreviewed safety question (USQ) relating to Tank T-111. Core samples taken in 1991 were analyzed in 1992. An uncharacterized reactive component (exotherm) was identified in the sample area. Background information indicated there are data in composite samples taken in 1974 that also show exotherms, however, the data have been questionable.

WHC Operations is treating T-111 like an organic Watch List tank, but will not declare it as a Watch List tank pending further investigation. Daily surface level measurements and weekly temperature data will be taken. Plant Engineering will review the data reports from other tanks to determine if a similar condition exists. Additional analyses on existing samples has been conducted by the Analytical Laboratories and Pacific Northwest Laboratories (PNL). Partial preliminary data were received December 17, 1993. Plant Engineering will re-verify all data to determine if there were exotherm releases from core samples.

There has been no significant impact to the facility or operations.

RI-WHC-TANKFARM-1993-0111 (OFF-NORMAL) - LIQUID LEVEL IN THE EAST/WEST VENT STATION ANNULUS SPACE EXCEEDED 80% CAPACITY, RESULTING IN AN OSD NONCONFORMANCE TO OSD-T-151-00015 (10-Day Report, 12/22/93)

On December 10, 1993, during a review of operations logs by the Shift Operations Manager, it was discovered that the East/West Vent Station catch tank liquid level was reading approximately 70 inches (700 gallons), 80% of the 800-gallon capacity of the tank, resulting in and Operations Specifications Document (OSD) nonconformance to OSD-T-151-00015.

The annulus was checked and verified to have no liquid level. Daily meetings have been scheduled to resolve the proper actions necessary to pump the tank. A work package was initiated to install a manual reel tape in the tank's enclosed housing by December 23, 1993, to determine the exact level in the tank. The manual tape reading will be compared with the previous liquid level measurements to determine the rate of level increase. A liquid sample of the tank's contents will be taken and analyzed.

RI-WHC-TANKFARM-1993-0115 (OFF-NORMAL) - 200 WEST AREA WASTE TANK 241-U-107 ADDED TO THE FLAMMABLE GAS WATCH LIST. EXHIBITS SAME BEHAVIOR AS OTHER TANKS ON WATCH LIST (Notification Report, 12/17/93)

In April 1990, the safety issue of flammable gases began to receive attention with the formal filing of an occurrence report (WHC-UOR-90-TF-

02). In response to this UOR, interim operating requirements were issued and a list of tanks that may have the potential to generate flammable gases was created. Formal notification of the process used by WMC to select the tanks was provided by letter. It was recognized that when the "Watch List" was set up, more tanks might be added to the Watch List, as additional data became available, or as additional analyses were performed.

Tank 241-U-107 was considered a safety issue because of the potential for reaction between organic material and oxidants, such as nitrite and/or nitrate, and is currently on the Organics Watch List. As part of an overall evaluation of tank data, the Flammable Gas Tank Stabilization organization requested that an evaluation be conducted for U-107 because the surface level data indicated that the tank was experiencing slurry growth. The behavior of U-107 appeared to be identical to tanks U-103, U-105, U-108, and U-109, all of which were on the Flammable Gas (Hydrogen) Watch List. The results of the evaluation were reported and it was recommended that U-107 be added to the Flammable Gas Watch List.

An Unreviewed Safety Question (USQ) screening was completed and presented to the Plant Review Committee (PRC) on December 7, 1993. As a result of this meeting, the Facility Manager placed U-107 on the Flammable Gas Watch List.

The PRC did not feel that there was sufficient information available to permit any action with respect to the USQ screening; additional information will be requested from Waste Tank Safety Programs (WTSP).

TABLE 1. FY 1994 TANK FARM SAMPLING SCHEDULE (sheet 1 of 4)

ACTIVITY ID	EARLY START	EARLY FINISH	ORIG DUR	FY93 SEP	FY94												FY95		
					OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
VS55-4	12NOV93A	16NOV93A	2																
VS46-4	14DEC93A	14DEC93A	2																
AS01-4	1FEB94	14FEB94	10																
VS36-4	2FEB94	3FEB94	2																
GS51-4	7FEB94	18FEB94	10																
GS52-4	14FEB94	18FEB94	5																
VS03-4	15FEB94	16FEB94	2																
VS65-4	16FEB94	23FEB94	5																
VS99-4	17FEB94	24FEB94	5																
GS55-4	22FEB94	28FEB94	5																
PS01-4	1MAR94	14MAR94	10																
VS47-4	1MAR94	14MAR94	10																
TC05-4	2MAR94	8MAR94	5																
GS54-4	14MAR94	18MAR94	5																
RS02-4	21MAR94	22APR94	25																
VS06-4	28MAR94	1APR94	5																
PS02-4	1APR94	14APR94	10																
AS03-4	4APR94	15APR94	10																
GS21-4	5APR94	11APR94	5																
GS02-4	6APR94	12APR94	5																
VS07-4	6APR94	12APR94	5																
GS04-4	8APR94	14APR94	5																
VS41-4	8APR94	14APR94	5																
AS02-4	11APR94	22APR94	10																
TC09-4	11APR94	15APR94	5																
GS15-4	12APR94	18APR94	5																
VS08-4	12APR94	18APR94	5																
VS13-4	29APR94	5MAY94	5																
AS05-4	2MAY94	13MAY94	10																
RS03-4	2MAY94	6JUN94	25																
PS03-4	3MAY94	16MAY94	10																
TC26-4	4MAY94	17MAY94	10																
AS08-4	6MAY94	19MAY94	10																
TC14-4	6MAY94	19MAY94	10																
AS07-4	9MAY94	20MAY94	10																
					TAKE SAMPLES SJ-4/SJ-5 Vapor C-103 IC-103 VAPOR SAMPLE INS PROBE, TAKE SAMPLES-SJ-6B ☐ SY-103 AUGER SAMPLE Samples 2 Segments 5 IC-103 VAPOR SAMPLE Using VSS Truck - SJ-6C ☐ AP-108 GRAB SAMPLE/EVAPORATOR FEED ☐ AY-102 GRAB SAMPLE IC-106 VAPOR SAMPLE (B, C) ☐ C-105 VAPOR SAMPLE (B, C) ☐ C-104 VAPOR SAMPLE (B, C) ☒ AN-107 GRAB SAMPLING ☐ C-111 PUSH MODE SAMPLING Samples 2-3 Segments2 ☐ C-103 VAPOR SAMPLE (B) ☐ BY-107 FeCN VAPOR SAMPLE & THERMOCOUPLE INS (A) ☐ S-110 GRAB SAMPLE ☐ C-106 ROTARY SAMPLING Samples 2 Segments 5 ☐ BY-104 VAPOR SAMPLE (A, B, C, HCN) ☐ SY-103 PUSH SAMPLING Samples 1 Segments 15 ☐ BX-101 AUGER SAMPLING Samples 1 Segments 1 ☐ AN-102 GRAB SAMPLING RCRA ☐ BY-105 GRAB SAMPLING ☐ BY-105 VAPOR SAMPLING (A, B, C, HCN) ☐ BY-103 GRAB SAMPLING ☐ BY-103 VAPOR SAMPLE (A) ☐ C-102 AUGER SAMPLING Sample 1 Segment 1 ☐ BY-108 FeCN VAPOR SAMPLE & THERMOCOUPLE INS (A) ☐ BY-106 GRAB SAMPLING ☐ BY-106 VAPOR SAMPLING (A, B, C, HCN) ☐ BX-104 VAPOR SAMPLE (B) ☐ B-102 AUGER SAMPLING Sample 1 Segments 1 BY-104 ROTARY MODE Samples 2 Segments 8 ☐ C-103 PUSH MODE SAMPLING Samples 2 Segments ☐ ☐ C-111 THERMOCOUPLE INSTALLATION ☐ BX-105 AUGER SAMPLING Sample 1 Segments 4 TY-104 FeCN VAPOR SAMPLE & THERMOCOUPLE INS (☐) ☐ BX-108 AUGER SAMPLING Sample 1 Segments 1														

Note: The Key to the letters in parentheses () follows this table

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TABLE 1. FY 1994 TANK FARM SAMPLING SCHEDULE (sheet 2 of 4)

ACTIVITY ID	EARLY START	EARLY FINISH	ORIG DUR	FY94												FY95				
				FY93 SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
GS05-4	12MAY94	18MAY94	5																	
GS06-4	16MAY94	20MAY94	5																	
VS17-4	23MAY94	27MAY94	5																	
VS23-4	23MAY94	27MAY94	5																	
VS81-4	25MAY94	1JUN94	5																	
TC39-4	27MAY94	10JUN94	10																	
AS04-4	1JUN94	7JUN94	5																	
RS04-4	1JUN94	7JUL94	25																	
TC15-4	2JUN94	15JUN94	10																	
TC16-4	3JUN94	16JUN94	10																	
AS09-4	6JUN94	17JUN94	10																	
VS67-4	6JUN94	10JUN94	5																	
AS10-4	7JUN94	13JUN94	5																	
VS18-4	8JUN94	14JUN94	5																	
VS20-4	9JUN94	15JUN94	5																	
TC34-4	10JUN94	23JUN94	10																	
VS66-4	10JUN94	16JUN94	5																	
VS89-4	10JUN94	16JUN94	5																	
GS10-4	15JUN94	21JUN94	5																	
PS04-4	22JUN94	7JUL94	10																	
TC32-4	29JUN94	14JUL94	10																	
GS53-4	30JUN94	8JUL94	5																	
GS07-4	1JUL94	11JUL94	5																	
TC21-4	1JUL94	18JUL94	10																	
VS52-4	1JUL94	11JUL94	5																	
VS76-4	1JUL94	11JUL94	5																	
AS06-4	6JUL94	19JUL94	10																	
TC22-4	6JUL94	19JUL94	10																	
VS12-4	15JUL94	21JUL94	5																	
GS11-4	18JUL94	22JUL94	5																	
RS01-4	18JUL94	19AUG94	25																	
GS33-4	1AUG94	5AUG94	5																	
VS35-4	1AUG94	5AUG94	5																	
TC28-4	2AUG94	15AUG94	10																	
AS11-4	3AUG94	9AUG94	5																	
				AW-104 RCRA GRAB SAMPLING ☐ AZ-102 RCRA GRAB SAMPLE ☐ AY-102 PUSH MODE CORE SAMPLING Sample 1 Segm 1 ☐ U-111 VAPOR SAMPLE (B, C) ☐ U-106 VAPOR SAMPLE (B, C) ☐ U-111 THERMOCOUPLE\VAPOR TUBE INSTALLATION ☐ AW-101 AUGER SAMPLING Sample 1 Segments 1 ☐ BY-106 ROTARY MODE Samples 2 Segments 12 ☐ TY-101 FeCN VAPOR SAMPLE & THERMOCOUPLE INS (A) ☐ TY-103 FeCN VAPOR SAMPLE & THERMOCOUPLE INS (A) ☐ TX-118 AUGER SAMPLE ☐ TX-118 VAPOR SAMPLE (A, HCN) ☐ AX-102 AUGER SAMPLING Sample 1 Segment 1 ☐ T-102 GRAB SAMPLING ☐ C-108 PUSH SAMPLING ☐ U-106 THERMOCOUPLE\VAPOR TUBE INSTALLATION ☐ U-111 VAPOR SAMPLE (B) (FOLLOWS VAPOR TUBE INS) ☐ U-106 VAPOR SAMPLE (B) (FOLLOWS VAPOR TUBE INS) ☐ T-104 GRAB SAMPLE ☐ C-108 VAPOR SAMPLE (B) ☐ BX-111 THERMOCOUPLE INSTALLATION ☐ T-112 GRAB SAMPLE ☐ T-107 GRAB SAMPLING ☐ T-107 FeCN VAPOR SAMPLE & THERMOCOUPLE INS (A) ☐ BY-111 VAPOR SAMPLE (HCN) ☐ C-109 VAPOR SAMPLING (A, B) ☐ AX-104 AUGER SAMPLING Sample 1 Segments 1 ☐ T-101 THERMOCOUPLE INSTALLATION ☐ C-111 VAPOR SAMPLING (B) ☐ T-111 GRAB SAMPLE ☐ BY-105 ROTARY MODE Samples 2 Segments 1 ☐ BX-106 GRAB SAMPLE ☐ C-112 VAPOR SAMPLE (A, B) ☐ BX-110 THERMOCOUPLE INSTALLATION ☐ A-104 AUGER SAMPLING Sample 1 Segment 1 ☐																

Plot Date	26JUN94	Activity Start/Stop Dates	07/07
Start Date	06JUN94	Activity Start/Stop Dates	07/07
Project Start	06JUN94	Activity Start/Stop Dates	07/07
Project Finish	06JUN94	Activity Start/Stop Dates	07/07

WMC TANK FARM SAMPLING SCHEDULE FY 1994 SAMPLING SCHEDULE			
Date: 8 of 8			
D:\msj\			

Print Date: 25JUN94
Data Date: 10JUN94
Project Start: 1JUN94
Project Finish: 05JUN94

Activity: Tank Farm Sampling
Priority: High
Status: In Progress

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WMC
TANK FARM SAMPLING SCHEDULE
FY 1994 SAMPLING SCHEDULE

0.000000 Scheduler 2-3090 for D. Hamilton 3-2099

Task	Revision	Checked	Approved

Note: The Key to the letters in parentheses () follows this table

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Note: The Key to the letters in parentheses () follows this table

TABLE 1. TANK FARM SAMPLING SCHEDULE (sheet 3 of 4)

KEY

A - Ferrocyanide Watch List Flammability and Health Hazards Vapor Sampling (1 day duration)

This type of sampling is required prior to intrusive work in any of the ferrocyanide Watch List tanks. The requirements are explicitly provided by a safety assessment. It involves a check of the flammability of the headspace using a CGM, and a check of the organic vapor concentration using a OVM, at 3 different elevations within the tank. It also currently requires that certain hazardous compounds be sampled for, including hydrazine (H_2N_2), ammonia (NH_3), hydrogen cyanide (HCN), and nitrogen oxides (NO_x). These hazardous compounds are measured at each of the 3 levels, using Dräger tubes.

B - Heated-Tube Vapor Sampling by the Tank Vapor Issue Resolution Program (1 day duration)

The Vapor Program has developed the vapor sampling system (VSS) to collect representative vapor samples from the tanks. This system uses a heated sampling probe, heated sample transfer lines, and a heated manifold to eliminate the condensation of vapors. This type of sampling is to be performed to resolve health and safety issues. Each sampling event will be designed to obtain a minimum amount of data on a set of analytes, and to address questions unique to each tank. Currently all ferrocyanide and organic salts Watch List tanks are to be sampled by this method.

C - Exhauster Air Permit Vapor Sampling to support exhauster use during Rotary Mode Core Drilling (1 day duration)

Use of an exhauster that pulls air from the waste tanks will be part of the rotary mode core drilling operations. To obtain an air permit from the state to operate the exhauster, WMC has agreed to sample and analyze the vapors in the tank prior to operating the exhauster. To date, no tank has been sampled for this reason. The initial tanks to be rotary mode core drilled will be sampled by the Tank Vapor Issue Resolution Program, using the heated probes and manifold of the Vapor Sampling System. Sampling and analysis will target all gases and vapors normally of interest to the Tank Vapor Issue Resolution Program. Methods for future vapor characterization to support exhauster use have not been identified.

D - Special Vapor Sampling to address special issues (duration unknown at this time)

Flammability check of tank 103-C. The flammability of the tank 103-C headspace cannot be measured by the same means as other tanks, since a fog of organic liquid droplets may exist in the tank. The chosen method of determining the headspace flammability will involve sampling the semivolatile organic vapor and aerosol. After samples have been collected there is an anticipated 3 week delay for sample analysis.

HCN - Hydrogen Cyanide Sampling - Impinger method (1 day duration)

NOTE: All activities will require 1 day duration for prep work and 1 day for clean up.

Also, all organic tanks listed above will have the flammability taken at the breather filter which is different from the method performed on FeCN tanks. Since the time to perform the flammability check takes less than 20 minutes, the duration to perform the flammability for any watchlist tanks has been absorbed into the duration for that activity.

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APPENDIX A

WASTE TANK SURVEILLANCE MONITORING TABLES

WIC-CP-0182-69

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TABLE A-1. WATCH LIST TANKS (Sheet 1 of 2)

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 as the Priority 1 Hanford Site Tank Farm Safety Issues: "Issues/situations that contain most necessary conditions that could lead to worker (onsite) or offsite radiation exposure through an uncontrolled release of fission products, e.g., Tank SY-101."

December 31, 1993

<u>Single-Shell Tanks</u>			Officially	<u>Single-Shell Tanks</u>			Officially	<u>Single-Shell Tanks</u>			Officially
Tank No.	Category		Added to Watch List	Tank No.	Category		Added to Watch List	Tank No.	Category		Added to Watch List
A-101 (2)	Hydrogen		1/91	S-102 (2)	Hydrogen,		1/91	TY-101 (2)	Ferrocyanide		1/91
AX-101 (2)	Hydrogen		1/91	(2)	Organic Salts		1/91	TY-103 (2)	Ferrocyanide		1/91
AX-103 (2)	Hydrogen		1/91	S-111 (2)	Hydrogen		1/91	TY-104 (2)	Ferrocyanide		1/91
B-103 (2)	Organic Salts		1/91	S-112 (2)	Hydrogen		1/91	U-103 (2)	Hydrogen		1/91
BX-102 (2)	Ferrocyanide		1/91	SX-101 (1)(2)	Hydrogen		1/91	U-105 (2)	Hydrogen		1/91
BX-106 (2)	Ferrocyanide		1/91	SX-102 (1)(2)	Hydrogen		1/91	U-106 (2)	Organic Salts		1/91
BY-103 (2)	Ferrocyanide		1/91	SX-103 (1)(2)	Hydrogen		1/91	U-107 (2)	Organic Salts		1/91
BY-104 (2)	Ferrocyanide		1/91	SX-104 (1)(2)	Hydrogen		1/91	(6)	Hydrogen		12/93
BY-105 (2)	Ferrocyanide		1/91	SX-105 (1)(2)	Hydrogen		1/91	U-108 (2)	Hydrogen		1/91
BY-106 (2)	Ferrocyanide		1/91	SX-106 (1)(2)	Hydrogen,		1/91	U-109 (2)	Hydrogen		1/91
BY-107 (2)	Ferrocyanide		1/91	(1)(2)	Organic Salts		1/91	U-111 (7)	Organic Salts		8/93
BY-108 (2)	Ferrocyanide		1/91	SX-109 (1)(2)	Hydrogen because other tanks vent thru it		1/91				
BY-110 (2)	Ferrocyanide		1/91	T-107 (3)	Ferrocyanide		2/91	<u>Double-Shell Tanks</u>			Officially
BY-111 (2)	Ferrocyanide		1/91	T-110 (2)	Hydrogen		1/91	Tank No.	Category		Added to Watch List
BY-112 (2)	Ferrocyanide		1/91	TX-105 (2)	Organic Salts		1/91	AN-103 (1)(2)	Hydrogen		1/91
C-103 (2)(4)	Organic Salts		1/91	TX-118 (2)	Ferrocyanide,		1/91	AN-104 (1)(2)	Hydrogen		1/91
C-106 (2)	High Heat Load		1/91	(2)	Organic Salts		1/91	AN-105 (1)(2)	Hydrogen		1/91
C-108 (2)	Ferrocyanide		1/91					AW-101 (1)(5)	Hydrogen		6/93
C-109 (2)	Ferrocyanide		1/91					SY-101 (1)(2)	Hydrogen		1/91
C-111 (2)	Ferrocyanide		1/91					SY-103 (1)(2)	Hydrogen		1/91
C-112 (2)	Ferrocyanide		1/91								

Four tanks (S-102, SX-106, TX-118, U-107) are on more than one Watch List
See footnotes next page

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TABLE A-1 WATCH LIST TANKS (Sheet 2 of 2)

Footnotes:

- (1) These eight single-shell tanks and the six double-shell tanks on the Watch List are actively ventilated.

Although on various dates beginning in March 1990, WHC identified tanks containing ferrocyanide, organic salts, etc., which were then added to this report as Watch List tanks, the following official notifications were made to DOE-RL:

- (2) Letter 9059124, H. D. Harmon, WHC, to R. E. Gerton, DOE-RL, "Safety Measures for Waste Tanks at Hanford Site, Richland, Washington," dated January 8, 1991, identified 23 ferrocyanide tanks, 23 tanks with potential for accumulation of flammable gas, eight organic tanks, and one high heat load tank, as being Watch List tanks. (52 tanks)

The ferrocyanide and hydrogen tanks were declared Unresolved Safety Questions (USQ); the organic tanks and the high heat load tank were within the safety envelope as defined by the safety analysis reports and were not designated as USQs.

- (3) Letter 9059124.1 (revision to 9059124 above), dated February 8, 1991, added T-107 to the Ferrocyanide Watch List. (53 tanks)

- (4) Tank C-103 was declared a USQ per Unusual Occurrence Report RL-WHC-TANKFARM-1992-0069, issued September 1992, because of an organic layer covering the surface. This tank was previously identified as a Watch List tank in footnote (2) above.

- (5) Letter 9354700, J. C. Fulton, WHC, to R. E. Gerton, DOE-RL, "Addition of Tank 241-AW-101 to Flammable Gas Watch List," dated June 3, 1993, added this double-shell tank to the Watch List. (54 tanks)

- (6) Letter 9353957, J. C. Fulton, WHC, to R. E. Gerton, DOE-RL, "Single-Shell Waste Tank 241-U-111," dated May 24, 1993, recommended this tank be included on the Organic Tanks Watch List. This tank was added to the Watch List on August 31, 1993.

- (7) Tank U-107 was declared a USQ per Occurrence Report RL-WHC-TANKFARM-1993-0115, issued December 1993, because of an increase in slurry growth. This tank is also on the Organics Watch List.

Notes: BX-110, BX-111, BY-101 and T-101 were removed from the Ferrocyanide Watch List in July 1993, per letter 93-CAB-223, John H. Anttonen, DOE-RL, to T. M. Anderson, WHC, "Resolution of Unreviewed Safety Question for Four Ferrocyanide Tanks," dated July 9, 1993.

TABLE A-2. TANKS CONTAINING >1000 GRAM MOLE OF FERROCYANIDE (Watch List Tanks) (Sheet 1 of 2)

These tanks have been declared an Unreviewed Safety Question (USQ) because their explosion potential exceeds previously reported safety analysis consequences (1).

Temperatures in these tanks did not exceed the maximum temperature criteria or surveillance frequency limits for December 1993.

All Watch List tanks are reviewed for increasing temperature trends. Tanks connected to TMACS are required to be monitored continuously; those not connected are required to be monitored weekly. Temperatures are taken in the waste unless indicated otherwise.

A-5

Tank No.		Highest Temperature Reading in Waste (F.)	Date of Reading	Readings Taken by TMACS (5)	Total Waste (Inches) (6)	FeCN (2) (x1000 g mol)	Estimated Heat Load (3) (Btu/h) (kW)	Date Declared Assumed Leaker	Interim Stabilized Date	
BX-102		67	12/06/93	No	24	<1	<10000	<2.93	1971	1/78
BX-108		67	12/06/93	No	24	<1	<10000	<2.93	Sound	N/A
BY-104	Floor 1	126	12/20/93	Yes	155	83	8000	1.61	Sound	1/85
BY-105	Floor 10C	113	12/20/93	Yes	190	38	4000	0.97	1984	N/A
BY-106	Floor 1	129	12/26/93	Yes	241	70	5500	0.97	1984	N/A
BY-108		110	12/13/93	Yes	90	58	4400	6.74	1972	2/85
BY-110	Floor 10A	109	12/26/93	Yes	152	71	4000	7.39	Sound	1/85
BY-111	Floor 14	88	12/26/93	Yes	174	8	2400	10.02	Sound	1/85
BY-112	Floor 5	90	12/26/93	Yes	113	2	<10000	<2.93	Sound	5/85
C-108	Floor 1	85	12/27/93	No	31	25	10000	<2.93	Sound	3/84
C-109	Floor 3	78	12/21/93	No	31	30	3500	1.11	Sound	11/83
C-112	Floor 1	83	12/06/93	No	45	31	<10000	<2.93	Sound	9/90
T-107		71	12/06/93	No	73	5	<10000	<2.93	1984	N/A
TY-101		68	12/21/93	No	50	23	<10000	<2.93	1973	8/83
TY-104		68	12/21/93	No	24	12	<10000	<2.93	1981	1/83

Legend: TMACS = Tank Monitor & Control System

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Note: Tanks BX-110, BX-111, BY-101 and T-101 were removed from this Watch List in July 1993, per letter 93-CAB-223, John H. Anttonen, DOE-FIL, to T. M. Anderson, WHC, "Resolution of Unreviewed Safety Question for Four Ferrocyanide Tanks," dated July 9, 1993.

FOOTNOTES: See next page

TABLE A-2. TANKS CONTAINING >1000 GRAM MOLE OF FERROCYNANIDE (Watch List Tanks) (Sheet 2 of 2)

FOOTNOTES:

- A-6
- (1) This Priority 1 Waste Tank Safety Issue is stated as follows: "Could the concentrations and distribution of ferrocyanide and nitrate/nitrite in the tanks lead to an explosion if allowed to heat up or if an uncontrolled exothermic reaction could occur?"
 - (2) The amount of FeCN reported in the tanks is based on WHC-SD-WM-ER-133-REV 0, "An Assessment of the Inventories of the FeCN Watch List Tanks," (Table 3-7), October 1991.
 - (3) The estimated heat generation rates are from the following: WHC-EP-0474-4, "Quarterly Report on Defense Nuclear Facilities Safety Board Recommendation 90-7 for the Period Ending March 31, 1992," Table 1-A, dated January 1992. Tank 104-BY only estimated per WHC-EP-0669, "Ferrocyanide Safety Program: Updated Thermal Analysis Model for Ferrocyanide Tanks with Application to Tank 241-BY-104," December 1993. WHC-EP-0638, "Ferrocyanide Safety Program: Heat Load and Thermal Characteristics Determination for Selected Tanks," November 1993, analyzed six tanks, BY-105, 106, 108, 110, and 111, and C-109.
 - (4) This tank also contains a high concentration (>3% wt TOC) of organic salts.
 - (5) This column indicates which tanks are being monitored by the Tank Monitor & Control System (TMACS); automatic temperature readings are taken continuously. Temperatures in tanks connected to TMACS but temporarily not being monitored by TMACS are taken manually. Tanks TX-118, Y-101, TY-103, and TY-104 are being taken manually in December because of a TMACS connection malfunction.
 - (6) Total waste in Kgal taken from Table E-5, Inventory and Status by Tanks for SSTs. Kgal/inches calculations for the temperature tables are as follows: (waste in inches is an approximation only for these temperature tables)

$$\frac{\text{Kgal waste} - 12.5 \text{ Kgal waste}^*}{2.75 \text{ Kgal/inch}} + 12 \text{ inches}^*$$

* The bottom 12 inches in dish bottom tanks contain 12.5 Kgal. All tanks are calculated as dish bottom tanks for the temperature tables, although A and AX farms have flat bottoms. Inches are from centerline tank bottom.

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TABLE A-3. TANKS WITH POTENTIAL FOR HYDROGEN OR FLAMMABLE GAS ACCUMULATION ABOVE THE FLAMMABILITY LIMIT (Watch List Tanks)

These tanks have an Unreviewed Safety Question (USQ) because of the potential consequences of a radiological release resulting from a flammable gas burn, an event not analyzed in the SST Safety Analysis Report.

Temperatures in these tanks did not exceed the applicable maximum temperature criteria or surveillance frequency limits for the month of December 1993. All Watch List tanks are reviewed for increasing temperature trends. Temperatures are taken in the waste unless indicated otherwise.

Tank No.	Highest Temperature Reading (F.) in Waste	Date of Reading	Total Waste (3) (Inches)	Monitoring Frequency	Assumed Leaked Date	Interim Stabilized Date
A-101	154	12/27/83	54	Weekly	SOUND	N/A
AX-103	115	12/27/83	48	Weekly	SOUND	8/87
S-111	83	12/14/83	224	Weekly	SOUND	N/A
SX-101 (5)	139	12/31/83	173	Weekly	SOUND	N/A
SX-103	177	12/25/83	245	Weekly	SOUND	N/A
SX-105	182	12/28/83	253	Weekly	SOUND	N/A
SX-106 (1) Floor 2	146	12/24/83	98	Weekly	1985	5/81
SX-106 (1) Floor 3	83	12/25/83	145	Weekly	SOUND	N/A
U-105	80	12/27/83	159	Weekly	SOUND	N/A
U-106	87	12/27/83	178	Weekly	SOUND	N/A
AN-103	117	12/13/83		Weekly	SOUND	N/A
AN-105	118	12/20/83		Weekly	SOUND	N/A
SY-101	119	12/08/83		Daily	SOUND	N/A
SY-103	90	12/20/83		Weekly	SOUND	N/A
201-1003						N/A = Not Applicable

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

(2) Tanks S-102, SX-106, and U-107 are also on the Organics Watch List.

(3) See footnote (6) in Table A-2 (Ferrocyanide Tanks) for Total Waste/Inches calculations. Waste in inches is an approximation for temperature tables only.

(4) Tank AW-101 was added to this list per letter 8354700, J. C. Fulton, WMC, To R. E. Gerton, DOE-RL, "Addition of Tank 241-AW-101 to Flammable Gas Watch List," dated June 3, 1993.

(5) Tank U-107 was added to this list per Unusual Occurrence Report RL-WMC-TANGAFPM-0115, issued December 1993, because of an increase in slurry growth.

**TABLE A-4. SINGLE-SHELL TANKS CONTAINING CONCENTRATIONS OF ORGANIC SALTS
>3 WEIGHT % TOTAL ORGANIC CARBON (TOC) (Watch List Tanks) (Sheet 1 of 2)**

These tanks have organic chemicals which are potentially flammable and mixtures of organic materials mixed with nitrate and nitrate salts can deflagrate. They are listed here because of their "potential for release of high level waste because of uncontrolled increases in the temperature or pressure." Double-Shell tanks have >3 Weight % TOC and are not on the Watch List because they contain mostly liquid and there is no credible organic safety concern for tanks which contain mostly liquid. The safety concern is with tanks that primarily contain solids because they could dry out and heat up, and "high organic concentrations in the tanks could support an exothermic reaction at elevated temperatures (350 degrees F/180 degrees C)." These tanks (with the exception of C-103), do not have an associated USQ because the presence of organic material was reviewed in the SST Safety Analysis Report.

Temperatures in these tanks did not exceed the applicable maximum temperature criteria or surveillance frequency limits for the month of December 1993. These tanks are monitored weekly. All Watch List tanks are reviewed for increasing temperature trends.

Temperatures are taken in the waste unless indicated otherwise.

Tank No.	Temperature Reading (F.) In waste	Date of Reading	Total Waste Inches (4)	Assumed Leaked Date	Interim Stabilized Date	Source of Waste (11)	Organic Content (wt. %) (6)	NaNO 3 and NaNO 2 (wt. %)(9)	TOC (WT.%) (7)	Waste Surface Potentially Dry (8)	Last Date Sampled
B-103	65	12/06/93	29	1978	2/85	First and second cycle waste from B Plant and in-tank solidification (ITS-1 & ITS-2) evaporator bottoms	11.4 (9)	60.5 (9)	3.3	x	9/75
C-103 (3)	121	12/27/93	78	SOUND	N/A	PUREX and insoluble strontium-rich sludging solids from the operation of 244-CR Vault	-	-	-		9/90
S-102 (1)	108	12/27/93	207	SOUND	N/A	REDOX	21.0 (10)	41.0 (10)	6.1	x	2/80
SX-106 (1)	114	12/24/93	203	SOUND	N/A	Salt waste and first cycle condensate from REDOX, and 242-S Evaporator bottoms	14.6 (9)	60.9 (9)	4.3		8/79
TX-105	102	12/20/93	228	1977	9/83	) Tributyl phosphate (TBP)	12.8 (9)	52.7 (9)	3.7	x	1/81
TX-118 (2)	77	12/21/93	134	SOUND	4/83	) process waste and 242-T	20.2 (10)	50.4 (10)	5.9	x	9/81
U-106	82	12/13/93	90	SOUND	N/A	) Evaporator bottoms	46.6 (10)	52.4 (10)	13.6		6/77
U-107 (1)	78	12/27/93	155	SOUND	N/A	)	14.7 (9)	75.4 (9)	4.3		12/74
U-111 (5)	81	12/13/93	127	SOUND	N/A	Concentrated B Plant Waste	48.2 (10)	---(10)	14.1	x	7/93

See Footnotes next page

**TABLE A-4. SINGLE-SHELL TANKS CONTAINING CONCENTRATIONS OF ORGANIC SALTS
>3 WEIGHT % TOTAL ORGANIC CARBON (TOC) (Sheet 2 of 2)**

Footnotes:

- (1) These tanks also have the potential for hydrogen or flammable gas accumulation.
- (2) Tank TX-118 also contains ferrocyanide.
- (3) Tank C-103 was declared a USQ because of an organic layer covering the surface, reference Unusual Occurrence Report RL-WHC-TANKFARM-1992-0069, issued September 1992.
- (4) See footnote (6) in Table A-2 (Ferrocyanide Temperature Table) for Total Waste/inches calculations. Waste inches calculations are approximations only for temperature tables.
- (5) Tank U-111 was added August 31, 1993. See August 1993 Summary Highlights for information and Table A-1. "Watch List Tanks" for applicable reference.
- (6) WHC, 1990, "The Kyshtym Explosion and Explosion Hazards with Nitrate-Nitrite Bearing Wastes with Acetates and Other Organic Salts," WHC-SD-LB-033, Westinghouse Hanford Company, Richland, Washington
- (7) Dry wt. % basis. Calculated as wt. % sodium acetate equivalent X.2926.
- (8) Due to absence of supernatant liquid.
- (9) Calculated from data developed by Track Radioactive Components (TRAC) computer code, 1984.
- (10) "Removal of Radionuclides from Hanford Defense Waste Solutions," RH0-SA-51, 1980, Rockwell Hanford Operations, Richland, Washington. All or part of liquid from which composition data were derived may have been transferred to double-shell tanks.
- (11) WHC, 1993, "Action Plan for Responses to Abnormal Conditions in Hanford Site Radioactive Waste Tanks with High Organic Content," WHC-EP-0461, Rev. 1, Westinghouse Hanford, Richland, Washington.

TABLE A-5. SINGLE-SHELL TANKS WITH HIGH HEAT LOADS (>40,000 Btu/h)(Sheet 1 of 2)

High heat load tanks have temperature surveillance requirements established by SD-WM-SAR-006 REV 1, "SST Isolation Safety Analysis Report," dated January 1986, and OSD-T-151-00013 REV D-O, "Operating Specifications for Single-Shell Waste Storage Tanks," dated August 1990. While all of these tanks are considered high heat load tanks per SAR definition, only one (241-C-108) is on the High Heat Watch List.

Temperatures in these tanks did not exceed SAR or OSD requirement limits for the month of December 1993. All high heat load tanks are on active ventilation unless indicated otherwise in the footnotes. These high heat tanks are reviewed for increasing temperature trends.

Temperatures are taken in the waste unless indicated otherwise.

Tank No.	Location (6)	Temperature Reading (F.)		Date of Reading	Total Waste Inches (7)	Monitoring Frequency (Btu/h)	Estimated Heat Load (1) (kW)	Date	
		In Waste	Reading					Declared Assumed Leaker	Interim Stabilized Date
A-104 (4)	R-12	194	12/30/93	18	Weekly	50000	15	1975	9/78
A-105 (3)	R-16	141	12/30/93		Weekly	10000	5	1963	7/79
C-106 (5/3)	Riser 14	159	12/06/93	91	Weekly	110000	32	SOUND	N/A
C-106 (2/3)	Riser 14	134	12/06/93		Weekly	110000	32	SOUND	N/A
SX-107	Tree 8	175	12/22/93	45	Monthly	42000	12	1964	10/79
SX-108 (9)	Tree 8	176	12/22/93		Monthly	42000	12	1962	8/79
SX-108	Tree 8	203	12/10/93	49	Monthly	45000	13	1962	8/79
SX-109 (5)	Tree 8	149	12/27/93	98	Weekly	50000	15	1965	5/61
SX-109 (3)	Tree 8	153	12/27/93		Weekly	50000	15	1965	5/61
SX-110	Tree 8	173	12/31/93	30	Monthly	42000	12	1976	8/79
SX-111	Tree 8	196	12/31/93		Monthly	42000	12	1974	7/79
SX-111	Tree 8	168	12/30/93	53	Monthly	44000	13	1974	7/79
SX-112	Tree 8	156	12/30/93		Monthly	43000	13	1969	7/79
SX-112	Tree 8	163	12/30/93	41	Monthly	43000	13	1969	7/79
SX-114	Tree 8	191	12/28/93	73	Monthly	58000	17	1972	7/79
SX-114	Tree 8	189	12/28/93		Monthly	58000	17	1972	7/79
10 Tanks									
A-105 laterals (5)		247	12/27/93		Weekly				

Temperatures are taken in 34 thermocouples located in the laterals beneath A-105. SAR requirements (see top of table) do not apply to these temperatures; however, Westinghouse Hanford has voluntarily chosen to apply the waste temperature limits to the soil temperature for surveillance reporting.

Footnotes - see next page

TABLE A-5. SINGLE-SHELL TANKS WITH HIGH HEAT LOADS (>40,000 Btu/h)(Sheet 2 of 2)

Footnotes:

(1) High heat loads as of 1988, evaluation completed April 20, 1989 (kW = 3412 Btu/h). The predominant heat load for these tanks is from CS 137 (half life of 30 years) and SR 90 (half life of 28.1 years). Tank C-105 was re-evaluated in WHC-SD-WM-ER-178, "Thermal Analysis of Tank 241-C-105 in Support of Process Test," January 1993. Engineering Change Notice #196834, June 24, 1993, changed the status of C-105 from High Heat Load to Normal, effective July 1, 1993. Tank C-106 was re-evaluated using a revised thermal history based on the thermal transient behavior during the ventilation outage in 1992. WHC-SD-WM-ER-200 "Revised Thermal History of Tank 241-C-106," issued December 20, 1993, documents the new heat load estimate of 110,000 Btu/h (+/- 20,000 Btu/h) for this tank.

(2) Periodic water additions are required in C-106 to maintain evaporative cooling and thus prevent overheating. This tank is scheduled for partial retrieval starting in 1997, at which time cooling water additions will be discontinued. Temperatures in Riser 8 are consistent at mid-150 degrees, however, temperatures in riser 14 vary between approximately 120 and 135, also consistently.

(3) Watch List Tanks: C-106 is on the Watch List because "without water additions (in the event of a leak) the tank could exceed structural temperature limits resulting in unacceptable structural damage." SX-109 is on the hydrogen Watch List because it has the potential for flammable gas accumulation due to other SX tanks venting through it.

(4) A-104/105/106 exhaustor has been out of service from October 1, 1991, until August 20, 1992, when it was briefly restarted. Problems exist which must be resolved before the exhaustor is operational. Temperatures in A-104 and A-105 are monitored weekly.

(5) Maximum lateral temperatures under A-105 increased 20 degrees F. by January 1992, but then dropped a few degrees and have remained fairly stable at current temperature. These temperatures are monitored weekly.

(6) Tanks A-104 and A-105

Two temperature probes are installed in risers in A-104, and six are installed in risers in A-105. These are individual probes. In A-104, the probes are in contact with the sludge; in A-105, they are in contact with the bottom of the tank (A-105 has a bulged bottom).

Tank C-106

Tank C-106 has six functioning thermocouples (#1 through 6) on riser 8, and 12 functioning thermocouples on riser 14.

Tanks SX-107, 108, 109, 110, 111, 112, and 114

Each of these tanks has eight thermocouple trees, with eight thermocouples on each tree, with the exception of SX-108, which has four operational thermocouples on each of two trees. Tree #2 and Tree #8 are monitored in each of these SX tanks.

(7) Calculations for Total Waste Inches: see footnote (6), Table A-2 (Ferrocyanide Tanks). Waste in inches is an approximation only for temperature tables.

(8) There are 19 single-shell tanks with active ventilation (eight are on the Watch List as indicated by an asterisk):

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

(9) Thermocouple #1 is usually reported on at approximately 195 degrees, however, this thermocouple was erratic during December 1993, therefore thermocouple #2 was used in this report.

TABLE A-6. NON-WATCH LIST LOW HEAT LOAD TANKS (<40,000 Btu/h)
(Page 1 of 3)

Temperatures are taken semiannually in January and July, unless otherwise indicated, in the following 96 single-shell tanks. Legend follows table.

	Tank No.	Highest Temperatures taken in waste		Total Waste (1)		Comments
		Jan. 93	Jul. 93	Kgal	Inches	
1	A-102	92	92	41	15	
2	A-103	117	117	370	135	
3	A-106	138	137	125	50	
4	AX-102	O/S	76	39	10	Only TC#5 working on 7/93, reading in vapor space Control box contaminated inside
5	AX-104	97	98	7	3	
6	B-101	110	108	113	48	
7	B-102	62	63	32	19	TC#1 O/S, reading in vapor space
8	B-104	68	66	371	142	
9	B-105	68	66	306	50	
10	B-106	61	62	117	67	TC#1 & 2 O/S
11	B-107	62	62	165	41	TC#1 thru 3 O/S, reading in vapor space
12	B-108	62	62	94	54	
13	B-109	62	61	127	97	
14	B-110	O/S	68	246	94	TC#1 thru 4 O/S. Reading in vapor space
15	B-111	O/S	86	237	19	TC#1 & 2 O/S, work order issued, historical readings erratic
16	B-112	62	63	33	7	
17	B-201	58	60	29	151	
18	B-202	59	61	27	141	
19	B-203	62	62	51	263	
20	B-204	59	62	50	258	
21	BX-101	O/S	O/S	43	27	All TCs O/S, work order issued, last reading 74 F. in 11/92
22	BX-103	O/S	O/S	66	31	All TCs O/S, last reading 77 F. in 10/92
23	BX-104	O/S	O/S	99	43	(2) No TC tree per Riser Configuration document Last reading 87 F. in 10/80
24	BX-105	66	63	51	26	
25	BX-107	O/S	O/S	345	133	All TCs O/S, work order issued, last reading 69 F. in 10/82
26	BX-108	O/S	63	26	17	No relay box in 1/93
27	BX-109	O/S	77	193	78	No relay box in 1/93, no historical readings available
28	BX-110	-	68	199	80	Readings taken weekly, tank being pumped
29	BX-111	-	65	230	91	Readings taken weekly, tank being pumped
30	BX-112	O/S	62	165	67	No relay box in 1/93
31	BY-101	-	75	387	148	Continuous readings taken on TMACS
32	BY-102	O/S	O/S	341	131	(2) No TC tree per Riser Configuration document. Last reading 72 F. in 4/79
33	BY-109	O/S	O/S	423	161	(2) No TC tree per Riser Configuration document.

TABLE A-6. NON-WATCH LIST LOW HEAT LOAD TANKS (<40,000 Btu/h)
(Page 2 of 3)

Temperatures are taken semiannually in January and July, unless otherwise indicated, in the following 96 single-shell tanks. Legend follows table.

	Tank No.	Highest Temperatures taken in waste		Total Waste (1)		Comments
		Jan. 93	Jul. 93	Kgal	Inches	
34	C-101	91	88	88	39	
35	C-102	O/S	O/S	423	161	Broken coupling, work order issued, last reading 96 F. in 11/92
36	C-104	88	87	295	115	TC#1 thru 5 O/S, reading in vapor space
37	C-105	-	92	150	63	Monitored weekly, formerly on High Heat Load list
38	C-107	-	125	275	107	Monthly reading requirement per procedure, monitored weekly
39	C-110	65	65	187	75	TC#1 thru 4 O/S, reading in vapor space
40	C-201	60	61	2	13	
41	C-202	58	61	1	8	
42	C-203	58	60	5	29	
43	C-204	O/S	O/S	3	18	No hookup to tree, last reading prior to '91.
44	S-101	O/S	115	427	162	TC#1, 3, 5, & 6 O/S, work order issued
45	S-103	88	85	248	98	
46	S-104	108	104	294	114	
47	S-105	77	73	456	173	
48	S-106	81	78	543	205	
49	S-107	106	107	368	129	
50	S-108	87	85	604	227	
51	S-109	83	O/S	568	214	All TCs O/S
52	S-110	117	116	390	149	
53	SX-113	75	73	26	15	
54	SX-115	O/S	O/S	12	10	(2) No TC junction box, last reading prior 12/91
55	T-101	-	66	102	45	Formerly on ferrocyanide Watch List
56	T-102	O/S	O/S	32	19	(2) No TC tree per Riser Configuration document, last reading 68 F. in 2/81
57	T-103	58	59	27	17	
58	T-104	62	O/S	445	169	All TCs O/S, work order issued
59	T-105	O/S	O/S	98	43	(2) No TC tree per Riser Configuration document
60	T-106	58	59	21	15	
61	T-108	O/S	O/S	180	73	All TCs O/S, TC tree laying on ground, J-3 issued 1/92 and again 7/93, last reading 63 F. in 11/91
62	T-109	O/S	O/S	58	29	All TCs O/S, work order issued, last reading 75 F. in 2/91
63	T-111	62	59	458	174	TCs #1, 2, 5, 6 O/S
64	T-112	62	58	67	32	
65	T-201	61	59	29	150	
66	T-202	61	58	21	110	
67	T-203	61	75	35	182	
68	T-204	62	60	38	197	

TABLE A-6. NON-WATCH LIST LOW HEAT LOAD TANKS (<40,000 Btu/h)
(Page 3 of 3)

Temperatures are taken semiannually in January and July, unless otherwise indicated, in the following 96 single-shell tanks. Legend follows table.

Tank No.	Highest Temperatures taken in waste		Total Waste (1)		Comments
	Jan. 93	Jul. 93	Kgal	Inches	
69	TX-101	O/S	O/S	87 39	(2) No TC tree per Riser Configuration document
70	TX-102	O/S	O/S	113 49	Cable cut from tree
71	TX-103	71	55	157 54	Cable cut from tree, readings taken by Instrument Technician
72	TX-104	64	60	65 31	Cable cut from tree, readings taken by Instrument Technician
73	TX-106	80	59	453 172	Cable cut from tree, readings taken by Instrument Technician
74	TX-107	67	60	36 21	Cable cut from tree, readings taken by Instrument Technician
75	TX-108	65	61	134 56	Cable cut from tree, readings taken by Instrument Technician
76	TX-109	97	64	384 147	Cable cut from tree, readings taken by Instrument Technician
77	TX-110	81	O/S	462 175	Cable cut from tree, readings taken by Instrument Technician
78	TX-111	73	61	370 142	Cable cut from tree, readings taken by Instrument Technician
79	TX-112	72	72	649 243	Cable cut from tree, readings taken by Instrument Technician
80	TX-113	73	65	607 228	Dial pushed inside housing, readings taken by Instr. Tech.
81	TX-114	O/S	O/S	535 202	Cable cut from TC tree
82	TX-115	70	67	640 240	Dial pushed inside housing, readings taken by Instr. Tech.
83	TX-116	O/S	O/S	631 237	(2) Tree cut off in riser per Riser Configuration document
84	TX-117	O/S	O/S	626 235	All TCs O/S, cable cut from tree
85	TY-102	O/S	O/S	64 31	No selector switch, last reading 64 F. in 12/91
86	TY-105	75	77	231 91	
87	TY-106	60	60	17 14	
88	U-101	66	61	25 17	
89	U-102	88	81	374 143	
90	U-104	O/S	O/S	122 52	(2) No TC tree per Riser Configuration document
91	U-110	81	72	186 75	
92	U-112	62	61	49 25	
93	U-201	O/S	O/S	5 29	All TCs O/S, work order written, last reading 66 F. in 11/92
94	U-202	60	59	5 29	
95	U-203	59	O/S	3 18	
96	U-204	O/S	80	3 18	Selector knob not working 1/93, 7/93 readings suspect

(1) See Table A-2 (footnote 6) for waste gallons/inches calculations.

(2) Thermocouples in nine tanks (BX-104, BY-102, BY-109, SX-115, T-102, T-105, TX-101, TX-116, and U-104) are out of service due to no TC trees in these tanks, or the thermocouples have been cut off, covered over, or are otherwise unable to function, per the Riser Configuration document. (Also see comment section above)

LEGEND:	
TC - Thermocouple	
TMACS - Tank Monitor & Control System	
O/S - Out of service	
Riser Configuration document - WHC-SD-RE-TI-053, REV 8, "Riser Configuration Document for Single-Shell Tanks," September 1991	
SUMMARY:	
Readings obtained in July 1993	<u>Tanks</u> 71
No readings (TC trees O/S - includes nine tanks with no trees - see footnote above)	<u>25</u>
Total low heat load tanks	96 (U-111 was added to Organics Watch List, August 1993)

TABLE A-7. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS

149 TANKS (Sheet 1 of 5)

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. (5)

All Dome Elevation Survey monitoring is in compliance.

All Drywell monitoring is in compliance.

Psychrometrics (2)

In-tank Photographs (3)

Pressure Monitoring (6)

CAM/RAMP Monitoring (7)

Vapor Monitoring (8)

LEGEND:

= in compliance with all applicable documentation
O/C	= out of compliance with documentation
-357	= WMC-SD-WM-TI-357, "Waste Storage Tank Status and Leak Detection Criteria"
POP	= Plant Operation Procedure TO-040-830, "Obtain/Record SST Temperatures"
M.T.	= Manual Tape
FIC	= Food Instrument Corporation
OSR/SAR	= Operations Safety Requirements/Safety Analysis Report, SD-WM-SAR-008, Rev 2, 2/86; -SAR-034, Rev 0, 8/81
OSD	= Operating Specifications Doc., OSD-T-151-00013, Rev D-0, 8/80
N/A	= Not applicable (i.e., no LOW, M.T., FIC installed)
O/S	= Out of Service
Neutron	= LOW readings taken by Neutron probe

Information as of 12/31/93

Tank Number	Category		Temperature Readings (5)(6)	Surface Level Readings (1) (-357)		LOW Readings (-357) (9) Neutron	Radiation Readings		Dome Elevation Surveys (OSR/SAR)
	Watch List(6)	High Heat		M.T.	FIC		Lateral Readings (-357)	Drywell Readings (OSR/SAR)	
A-101	X			N/A	N/A		O/C		
A-102				N/A		N/A	O/C		
A-103				N/A		N/A	O/C		
A-104		X			N/A	N/A	O/C		
A-105		X			N/A	N/A			
A-106				N/A		N/A			
AX-101	X			N/A		N/A			
AX-102					N/A	N/A			
AX-103	X			N/A		N/A			
AX-104					N/A	N/A			
B-101				N/A		N/A			
B-102				N/A		N/A			
B-103	X			N/A		N/A			
B-104					N/A				
B-105					N/A				
B-106				N/A		N/A			
B-107					N/A	N/A			
B-108				N/A		N/A			
B-109					N/A	N/A			
B-110					N/A	N/A			
B-111				N/A		N/A			
B-112				N/A		N/A			
B-201					N/A	N/A			
B-202					N/A	N/A			
B-203					N/A	N/A			
B-204					N/A	N/A			
BX-101			O/C		N/A	N/A			
BX-102	X				N/A	N/A			
BX-103			O/C	N/A		N/A			
BX-104			O/S-O/C	N/A		N/A			
BX-105				N/A		N/A			
BX-106	X			N/A		N/A			
BX-107			O/C	N/A		N/A			

TABLE A-7. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS
149 TANKS (Sheet 2 of 5)

Information as of 12/31/93

Tank Number	Category		Temperature Readings (5)(6)	Surface Level Readings (1) (-357)		LOW Readings (-357) (9) Neutron	Radiation Readings		Dome Elevation Surveys (OSR/SAR)
	Watch List(6)	High Heat		M.T.	FIC		Lateral Readings (-357)	Drywell Readings (OSR/SAR)	
BX-108					N/A	N/A	N/A		
BX-109					N/A	N/A	N/A		
BX-110 (4)					N/A	N/A	N/A		
BX-111 (4)					N/A	N/A	N/A		
BX-112					N/A	N/A	N/A		
BY-101 (4)				O/C	N/A	N/A	N/A		
BY-102			O/S-O/C		N/A	N/A	N/A		
BY-103	X				N/A	N/A	N/A		
BY-104	X				N/A	N/A	N/A		
BY-105	X				N/A	N/A	N/A		
BY-106	X				N/A	N/A	N/A		
BY-107	X				N/A	N/A	N/A		
BY-108	X				N/A	N/A	N/A		
BY-109			O/S-O/C		N/A	N/A	N/A		
BY-110	X				N/A	N/A	N/A		
BY-111	X				N/A	N/A	N/A		
BY-112	X				N/A	O/C	N/A		
C-101					N/A	N/A	N/A		
C-102			O/C		N/A	N/A	N/A	N/A	
C-103	X				N/A	N/A	N/A		
C-104					N/A	N/A	N/A		
C-105					N/A	N/A	N/A		
C-106 (4)	X	X			N/A	N/A	N/A		
C-107					N/A	N/A	N/A		
C-108	X			O/C (10)	N/A	N/A	N/A		
C-109	X				N/A	N/A	N/A		
C-110					N/A	N/A	N/A		
C-111	X				N/A	N/A	N/A		
C-112	X				N/A	N/A	N/A		
C-201					N/A	N/A	N/A		
C-202					N/A	N/A	N/A		
C-203					N/A	N/A	N/A		
C-204			O/C		N/A	N/A	N/A		
S-101					N/A	N/A	N/A		
S-102	X				N/A	N/A	N/A		
S-103					N/A	N/A	N/A		
S-104					N/A	N/A	N/A		
S-105					N/A	N/A	N/A		
S-106					N/A	N/A	N/A		
S-107					N/A	N/A	N/A		
S-108					N/A	N/A	N/A		
S-109			O/C		N/A	N/A	N/A		
S-110					N/A	N/A	N/A		
S-111	X				N/A	N/A	N/A		
S-112	X				N/A	N/A	N/A		
SX-101	X				N/A	N/A	N/A		
SX-102	X				N/A	N/A	N/A		
SX-103	X				N/A	N/A	N/A		
SX-104	X				N/A	O/S-O/C	N/A		
SX-105	X				N/A		O/C		
SX-106	X				N/A		N/A		
SX-107		X			N/A	N/A	O/C		
SX-108		X			N/A	N/A	O/C		

TABLE A-7. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS
149 TANKS (Sheet 3 of 5)

Information as of 12/31/93

Information as of 12/31/93

Tank Number	Category		Temperature Readings (5)(6)	Surface Level Readings (1) (-357)		LOW Readings (-357) (9) Neutron	Radiation Readings		Dome Elevation Surveys (OSR/SAR)
	Watch List(6)	High Heat		M.T.	FIC		Lateral Readings (-357)	Drywell Readings (OSR/SAR)	
SX-109 (4)	X	X			N/A	N/A	O/C		
SX-110		X			N/A	N/A	O/C		
SX-111		X			N/A	N/A	O/C		
SX-112		X			N/A	N/A	O/C		
SX-113					N/A	N/A	N/A		
SX-114		X			N/A	N/A	O/C		
SX-115			O/S - O/C		N/A	N/A	O/C		
T-101 (4)						N/A	N/A		
T-102			O/S - O/C	N/A	O/C	N/A	N/A		
T-103				N/A		N/A	N/A		
T-104			O/C		N/A		N/A		
T-105			O/S - O/C	N/A		N/A	N/A		
T-106				N/A		N/A	N/A		
T-107	X			N/A		N/A	N/A		
T-108			O/C			N/A	N/A		
T-109			O/C	N/A		N/A	N/A		
T-110	X			N/A		N/A	N/A		
T-111				N/A		N/A	N/A		
T-112				N/A		N/A	N/A		
T-201					N/A	N/A	N/A		
T-202					N/A	N/A	N/A		
T-203					N/A	N/A	N/A		
T-204					N/A	N/A	N/A		
TX-101			O/S - O/C	N/A	O/C	N/A	N/A		
TX-102			O/C		N/A		N/A		
TX-103				N/A		N/A	N/A		
TX-104				N/A		N/A	N/A		
TX-105	X				N/A	O/S-O/C	N/A		
TX-106					N/A		N/A		
TX-107				N/A		N/A	N/A		
TX-108				N/A			N/A		
TX-109				N/A			N/A		
TX-110			O/C		N/A		N/A		
TX-111					N/A		N/A		
TX-112					N/A		N/A		
TX-113					N/A		N/A		
TX-114			O/C		N/A		N/A		
TX-115					N/A		N/A		
TX-116			O/S O/C		N/A	N/A	N/A		
TX-117			O/C		N/A		N/A		
TX-118	X			N/A			N/A		
TY-101	X			N/A		N/A	N/A		
TY-102			O/C	N/A		N/A	N/A		
TY-103	X			N/A			N/A		
TY-104	X			N/A		N/A	N/A		
TY-105					N/A	N/A	N/A		
TY-106					N/A	N/A	N/A		
U-101				O/C	N/A	N/A	N/A		
U-102				N/A			N/A		
U-103	X			N/A			N/A		
U-104			O/S - O/C		N/A	N/A	N/A		
U-105	X			N/A			N/A		
U-106	X			N/A			N/A		

TABLE A-7. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS
149 TANKS (Sheet 4 of 5)

Information as of 12/31/83

Tank Number	Category		Temperature Readings (5)(6)	Surface Level Readings (1) (-357)		LOW Readings (-357) (9) Neutron	Radiation Readings		Dome Elevation Surveys (OSR/SAR)
	Watch List(6)	High Heat		M.T.	FIC		Lateral Readings (-357)	Drywell Readings (OSR/SAR)	
U-107	X			N/A	O/C		N/A		
U-108	X			N/A			N/A		
U-109	X			N/A			N/A		
U-110				N/A			N/A		
U-111	X			N/A			N/A		
U-112									
U-201			O/C						
U-202									
U-203			O/C						
U-204					N/A	N/A	N/A		
Catch Tanks and Special Surveillance Facilities									
A-302-A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A-302-B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
311-ER	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
182-AX	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
181-AZ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
184-AZ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BX-TK/SMP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A-TK/SMP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
204-AR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
417-A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vent Sta.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S-302	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S-302-A	N/A	N/A	N/A	N/A	O/C	N/A	N/A	N/A	N/A
S-304	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TX-302-B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TX-302-C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
U-301-B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UX-302-A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
141-S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
142-S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Totals: 149 tanks	45 Watch List Tanks (4)	10 High Heat Tanks (4)	O/C: 25 tanks – (semiannual monitoring frequency) (5)	O/C: 4 tanks 0 catch tank	O/C: 3 tanks 1 catch tank	O/C: 3 tanks 58 tanks have LOWs (2 are O/C)	O/C: 13 tanks	0	0

See Footnotes on next page

TABLE A-7. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS
149 TANKS (Sheet 5 of 5)

Footnotes:

1. All SSTs have either manual tape or FIC, with the exception of S-108 and T-101, which have both. Tank 101-T also has a zip cord. All SST FICs are connected to CASS, with the exception of SX-106; however, the connection for many tanks is broken. For such cases, manual readings are taken. Manual surface level readings include readings taken by manual tape, manual FIC (not connected to CASS; SX-106), manual readings of automatic FIC (if CASS is printing "0"), or automatic FIC. In some cases, the surface level readings are taken using a zip cord. While less accurate, such readings are acceptable for meeting the surface level reading requirements.
2. High heat tanks have active exhausters; psychrometrics are taken in these tanks (A-104/105, C-105/106 [effective July 1, 1993, C-105 is no longer a high heat load tank], SX-107, 108, 109, 110, 111, 112, and 114). The exhausters on A-104/105 have been down since October 1991; no readings are being taken. Psychrometric readings have not been taken in the SX high heat load tanks since July 1993. The frequency of psychrometric readings in SSTs is determined by the Cognizant Engineers for the applicable tank farms on an "as needed" basis, with the exception of tanks C-105/106. Hanford Federal Facility Agreement and Consent Order, Washington State Department of Ecology, U. S. Environmental Protection Agency, and U. S. Department of Energy, 1992 (Tri-Party Agreement) requires psychrometric readings to be taken in C-105/106 on a monthly frequency. Last readings were taken October 27, 1993; readings were not taken in November. A Discrepancy Report was issued. Readings were not taken in December.
3. In-tank photographs are requested on an "as needed" basis. No in-tank photographs were taken between September 1990 and March 1993.
4. Two tanks are on both category lists (C-106 and SX-109). In July 1993, C-105 was removed from the High Heat Load list and SX-110, SX-111, SY-101 and T-101 were removed from the ferrocyanide Watch List. Only C-105 continues to be taken weekly; the other tanks are now taken semiannually. U-111 was added to the Organic Salts list August 31, 1993.
5. Temperature readings may be regulated by OSD, -357, or POP. Additionally, high heat load tanks are regulated by OSR/SAR. Thermocouples in the nine tanks designated O/S-O/C are out of service; there are either no thermocouple trees in these tanks, or trees have been cut off, covered over, or are otherwise unable to function. The OSD does not require readings or repair of out-of service thermocouples for the 96 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. Temperatures were taken in July 1993; a total of 25 tanks are O/C because either no attempt to obtain the temperature was made, or a reading could not be obtained.
6. "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, (the "Wyden Amendment") requires continuous pressure monitoring and temperature monitoring in Watch List tanks. WMC-EP-0422 REV 1, "A Plan to Implement Remediation of Waste Tank Safety Issues at the Hanford Site," December 1991, addresses these monitoring issues. WMC-EP-0600, "Status Report on Resolution of Waste Tank Safety Issues at the Hanford Site," issued August 1993, describes the resolution strategy for these safety issues.
7. Continuous Air Monitoring (CAM) compliance and Radiation Area Monitoring Panel (RAMP) compliance are not addressed in this table.
8. Double-shell tank farm SY has the only tanks with continuous vapor/flamable gas monitoring; not addressed in this table.
9. An Engineering Change Notice was issued November 1993, changing the monitoring frequency of LOW readings by Gamma probe to be taken "by request only." The Gamma probe column has therefore been deleted.
10. Surface level measurement monitoring is out of compliance in C-108 because the manual tape was removed to install a thermocouple tree. This tank does not have an FIC. A work package is pending to re-install the manual tape.

**TABLE A-8. DOUBLE-SHELL TANKS MONITORING COMPLIANCE STATUS
28 TANKS (Sheet 1 of 2)**

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 (2)
In-tank Photographs (3)
Pressure Monitoring (6)
CAM/RAMP Monitoring (7)
Vapor Monitoring (8)

LEGEND:	
■	= In compliance with all applicable documentation
O/C	= Out of compliance with documentation
-357	= WHO-SD-WM-TI-357, "Waste Storage Tank Status and Leak Detection Criteria"
M.T.	= Manual Tape
PIC	= Food Instrument Company
OSR/SAR	= Operations Safety Requirements/Safety Analysis Report WHO-SD-WM-SAR-016, Rev 1, 5/88 WHO-SD-HS-SAR-010, Rev 1, 8/83 (Aging Waste)
OSD	= Operations Safety Doc., OSD-T-181-0007, Rev H-S, 1/82
N/A	= Not Applicable (i.e., no M.T., PIC installed)
O/S	= Out of Service
W.F.	= Weight Factor
Rad.	= Radiation

Information as of 12/31/93

Tank Number	Watch List	Temperature Readings (4) (OSD)	Surface Level Readings (1) (-357, OSR/SAR)		Radiation Readings		
					Leak Detection Pits (5) (-357, OSR/SAR)		Annulus (-357)
			M.T.	FC	W.F.	Rad.	
AN-101						O/C	
AN-102						O/C	
AN-103	X						
AN-104	X					O/C	
AN-105	X					O/C	
AN-106						O/C	
AN-107							
AP-101						O/C	
AP-102				O/S		O/C	
AP-103						O/C	
AP-104			O/S			O/C	
AP-105						O/C	
AP-106						O/C	
AP-107				O/S		O/C	
AP-108						O/C	
AW-101	X			O/S			
AW-102							
AW-103						O/C	
AW-104						O/C	
AW-105						O/C	
AW-106						O/C	
AY-101				O/S			O/C
AY-102						O/C	O/C
AZ-101				O/S		O/C (8)	
AZ-102				O/S			
BY-101	X						
BY-102							
BY-103	X						
Totals: 28 tanks	8 Watch List Tanks	O/C: 0	O/C: 0	O/C: 0	O/C: 0	O/C: 19 tanks	O/C: 2 tanks

See footnotes next page:

TABLE A-8. DOUBLE-SHELL TANKS MONITORING COMPLIANCE STATUS
28 TANKS (Sheet 2 of 2)

Footnotes:

1. All DSTs have both manual tape and FIC, with the exception of the AN Tank Farm which has only FICs. The manual tape is used when the FIC is out of service. O/C will be shown when no readings are obtained.
2. Psychrometric readings are only taken on tanks with active exhausters; all DSTs have active exhausters. The frequency of psychrometric readings in DSTs is determined by the Cognizant Engineers for the applicable tank farms on an "as needed" basis. Currently, monthly readings are being taken on the SY-101 annulus exhaust, SY-102 tank and annulus exhaust, and SY-103 tank and annulus exhaust. SY-101 tank exhaust readings are not being taken until a port on the tank exhaust header becomes available for exhauster readings. No other psychrometric readings are currently being taken monthly.
3. In-tank photographs are requested on an "as needed" basis. Last in-tank photographs in DSTs were taken in April 1989.
4. OSD specifies DST temperature limits, gradients, etc. Tank SY-101 temperatures are obtained shiftwise with increased readings taken prior to and following gas venting.
5. Failure of both leak detection systems requires repair of at least one system within 5 working days. Failure of one system only, repair must be within 10 workdays per -357 document. If the pair of out-of-service system exceeds these timeframes, all systems are O/C. Out-of-service systems which have not exceeded these timeframes will be shown as O/S.
6. "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, (the "Wyden Amendment") requires continuous pressure monitoring and temperature monitoring in Watch List tanks. WMC-EP-0422 REV 1, "A Plan to Implement Remediation of Waste Tank Safety Issues at the Hanford Site," December 1991, addresses these monitoring issues. A status report on resolution of Waste Tank Safety Issues at the Hanford Site has been prepared but has not yet been cleared for public release.
7. Continuous Air Monitoring (CAM) compliance and Radiation Area Monitoring Panel (RAMP) compliance are not addressed in this table.
8. Double-shell tank farm SY has the only tanks with continuous vapor/flammable gas monitoring; not addressed in this table.
9. Although data are being received for AZ-101, this information is considered questionable.

TABLE A-9. AUTOMATIC FOOD INSTRUMENT CORPORATION (FIC) GAUGES OUT OF SERVICE

December 31, 1993

Date of Last Automatic		Reading Status		Comments		Required Monitoring Frequency(-357)	
Tank No.	SST/DST FIC Reading	Reading Status		Comments		Required Monitoring Frequency(-357)	
T-102	SST 09/06/93	No reading taken since 09/07/93		Out of compliance as of 09/07/93		Daily	
TX-101	SST 10/28/93	No reading taken since 10/28/93		Out of compliance as of 10/28/93		Daily	
U-107	SST 11/27/93	No reading since 11/27/93		Out of compliance as of 11/28/93		Daily	
C-Farm	-	Taking manual FIC readings		In compliance		Daily/Quarterly	
C-105	SST 06/09/93	Taking manual FIC readings		In compliance		Daily	
SY-101	DST 08/23/91	Taking manual FIC readings		In compliance		Daily	
SY-102	DST 08/25/93	Taking manual FIC readings		In compliance		Daily	
SY-103	DST 12/05/93	Taking manual FIC readings		In compliance		Daily	
U-105	SST 11/17/92	Taking manual FIC readings		In compliance		Daily	
AP-102	DST 01/27/93	Taking manual tape readings		In compliance		Daily	
AP-107	DST 12/21/93	Taking manual tape readings		In compliance		Daily	
AW-101	DST 10/23/92	Taking manual tape readings		In compliance		Daily	
AY-101	DST 08/31/90	Taking manual tape readings		In compliance		Daily	
AZ-101	DST 02/02/90	Taking manual tape readings		In compliance		Daily	
AZ-102	DST 02/15/90	Taking manual tape readings		In compliance		Daily	
Check Tanks							
A-302-A	04/16/91	Taking manual reading		In compliance		Daily	
151-AZ	07/29/93	Taking Manual FIC reading		In compliance		SST	
S-302-A	10/04/93	No reading taken since 10/04/93		Out of compliance as of 10/11/93		Weekly	
Frequency reading requirements: Daily - Must be taken by 2 pm each day Weekly - Must be taken by 2 pm each Monday Quarterly - Must be taken by 2 pm on the seventh day of each quarter							
SST - Single-Sensor Tank DST - Double-Sensor Tank -357 - WFOC-SD-100-11-007, Waste Storage Tank Status and Leak Detection Criteria

Figure 1. Discrepancy Report Status

Figure 2. Discrepancy Report Cumulative Total

Figure 3. Discrepancy Report Status by Age

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APPENDIX B

**DOUBLE SHELL TANK WASTE TYPE
AND SPACE ALLOCATION**

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**TABLE B-1. DOUBLE-SHELL TANK WASTE TYPE AND SPACE ALLOCATION
DECEMBER 1993**

DOUBLE-SHELL TANK INVENTORY BY WASTE TYPE		SPACE DESIGNATED FOR SPECIFIC USE	
Complexant Concentrate (102-AN, 107-AN, 101-AY, 101-SY, 103-SY)	13,100 Kgal	Spare Tanks (3) (1 Aging & 1 Non-Aging Waste Tank)	12,100 Kgal
Concentrate Phosphate (102-AP, 106-AN)	11,000 Kgal	Segregated Tank Space (105-AP, 101-AY, 102-AN, 107-AN, 103-AW)	11,400 Kgal
Double-Shell Slurry and Slurry Feed (103-AN, 104-AN, 105-AN, 105-AP, 101-AW)	11,000 Kgal	Watch List Tank Space (103-AN, 104-AN, 105-AN, 101-SY, 103-SY, 101-AW)	11,000 Kgal
Neutralized Current Acid Waste (101-AZ, 102-AZ)	12,100 Kgal	Priority Tank Space (2) (101-AN, 102-AW, 106-AW, 102-SY)	12,100 Kgal
Dilute Waste (1) (101-AN, 101-AP, 103-AP, 106-AP, 107-AP, 108-AP, 102-AW, 103-AW, 104-AW, 105-AW, 106-AW, 101-AY, 102-AY, 101-AZ, 102-AZ, 102-SY, 102-AP, 104-AP)	11,000 Kgal	Miscellaneous Head Space	11,000 Kgal
NCR and PFP Settled Solids (103-AW, 105-AW, 102-SY)	11,000 Kgal	TOTAL DOUBLE-SHELL TANK SPACE	
		24 Tanks at 1140 Kgal	27,360 Kgal
		4 Tanks at 980 Kgal	3,920 Kgal
			31,280 Kgal

(1) Easily reduced in volume by Evaporator/LERF

(2) Reduced by Saltwell Liquid pumping, Mini Run and PFP Operations

(3) 241-101-AY: A minimum liquid level is set to provide extra protection against any bottom uplifting of the tank's steel liner. WHC-SD-WM-TI-357, "Waste Storage Tank Status and Leak Detection Criteria," specifies 64 in. as the minimum surface level measurement when the annulus system is in operation, and 18 in. if the annulus ventilation system is shut down. See also OSD-T-151-0007, "Unclassified Operation Specifications for the 241 AN, 241AP, 241AW, 241AY and 241SY Tank Farms." Because of space availability, waste is stored in 102-AY, the aging waste spare tank. In case of a leak, the contents of 102-AY will be distributed to any other DST(s) having available space.

Note: Net change in DSTs since last month: 91 Kgal.

WVPIUT

WHC-EP-0182-69

WHC-EP-0182-69

Note: Graphic does not Depict Waste Receipts or Depletions to Specific Use Tank Space

FIGURE B-1. CURRENT STATUS AND CONTINGENCY SPACE FOR THE 242-A EVAPORATOR RESTART

NOTE: THIS GRAPHIC DEPICTS "USABLE SPACE" DEPLETION AND NOT THE TOTAL RECEIPTS TO DSTs.

WVPFACIL

FIGURE B-2. TOTAL AVAILABLE USABLE TANK SPACE

100 K GALLONS

FIGURE B-3. PRIORITY SPACE AVAILABILITY AND USAGE

FIGURE B-5. PUREX MONTHLY WASTE GENERATIONS

FIGURE B-6. TANK FARM MONTHLY WASTE GENERATIONS

FIGURE B-7. B PLANT MONTHLY WASTE GENERATIONS

K GALLONS

MHC-EP-0182-69

BYPTPL

FIGURE B--8. T PLANT MONTHLY WASTE GENERATIONS

FIGURE B-9. S PLANT MONTHLY WASTE GENERATIONS

FIGURE B-10. 300 AREA MONTHLY WASTE GENERATIONS

Table B-2. Double Shell Tank Waste Inventory for December 31, 1993

(page 1 of 2)

TANKS	INVENTORY	SOLIDS	TYPE	LEFT
101AW=	1138	84	DSSF	2
102AW=	966	3	DN	174
103AW=	647	487	PD/DN	493
104AW=	1123	267	DN	17
105AW=	1044	388	PD/DN	96
106AW=	1082	211	DN	58
101AY=	891	83	DC	89
102AY=	944	32	DN	36
101AZ=	931	35	NCAW	49
102AZ=	974	95	NCAW	6
101AN=	700	0	DN	440
102AN=	1095	89	CC	45
103AN=	953	373	DSS	187
104AN=	1058	264	DSSF	82
105AN=	1131	0	DSSF	9
106AN=	21	17	CP	1119
107AN=	1066	134	CC	74
101SY=	1102	560	CC	38
102SY=	723	133	PT/DN	417
103SY=	758	4	CC	382
101AP=	1060	0	DN	80
102AP=	1104	0	CP	36
103AP=	1131	0	DN	9
104AP=	18	0	DN	1122
105AP=	821	0	DSSF	319
106AP=	1128	0	DN	12
107AP=	1108	0	DN	32
108AP=	899	0	DN	241
TOTAL=	25525			

SEGREGATED SPACE	
* 101AW=	2
103AW=	493
102AP=	36
105AP=	319
* 101SY=	38
* 103SY=	382
101AY=	89
102AN=	45
* 103AN=	187
* 104AN=	82
* 105AN=	9
107AN=	74

WATCHLIST TANKS

PRIORITY SPACE	
102SY=	417
101AN=	440
102AW=	174
106AW=	58

MISC. HEADSPACE

101AP=	80
103AP=	9
106AP=	12
107AP=	32
104AW=	17
101AZ=	49
102AZ=	6

USABLE SPACE	
104AP=	1122
108AP=	241
105AW=	96
102AY=	36
106AN=	1119
TOTAL=	2614
SP/RES	-2280
USABLE	334

TOTAL SPACE AVAILABLE	
NON-AGING	27360
AGING =	3920

TOTAL INVENTORY	
11/93 TOTAL	25525
12/93 TOTAL	25616

USEABLE SPACE	
11/93 TOTAL	347
12/93 TOTAL	334

PRIORITY SPACE	
11/93 TOTAL	1145
12/93 TOTAL	1089

Inventory Calculation by Waste Type:

COMPLEXED CONCENTRATE (CC)		
102AN=	1095	(CC)
107AN=	1066	(CC)
101SY=	1102	(CC & DSS)
103SY=	758	(CC, DSS & SWL)
101AY=	891	(DC)
TOTAL=	5912	

NCRW		
103AW=	180	SOLIDS= 487
105AW=	656	SOLIDS= 388
TOTAL=	836	TOTAL= 875

WEST AREA WASTE (DN/PD)		
102SY=	590	SOLIDS= 133
TOTAL=	590	TOTAL= 133

CONC. PHOSPHATE (CP)		
106AN=	21	
102AP=	1104	
TOTAL=	1125	

DILUTE WASTE (DN)	
101AP=	1060
103AP=	1131
106AP=	1128
107AP=	1108
108AP=	899
101AN=	700
102AW=	966
104AW=	1123
106AW=	1082
102AY=	944
104AP=	18
TOTAL=	12245

NCAW (AGING WASTE (@ 5M Na))	
101AZ=	791
102AZ=	434
TOTAL=	1225

DSS/DSSF	
105AP=	821
103AN=	953
104AN=	1058
105AN=	1131
101AW=	1138
TOTAL=	5101

GRAND TOTALS	
CC=	4021
DC=	891
NCRW=	875
CP=	1125
NCAW=	1225
DSS/DSS	5101
PFP=	133
DILUTE=	12245
TOTAL=	25616

NOTE: All Values are in Kilogallons.

Table B-2. Double Shell Tank Waste Inventory for December 31, 1993 (page 2 of 2)

TOTAL AVAILABLE SPACE AS OF DECEMBER 31, 1993:			
SEGREGATED TANK SPACE:			
(*) Watch List Tanks	TANK	WASTE TYPE	AVAILABLE SPACE
	* 101-AW	DSSF	2 KGALS
	103-AW	NCRW	493 KGALS
	102-AP	CP	36 KGALS
	105-AP	DSSF	319 KGALS
	* 101-SY	CC/DSS	38 KGALS
	* 103-SY	CC/DSS	362 KGALS
	101-AY	DC	89 KGALS
	102-AN	CC	45 KGALS
	* 103-AN	DSS	187 KGALS
	* 104-AN	DSSF	82 KGALS
	* 105-AN	DSSF	9 KGALS
	107-AN	CC	74 KGALS
AVAILABLE TANK SPACE=			5884 KGALS
MINUS SEGREGATED SPACE=			-1756 KGALS
PRIORITY TANK SPACE:			
SWL/PPF NON-COMPLEXED SWL RECEIVER EVAPORATOR START-UP EVAPORATOR START-UP	TANK	WASTE TYPE	AVAILABLE SPACE
	102-SY	DN	417 KGALS
	101-AN	DN	440 KGALS
	102-AW	DN	174 KGALS
	106-AW	DN	58 KGALS
AVAILABLE SPACE AFTER SEGREGATION=			3908 KGALS
MINUS PRIORITY SPACE=			-1089 KGALS
MISCELLANEOUS HEADSPACE:			
	TANK	WASTE TYPE	AVAILABLE SPACE
	101-AP	DN	80 KGALS
	103-AP	DN	9 KGALS
	106-AP	DN	12 KGALS
	107-AP	DN	32 KGALS
	104-AW	DN	17 KGALS
	101-AZ	AW	49 KGALS
	102-AZ	AW	6 KGALS
AVAILABLE SPACE AFTER PRIORITY=			2819 KGALS
MINUS MISCELLANEOUS HEADSPACE=			-205 KGALS
REALISTIC USABLE TANK SPACE:			
	TANK	WASTE TYPE	AVAILABLE SPACE
	104-AP	DN	1122 KGALS
	106-AP	DN	241 KGALS
	105-AW	DN	98 KGALS
	102-AY	NCRW	36 KGALS
	106-AN	CP	1119 KGALS
TOTAL AVAILABLE SPACE AFTER UNUSABLE DEPLETION=			2614 KGALS
MINUS SPARE TANK SPACE=			-2280 KGALS

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APPENDIX C

TANK AND EQUIPMENT CODE AND STATUS DEFINITIONS

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C. TANK AND EQUIPMENT CODE/STATUS DEFINITIONS
December 31, 1993

1. TANK STATUS CODES

WASTE TYPE

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
GRTFD	Grout Feed Tank
SRCVR	Slurry Receiver Tank

2. SOLID AND LIQUID VOLUME DETERMINATION METHODS

F	Food Instrument Company (FIC) Automatic Surface Level Gauge
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 <i>National Defense Authorization Act for Fiscal Year 1991</i> , November 5, 1990, Public Law 101-510, (also known as the Wyden Amendment).

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 (of 6.5 molar hydroxide) 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 liquors not identified as complexed.
PUREX Decladding (PD/PN)	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.

Supernate	The liquid above the solids in waste storage tanks.
Ferrocyanide	A compound of iron and cyanide commonly expressed as FeCN. The actual formula for the ferrocyanide anion is $[\text{Fe}(\text{CN})_6]^{-4}$.

WASTE STATUS

In-Service Tank	The waste classification of a tank being used, or planned for use, for the storage of liquid (in excess of a minimum supernatant liquid heel) in conjunction with production and/or waste processing.
Out-of-Service Tank	A tank which does not meet the definition of an in-service tank. Before September 1988, these tanks were defined as inactive in this report. [Note: All single-shell tanks (SST) are out of service.]

STABILIZATION (Single-Shell Tanks only)

Interim Stabilized (IS)	A tank which contains less than 50,000 gal of drainable interstitial liquid and less than 5,000 gal 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.
-------------------------	---

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), in accordance with WHC-SD-WM-SAR-006 REV 2, <i>Single-Shell Tank Isolation Safety Analysis Report</i> , March 1986.

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 <u>new</u> 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.
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SURVEILLANCE INSTRUMENTATION

Drywells	Drywells are vertical boreholes with 6-in. (internal diameter) carbon steel casings positioned radially around SSTs. Periodic monitoring is done by gamma radiation or neutron 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. These wells range between 50 and 250 ft in depth, and are monitored between the range of 50 to 150 ft. The wells are sealed when not in use. They are called drywells because they do <u>not</u> penetrate to the water table and are therefore usually "dry." There are 759 drywells which are monitored on various frequencies.
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 are monitored by radiation detection probes. Laterals are 4-in. inside diameter steel pipes located 8 to 10 ft below the tank's concrete base. There are three laterals per tank. Laterals are located only in A and SX farms.
Surface Levels	The surface level measurements in all waste storage tanks are monitored by manual or automatic conductivity probes, and recorded and transmitted or inputted to 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.
- Annulus** The annulus is the space between the inner and outer shells on DSTs. 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 constructed of fiberglass or TEFZEL*-reinforced epoxy-polyester resin, sized to extend to within 1 in. of the bottom of the tank steel liner. They are sealed at their bottom ends and have a nominal outside diameter of 3.5 in. 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 58 LOWs (56 are in operation) installed in SSTs that contain or are capable of containing greater than 50,000 gal of drainable interstitial liquid, and in two DSTs only. The LOWs installed in two DSTs, (102-SY and 103-AW Tanks), are constructed of steel and are used for special 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,

*TEFZEL, a trademark of E. I. du Pont de Nemours & Company

bottom of the tank, and the domes. In SSTs, there may be one or more thermocouple trees installed directly in a tank, although some SSTs do not have any trees installed. A single thermocouple 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 Photography In-tank photographs may be taken to aid in resolving in-tank measurement anomalies and determine tank integrity. Photographs help determine sludge and liquid levels by visual examination.

4. INVENTORY AND STATUS BY TANK - COLUMN CALCULATIONS (SINGLE-SHELL TANKS)

COLUMN HEADING

Total Waste	Solids Volume plus Supernatant liquid.
Supernatant Liquid	Drainable Liquid Remaining minus Drainable Interstitial. Supernate is usually derived by subtracting the solids level measurement from the liquid level measurement.
Drainable Interstitial	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.
Pumped This Month	Total pumped this month
Total Pumped	Cumulative total pumped 1979 to date.
Drainable Liquid Remaining	Supernate plus Drainable Interstitial.
Pumpable Liquid Remaining	Drainable Liquid Remaining less undrainable heel volume.
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 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 may be used to estimate the saltcake volume.

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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 Photo Date	Date of latest in-tank photographs taken.
Change Since Last Monthly Report	Indicates any change made since the previous month. Explanation for the change follows the Inventory and Status by Tank section.

WMC-EP-0182-69

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APPENDIX D

**TANK FARM CONFIGURATION, STATUS, AND
FACILITY CHARTS**

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D-3

75 ft Diameter Double-Shell Tank
Tank Farms: AN, AP, AW, AY, AZ, SY

* AY and AZ Have a Tank Capacity of 1,000,000 gal

75 ft Diameter Single-Shell Tank
Tank Farms: A*, AX*, SX

* A and AX have flat bottoms

75 ft Diameter Single-Shell Tank
Tank Farms: BY, S, TX, TY

75 ft Diameter Single-Shell Tank
Tank Farms: B, BX, C, T, U

20 ft Diameter Single-Shell Tank
Tank Farms: B, C, T, U

Figure D-1. High-Level Waste Tank Configuration

29103062.1a

WHC-EP-0182

Figure D-2. Double-Shell Tank Instrumentation Configuration

Figure D-3. Single-Shell Tank Instrumentation Configuration

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Op's limit 1,140,000 gal. Constructed 1974-78

200 West Tank Farms
Double-Shell Tank Status

Op's limit 1,140,000 gal. Constructed 1980-81

Op's Limit 1,140,000 gal. Constructed 1983-88

Op's limit 1,140,000 gal. Constructed 1978-80

Op's limit 980,000 gal. Constructed 1968-70

Op's limit 980,000 gal. Constructed 1971 & 1977

200 East Tank Farms
Double-Shell Tank Status

Complex
Concentrate

Dilute

Dilute
Complex
Waste Concentrated
Phosphate
Waste Neutralized
Current
Acid
Waste (NCAR)

PFF

Sludge

Double-Shell
Slurry/Food NCARW
Neutralized Current
Removal Waste

H = Potential Flammable Gases

(Hydrogen) (WHC-WF-0410)

GF = Grain Feed Tanks

TT = Transfer Tank

XXX = Sludge (in K gal.)

Updated Quarterly 12/31/93

DSY-LVL/S.G.SPENCER/01-04

Figure D-4. Double-Shell Tank Status

1,000,000 gal. tanks Constructed 1954-55

1,000,000 gal. tanks Constructed 1963-64

500,000 gal. tanks Constructed 1943-44

55,000 gal. tanks

500,000 gal. tanks Constructed 1946-47

750,000 gal. tanks Constructed 1948-49

500,000 gal. tanks Constructed 1943-44

55,000 gal. tanks

Figure D-5. 200E Single-Shell Tank Status

750,000 gal. tanks Constructed 1950-51

1,000,000 gal. tanks Constructed 1953-54

500,000 gal. tanks Constructed 1943-44

55,000 gal. tanks

750,000 gal. tanks Constructed 1947-48

750,000 gal. tanks Constructed 1951-52

500,000 gal. tanks Constructed 1943-44

55,000 gal. tanks

Fig. D-6. 200W Single-Shell Tank Status

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

Single Walled Pipe Direct Buried

All Tanks 75 Foot Diameter
(Except 55,000 gal 20 foot dia.)

Tank Number

Radiation Monitoring
Dry Well - Approx Location
(● = Active ○ = Inactive)

BY-Tank Farm

1948-49

12 @ 758,000 gal

BX-Tank Farm

1946-47

12 @ 530,000 gal

244-BX
DCRT

B-Tank Farm

1943-44

12 @ 530,000 gal

4 @ 55,000 gal

C-Tank Farm

1943-44

12 @ 530,000 gal

4 @ 55,000 gal

AN-Tank Farm

1980-81

7 @ 1,160,000 gal

Radiation Monitoring
Laterals Under Tank
(X = not used)

Drainable Liquid
Remaining (1000 gal)
(Inactive Tanks)

Total Solids
(1000 gal)
Salt Cake/
Sludge/DSS
(Inactive Tanks)

Operating
Exhauster

Watch List and
High Heat Load
Tanks

Liquid Level Gauges
▼ = FIC Read Manually
Y = Tape Read Manually
▽ = Auto FIC on CASS
▽ = Intrusion Mode FIC

Airlift Circulators
(107-AN and 102-AW
are inoperative)

Liquid Observation
Well (Low)

Screen - Jet Pump

Assumed
Leaker

Temperature Reading
Automatic Readings:
By CASS for DSTs
By TMACS for SSTs
(● Manual Readings)

Assumed
Leaked
Date

Watch List Tanks

□ Ferrocyanide

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

▩ Organics

■ High Heat - 106-C only on
Watch List (cooling water added)

Status as of December 31, 1993 - Updated Monthly
Issued by WHC/TWRS/PE

29310073.2C

WHC-EP-0182-70

Double Walled Pipe
 Single Walled Pipe Direct Buried

Single-Shell Double-Shell Interim Stabilized

Sound

DCRT = Double Contained Receiver Tank
 NHW = Neutralized High Level Waste
 PAW = PUREX Acid Waste

Isolated

PI = Partial Interim
 IP = Intrusion Prevention
 Completed

— Radiation Monitoring
Dry Well – Approx Location
(● = Active ○ = Inactive)

Radiation Monitoring
Laterals Under Tank
(X = not used)

Drainable Liquid
Remaining (1000 gal)
(Inactive Tanks)

Liquid Level Gauges
▼ = FIC Read Manually
Y = Tape Read Manually
▽ = Auto FIC on CASS
▽ = Intrusion Mode FIC

Airlift Circulators

Liquid Observation
Well (Low)

Screen - Jet Pump

Total Solids
(1000 gal)
Salt Cake/
Sludge/DSS
(Inactive Tanks)

Operating
Exhauster

Watch List and
High Heat Load
Tanks

Temperature Reading
Automatic Readings:
by CASS for DSTs
By TMACS for SSTs
(Manual Readings)

Assumed
Leaked Date

Assumed
Leaker

Watch List Tanks

- Ferrocyanide**
- H2/Flammable gases (109-SX has potential only-other tanks vent thru it)**
- Organics**
- High Heat - 106-C only on Watch List (cooling water added)**

Status as of December 31, 1993 - Updated Monthly
Issued by WHC/TWRS/PE

APPENDIX E

**MONTHLY SUMMARY
TANK USE SUMMARY
INVENTORY SUMMARY BY TANK FARM
INVENTORY AND STATUS BY TANK**

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AIM

Association for Information and Image Management

1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910
301/587-8202

Centimeter

Inches

MANUFACTURED TO AIM STANDARDS
BY APPLIED IMAGE, INC.

2 of 2

TABLE E-1. MONTHLY SUMMARY

TANK STATUS

December 31, 1993

	200 EAST AREA	200 WEST AREA	TOTAL
IN SERVICE	25	3	28 (2)
OUT OF SERVICE	66	83	149
SOUND	59	51	110
ASSUMED LEAKER	32	35	67
INTERIM STABILIZED	51	55	106 (1)
ISOLATED			
PARTIAL INTERIM	21	30	51
INTRUSION PREVENTION COMPLETED	45	53	98

WASTE VOLUMES (Kgallons)

	200 EAST AREA	200 WEST AREA	TOTAL	SST TANKS	DST TANKS	TOTAL
<u>SUPERNATANT</u>						
AGING Aging waste	1775	0	1775	0	1775	1775
CC Complexant concentrate waste	1941	193	2134	3	2131	2134
CP Concentrated phosphate waste	4	0	4	0	4	4
DC Dilute complexed waste	808	1	809	1	808	809
DN Dilute non-complexed waste	10644	0	10644	0	10644	10644
DN/PD Dilute non-complex/PUREX TRU solids	1031	0	1031	0	1031	1031
DN/PT Dilute non-complex/PFP TRU solids	0	652	652	0	652	652
DSSF Double-shell slurry feed	3825	48	3873	57	3816	3873
NCPLX Non-complexed waste	214	293	507	507	0	507
TOTAL SUPERNATANT	20242	1187	21429	568	20861	21429
<u>SOLIDS</u>						
Double-shell slurry	937	1103	2040	0	2040	2040
Sludge	8206	5930	14136	12181	1955	14136
Saltcake	6577	17529	24106	23346	760	24106
TOTAL SOLIDS	15720	24562	40282	35527	4755	40282
TOTAL WASTE	35962	25749	61711	36095	25616	61711
AVAILABLE SPACE IN TANKS	4827	837	5664	0	5664 (2)	5664
DRAINABLE INTERSTITIAL	2220	4492	6712	6273	439	6712
DRAINABLE LIQUID REMAINING	22463	5679	28142	6842	21300	28142

(1) Includes six tanks that do not meet current established supernatant and interstitial liquid stabilization criteria, B-104, 110, 111, T-102, T-112, and U-110.

(2) Includes six double-shell tanks on Hydrogen Watch List not currently allowed to receive waste, 103-AN, 104-AN, 105-AN, 101-AW, 101-SY, and 103-SY.

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

TABLE E-2. TANK USE SUMMARY

December 31, 1993

TANK FARMS	IN SERVICE	OUT OF SERVICE	SOUND	ASSUMED LEAKER	ISOLATED TANKS PARTIAL INTERIM	INTRUSION PREVENTION	INTERIM STABILIZED TANKS
EAST							
A	0	6	3	3	2	4	5
AN	7 (2)	0	7	0	0	0	0
AP	8	0	8	0	0	0	0
AW	6 (2)	0	6	0	0	0	0
AX	0	4	2	2	1	3	3
AY	2	0	2	0	0	0	0
AZ	2	0	2	0	0	0	0
B	0	16	6	10	0	16	16 (1)
BX	0	12	7	5	6	6	10 (1)
BY	0	12	7	5	5	7	7
C	0	16	9	7	7	9	10
Total	25	66	50	32	21	45	51
WEST							
S	0	12	11	1	10	2	2
SX	0	15	5	10	6	9	9
SY	3 (2)	0	3	0	0	0	0
T	0	16	9	7	5	11	12 (1)
TX	0	18	10	8	0	18	18
TY	0	6	1	5	0	6	6
U	0	16	12	4	9	7	8 (1)
Total	3	83	51	35	30	53	55
TOTAL	28	149	110	67	51	98	106

(1) Includes six tanks that do not meet current established supernatant and interstitial liquid stabilization criteria (B-104, 110, 111, T-102, 112, and U-110).

(2) Six Double-Shell Tanks on the Hydrogen Tank Watch List are not currently in service (AN-103, 104, 105, AW-101, SY-101 and 103).

TABLE E-3. INVENTORY SUMMARY BY TANK FARM

WASTE VOLUMES (Kgallons)

December 31, 1993

SUPERNATANT LIQUID VOLUMES

SOLIDS VOLUME

TANK FARM	TOTAL WASTE	AVAIL SPACE	<i>SUPERNATANT LIQUID VOLUMES</i>										<i>SOLIDS VOLUME</i>			
			AGING	CC	CP	DC	DN	DN/PD	DN/PT	DSSF	NCPLX	TOTAL	DSS	SLUDGE	CAKE	TOTAL
EAST																
A	1537	0	0	0	0	0	0	0	0	9	0	9	0	556	972	1528
AN	6024	1956	0	1938	4	0	700	0	0	1941	0	4583	937	504	0	1441
AP	7269	1851	0	0	0	0	6448	0	0	821	0	7269	0	0	0	0
AW	6000	840	0	0	0	0	2584	1031	0	1054	0	4669	0	1135	196	1331
AX	906	0	0	3	0	0	0	0	0	0	0	3	0	19	884	903
AY	1835	125	0	0	0	808	912	0	0	0	0	1720	0	115	0	115
AZ	1905	55	1775	0	0	0	0	0	0	0	0	1775	0	130	0	130
B	2057	0	0	0	0	0	0	0	0	0	15	15	0	1697	345	2042
BX	1539	0	0	0	0	0	0	0	0	0	30	30	0	1354	155	1509
BY	4744	0	0	0	0	0	0	0	0	0	0	0	0	719	4025	4744
C	2146	0	0	0	0	0	0	0	0	0	169	169	0	1977	0	1977
Total	35962	4827	1775	1941	4	808	10644	1031	0	3825	214	20242	937	5206	6577	15720
WEST																
S	5510	0	0	0	0	0	0	0	0	17	41	58	0	1166	4286	5452
SX	4425	0	0	0	0	1	0	0	0	0	62	63	0	1254	3108	4362
SY	2583	837	0	193	0	0	0	0	652	0	0	845	1103	71	564	1738
T	2034	0	0	0	0	0	0	0	0	0	45	45	0	1989	0	1989
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	638	2744	3382
Total	25749	837	0	193	0	1	0	0	652	48	293	1187	1103	5930	17529	24562
TOTAL	61711	5664	1775	2134	4	809	10644	1031	652	3873	507	21429	2040	14136	24106	40282

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

TABLE E-4. INVENTORY AND STATUS BY TANK
DOUBLE-SHELL TANKS
December 31, 1993

TANK STATUS				LIQUID VOLUME								SOLIDS VOLUME			VOLUME DETERMINATION					CHANGE SINCE LAST MONTHLY REPORT
TANK	WASTE MATL	TANK INTEGRITY	TANK USE	EQUIVA- LENT WASTE INCHES	TOTAL WASTE (Kgal)	AVAIL SPACE (Kgal)	SUPER- NATANT LIQUID (Kgal)	DRAIN- ABLE INTER- STIT. (Kgal)	PUMPED THIS MONTH	TOTAL PUMPED	DRAIN- ABLE LIQUID REMAIN (Kgal)	PUMP- ABLE LIQUID REMAIN (Kgal)	DSS (Kgallons)	SLDG CAKE VOL MTHD	LIQ VOL MTHD	SOL VOL MTHD	SOLIDS VOLUME UPDATE	LAST PHOTO DATE		
***** AN FARM STATUS *****																				
AN-101	DN	SOUND	DRCVR	254.5	700	440	700	0	0.0	0.0	700	700	0	0	0	FM	S	08/22/89	0/ 0/ 0	
AN-102	CC	SOUND	CVHT	398.2	1095	45	1006	3	0.0	0.0	1009	1006	0	89	0	FM	S	08/22/89	0/ 0/ 0	
AN-103	DSS	SOUND	CVHT	346.5	953	187	16	0	0.0	0.0	16	16	937	0	0	FM	S	08/22/89	10/29/87	
AN-104	DSSF	SOUND	CVHT	384.7	1058	82	794	25	0.0	0.0	819	797	0	264	0	FM	S	08/22/89	08/19/88	
AN-105	DSSF	SOUND	CVHT	411.3	1131	9	1131	0	0.0	0.0	1131	1131	0	0	0	FM	S	10/22/84	01/26/88	
AN-106	CP	SOUND	CVHT	7.6	21	1119	4	0	0.0	0.0	4	4	0	17	0	FM	S	08/22/89	0/ 0/ 0	
AN-107	CC	SOUND	CVHT	387.6	1066	74	932	9	0.0	0.0	941	932	0	134	0	FM	S	08/22/89	09/01/88	
7 DOUBLE-SHELL TANKS				TOTALS:	6024	1956	4583	37	0.0	0.0	4620	4586	937	504	0					
***** AP FARM STATUS *****																				
AP-101	DN	SOUND	DRCVR	385.5	1060	80	1060	0	0.0	0.0	1060	1060	0	0	0	FM	S	05/01/89	0/ 0/ 0	
AP-102	DN	SOUND	GRTFD	401.5	1104	36	1104	0	0.0	0.0	1104	1104	0	0	0	FM	S	07/11/89	0/ 0/ 0	
AP-103	DN	SOUND	DRCVR	411.3	1131	9	1131	0	0.0	0.0	1131	1131	0	0	0	FM	S	10/13/88	0/ 0/ 0	
AP-104	DN	SOUND	GRTFD	6.5	18	1122	18	0	0.0	0.0	18	18	0	0	0	FM	S	10/13/88	0/ 0/ 0	
AP-105	DSSF	SOUND	CVHT	298.5	821	319	821	0	0.0	0.0	821	821	0	0	0	FM	S	02/02/89	0/ 0/ 0	
AP-106	DN	SOUND	DRCVR	410.2	1128	12	1128	0	0.0	0.0	1128	1128	0	0	0	FM	S	10/13/88	0/ 0/ 0	
AP-107	DN	SOUND	DRCVR	402.9	1108	32	1108	0	0.0	0.0	1108	1108	0	0	0	FM	S	10/13/88	0/ 0/ 0	
AP-108	DN	SOUND	DRCVR	326.9	899	241	899	0	0.0	0.0	899	899	0	0	0	FM	S	10/13/88	0/ 0/ 0	
8 DOUBLE-SHELL TANKS				TOTALS:	7269	1851	7269	0	0.0	0.0	7269	7269	0	0	0					

TABLE E-4. INVENTORY AND STATUS BY TANK
DOUBLE-SHELL TANKS
December 31, 1993

TANK STATUS				LIQUID VOLUME								SOLIDS VOLUME			VOLUME DETERMINATION					CHANGE SINCE LAST MONTHLY REPORT
TANK	WASTE MATL	TANK INTEGRITY	TANK USE	EQUIVA-	TOTAL WASTE (Kgal)	AVAIL SPACE (Kgal)	SUPER- NATANT LIQUID (Kgal)	DRAIN- ABLE INTER- STIT. (Kgal)	PUMPED THIS MONTH	TOTAL PUMPED	DRAIN- ABLE LIQUID REMAIN (Kgal)	PUMP- ABLE LIQUID REMAIN (Kgal)	DSS (Kgallons)	SLDG	CAKE	LIQ VOL MTHD	SOL VOL MTHD	SOLIDS VOLUME UPDATE	LAST PHOTO DATE	
				LENT INCHES																
				++++++ AW FARM STATUS ++++++																
AW-101	DSSF	SOUND	CWHT	413.8	1138	2	1054	2	0.0	0.0	1056	1054	0	84	0	FM	S	10/22/84	03/17/88	
AW-102	DN	SOUND	EVFD	351.3	966	174	965	0	0.0	0.0	965	965	0	1	0	FM	S	02/29/84	02/02/83	
AW-103	DN/PD	SOUND	DRCVR	235.3	647	493	284	37	0.0	0.0	321	299	0	363	0	FM	S	02/01/89	0/ 0/ 0	
AW-104	DN	SOUND	DRCVR	408.4	1123	17	833	49	0.0	0.0	882	860	0	179	111	FM	S	03/05/87	02/02/83	
AW-105	DN/PD	SOUND	DRCVR	379.6	1044	96	747	29	0.0	0.0	776	754	0	297	0	FM	S	03/05/87	0/ 0/ 0	
AW-106	DN	SOUND	SRCVR	393.5	1082	58	786	42	0.0	0.0	828	806	0	211	85	FM	S	01/31/92	02/02/83	
6 DOUBLE-SHELL TANKS				TOTALS:	6000	840	4669	159	0.0	0.0	4828	4738	0	1135	196					
				++++++ AY FARM STATUS ++++++																
AY-101	DC	SOUND	DRCVR	324.0	891	89	808	2	0.0	0.0	810	808	0	83	0	FM	S	02/02/87	12/28/82	
AY-102	DN	SOUND	DRCVR	343.3	944	36	912	0	0.0	0.0	912	912	0	32	0	FM	S	02/10/88	04/28/81	
2 DOUBLE-SHELL TANKS				TOTALS:	1835	125	1720	2	0.0	0.0	1722	1720	0	115	0					
				++++++ AZ FARM STATUS ++++++																
AZ-101	AGING	SOUND	CWHT	338.5	931	49	896	0	0.0	0.0	896	896	0	35	0	FM	S	09/30/90	08/18/83	
AZ-102	AGING	SOUND	DRCVR	354.2	974	6	879	4	0.0	0.0	883	879	0	95	0	FM	S	06/04/92	12/24/84	
2 DOUBLE-SHELL TANKS				TOTALS:	1905	55	1775	4	0.0	0.0	1779	1775	0	130	0					

TABLE E-4. INVENTORY AND STATUS BY TANK
DOUBLE-SHELL TANKS
December 31, 1993

TANK STATUS				LIQUID VOLUME									SOLIDS VOLUME			VOLUME DETERMINATION					
TANK	WASTE MATL	TANK INTEGRTY	TANK USE	EQUIVA-	TOTAL WASTE	AVAIL SPACE	NATANT LIQUID	DRAIN-	PUMPED THIS MONTH	TOTAL PUMPED	DRAIN-	PUMP-	DSS (Kgallons)	SLDG	CAKE	LIQ VOL MTHD	SOL VOL MTHD	SOLIDS VOLUME UPDATE	LAST PHOTO DATE	CHANGE SINCE LAST MONTHLY REPORT	
				LENT WASTE INCHES				ABLE INTER-STIT. (Kgal)			ABLE LIQUID REMAIN (Kgal)	ABLE LIQUID REMAIN (Kgal)									
+++++ SY FARM STATUS +++++																					
SY-101	CC	SOUND	CWHT	400.7	1102	38	12	237	0.0	0.0	249	243	530	0	560	FM	S	01/31/92	04/12/89		
SY-102	DN/PT	SOUND	DRCVR	262.9	723	417	652	0	0.0	0.0	652	652	0	71	0	FM	S	05/12/87	04/29/81		
SY-103	CC	SOUND	CWHT	275.6	758	382	181	0	0.0	0.0	181	181	573	0	4	FM	S	10/22/84	10/01/85		
3 DOUBLE-SHELL TANKS				TOTALS:	2583	837	845	237	0.0	0.0	1082	1076	1103	71	564						
GRAND TOTAL					25616	5664	20861	439				21300	21164	2040	1955	760					

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

Tank Farms	Available Space Calculations Used In This Document (Most Conservative)	Document SD-WM-TI-357*		Document OSD-T-151-00007** Specification Limit
		Operating Limit	Tank Capacity	
AN, AP, AW, SY	1,140,000 gal (414.5 in.)	1,144,000 gal (416 in.)	1,160,000 gal (421.8 in.)	1,160,500 gal (422 in.)
AY, AZ (Aging Waste)	980,000 gal (356.4 in.)	990,000 gal (360 in.)	1,000,000 gal (363.6 in.)	1,001,000 gal (364 in.)

* WMC-SD-WM-TI-357, "Waste Storage Tank Status and Leak Detection Criteria."

**WMC-OSD-T-151-00007, "Operating Specifications for 241-AN, AP, AW, AY, AZ, & SY Tank Farms."

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
December 31, 1993

TANK STATUS				LIQUID VOLUME						SOLIDS VOLUME		VOLUME DETERMINATION						
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATANT 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)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE	CHG SINCE	
																SOURCE SEE FOOTNOTE	LAST PHOTO DATE	LAST MNTHLY REPORT
+++++ A FARM STATUS +++++																		
E-9	A-101	DSSF	SOUND	/PI	953	0	413	0.0	0.0	413	390	3	950	P	F	11/21/80		08/21/85
	A-102	DSSF	SOUND	IS/PI	41	4	2	0.0	39.5	6	0	15	22	P	FP	07/27/89	(1)	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	(1)	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	(1)	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		08/17/86
6 SINGLE-SHELL TANKS				TOTALS	1537	9	441	0.0	150.5	450	390	556	972					
+++++ AX FARM STATUS +++++																		
AX-101		DSSF	SOUND	/PI	748	0	320	0.0	0.0	320	298	3	745	P	F	05/06/82		08/18/87
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	3	370	0.0	13.0	373	304	19	884					

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TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
December 31, 1993

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION						
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATANT 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)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS SOURCE SEE FOOTNOTE	LAST PHOTO DATE	CHG SINCE LAST MONTHLY REPORT	
+++++ B FARM STATUS +++++																			
E-10	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	(1)	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	(1)	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	(1)	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	(1)	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	(1)	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	(1)	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	(1)	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	(1)	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	(1)	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	(1)	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	(1)	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		
B-202	NCPLX	SOUND	IS/IP	27	0	3	0.0	0.0	3	0	27	0	F	M	05/31/85	(1)	05/29/85		
B-203	NCPLX	ASMD LKR	IS/IP	51	1	5	0.0	0.0	6	0	50	0	PM	PM	05/31/84	(1)	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	(1)	10/21/87		
16 SINGLE-SHELL TANKS				TOTALS	2057	15	164	0.0	0.0	179	80	1697	345						

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TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
December 31, 1993

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION						
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATANT 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)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE	LAST PHOTO DATE	CHG SINCE LAST MONTHLY REPORT	
																SOURCE SEE FOOTNOTE		LAST	
+++++ BX FARM STATUS +++++																			
BX-101	NCPLX	ASMD LKR	IS/IP	43	1	0	0.0	0.0	1	0	42	0	P	M	04/28/82		11/24/88		
BX-102	NCPLX	ASMD LKR	IS/IP	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	66	4	0	0.0	0.0	4	0	62	0	P	F	11/29/83		10/31/86		
BX-104	NCPLX	SOUND	IS/IP	99	3	30	0.0	17.4	33	27	96	0	F	F	09/22/89	(1)	09/21/89		
BX-105	NCPLX	SOUND	IS/IP	51	5	6	0.0	15.0	11	4	43	3	F	S	09/03/86	(1)	10/23/86		
BX-106	NCPLX	SOUND	/PI	46	15	0	0.0	0.0	15	15	31	0	MP	PS	04/28/82		05/19/88		
BX-107	NCPLX	SOUND	IS/PI	345	1	29	0.0	23.1	30	23	344	0	MP	P	09/18/90	(2)	09/11/90		
BX-108	NCPLX	ASMD LKR	IS/IP	26	0	1	0.0	0.0	1	0	26	0	M	PS	07/31/79	(1)	10/23/86		
BX-109	NCPLX	SOUND	IS/PI	193	0	13	0.0	8.2	13	8	193	0	FP	P	09/17/90	(2)	09/11/90		
BX-110	NCPLX	ASMD LKR	IS/PI	198	0	15	4.0	4.0	17	6	189	9	MP	M	08/22/85	(1)	07/31/85	(a)	
BX-111	NCPLX	ASMD LKR	/PI	211	0	15	23.7	54.7	15	0	68	143	M	M	07/26/77		07/16/93	(b)	
BX-112	NCPLX	SOUND	IS/PI	165	1	7	0.0	4.1	8	2	164	0	FP	P	09/17/90	(2)	09/11/90		
12 SINGLE-SHELL TANKS			TOTALS:	1539	30	120	27.7	126.5	151	85	1354	155							
+++++ BY 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	/PI	341	0	41	0.0	123.3	41	22	0	341	MP	M	08/30/91	(2)	09/11/87		
BY-103	NCPLX	ASMD LKR	/PI	400	0	160	0.0	78.5	160	137	5	395	MP	M	04/03/90	(2)	09/07/89		
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	503	0	192	0.0	0.0	192	169	44	459	P	MP	04/28/82		07/11/86		
BY-106	NCPLX	ASMD LKR	/PI	642	0	235	0.0	0.0	235	213	95	547	P	MP	04/28/82		11/04/82		
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		

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TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
December 31, 1993

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TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATANT 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)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE	CHG SINCE	
																SOURCE SEE FOOTNOTE	LAST PHOTO DATE	LAST MONTHLY REPORT
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	/PI	423	0	78	0.0	93.5	78	57	83	340	F	PS	08/30/91	(2)	10/15/86	
BY-110	NCPLX	SOUND	IS/IP	398	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:	4744	0	780	0.0	1387.4	780	598	719	4025						
+++++ C 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	/PI	423	0	37	0.0	11.6	37	19	423	0	F	FP	04/28/82		05/18/76	
C-103	NCPLX	SOUND	/PI	195	133	0	0.0	0.0	133	133	62	0	F	S	10/22/90	(2)	07/28/87	
C-104	CC	SOUND	IS/IP	295	0	11	0.0	0.0	11	5	295	0	FP	P	09/22/89	(1)	07/25/90	
C-105	NCPLX	SOUND	/PI	150	0	11	0.0	0.0	11	4	150	0	F	S	05/31/85		04/01/88	
C-106	NCPLX	SOUND	/PI	229	32	16	0.0	0.0	48	42	197	0	F	PS	04/28/82		04/05/79	
C-107	DC	SOUND	/PI	275	0	26	0.0	16.3	26	20	275	0	F	S	01/30/92	(2)	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	(1)	12/05/74	
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	/PI	187	0	7	0.0	8.9	7	5	187	0	F	FMP	03/01/92	(2)	08/12/86	
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	
C-112	NCPLX	SOUND	IS/PI	104	0	32	0.0	0.0	32	26	104	0	M	PS	09/18/90	(2)	09/18/90	

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TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
December 31, 1993

TANK STATUS				LIQUID VOLUME						SOLIDS VOLUME		VOLUME DETERMINATION						
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATANT 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)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS SOURCE SEE FOOTNOTE	LAST PHOTO DATE	CHG SINCE LAST MONTHLY REPORT
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:				2146	169	143	0.0	36.8	312	254	1977	0						
+++++ S FARM STATUS +++++																		
S-101	NCPLX	SOUND	/PI	427	12	84	0.0	0.0	96	90	244	171	F	PS	09/16/80		03/18/88	
S-102	DSSF	SOUND	/PI	549	0	230	0.0	0.0	230	208	4	545	P	FP	04/28/82		03/18/88	
S-103	DSSF	SOUND	/PI	248	17	85	0.0	0.0	102	79	10	221	M	S	11/20/80		06/01/89	
S-104	NCPLX	ASMD LKR	IS/IP	294	1	28	0.0	0.0	29	23	293	0	M	M	12/20/84	(1)	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	4	186	0.0	97.0	190	168	28	447	P	FP	12/31/93		03/17/89	(c)
S-107	NCPLX	SOUND	/PI	376	14	45	0.0	0.0	59	52	293	69	F	PS	09/25/80		03/12/87	(d)
S-108	NCPLX	SOUND	/PI	604	0	127	0.0	151.6	127	105	4	600	P	MP	04/28/82		03/12/87	
S-109	NCPLX	SOUND	/PI	568	0	141	0.0	111.0	141	119	13	555	F	PS	09/30/75		08/24/84	
S-110	NCPLX	SOUND	/PI	390	0	110	0.0	185.9	110	103	131	259	F	PS	05/14/92		03/12/87	
S-111	NCPLX	SOUND	/PI	596	10	195	0.0	3.3	205	134	139	447	P	FP	04/28/82		08/10/89	
S-112	NCPLX	SOUND	/PI	523	0	110	0.0	125.1	110	107	5	518	P	FP	12/31/93		03/24/87	(e)
12 SINGLE-SHELL TANKS TOTALS:				5510	58	1376	0.0	788.2	1434	1201	1166	4286						

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TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
December 31, 1993

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION						
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATANT 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)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE	CHG SINCE		
																SOURCE SEE FOOTNOTE	LAST PHOTO DATE	LAST MONTHLY REPORT	
+++++ SX FARM STATUS +++++																			
SX-101 DC	SOUND		/PI	456	1	145	0.0	0.0	146	124	112	343	P	FP	04/28/82		03/10/89		
SX-102 DSSF	SOUND		/PI	543	0	183	0.0	0.0	183	177	117	426	P	M	04/28/82		01/07/88		
SX-103 NCPLX	SOUND		/PI	652	1	232	0.0	0.0	233	211	115	536	F	S	07/15/91		12/17/87		
SX-104 DSSF	ASMD LKR		/PI	614	0	201	0.0	113.2	201	195	136	478	F	S	07/07/89		09/08/88		
SX-105 DSSF	SOUND		/PI	683	0	261	0.0	0.0	261	238	73	610	P	F	04/28/82		06/15/88		
SX-106 NCPLX	SOUND		/PI	538	61	194	0.0	0.0	255	233	12	465	F	PS	10/28/80		06/01/89		
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 (f)		
SX-109 NCPLX	ASMD LKR		IS/IP	250	0	10	0.0	0.0	10	0	0	250	P	M	10/05/93		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		03/10/87		
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:	4425	63	1260	0.0	113.2	1323	1178	1254	3108							

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TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
December 31, 1993

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION						
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATANT 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)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE	CHG SINCE		
																SOURCE SEE FOOTNOTE	LAST PHOTO DATE	LAST Mnthly REPORT	
+++++ T FARM STATUS +++++																			
E-15	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	(1)	07/02/84	
	T-104	NCPLX	SOUND	/PI	445	3	47	0.0	0.0	50	44	442	0	P	MP	04/28/82		06/29/89	
	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	/PI	180	9	13	0.0	0.0	22	16	171	0	P	FP	08/31/84		07/12/84	
	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	
	T-109	NCPLX	ASMD LKR	IS/IP	58	0	0	0.0	0.0	0	0	58	0	M	M	12/30/84	(1)	02/25/93	
	T-110	NCPLX	SOUND	/PI	379	3	39	0.0	0.0	42	36	376	0	P	FP	04/28/82		07/12/84	
	T-111	NCPLX	ASMD LKR	/PI	458	2	49	0.0	0.0	51	45	456	0	P	FP	04/28/82		08/02/84	
	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:	2034	45	200	0.0	25.3	245	178	1989	0						

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TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
December 31, 1993

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION						
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATANT 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)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE	CHG SINCE		
																SOURCE SEE FOOTNOTE	LAST PHOTO DATE	LAST MONTHLY REPORT	
+++++ TX FARM STATUS +++++																			
TX-101	NCPLX	SOUND	IS/IP	87	3	2	0.0	0.0	5	0	84	0	F	P	02/02/84	(1)	10/24/85	(g)	
TX-102	NCPLX	SOUND	IS/IP	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	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	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	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	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	36	1	1	0.0	0.0	2	0	0	35	FP	FP	01/20/84	(1)	10/31/85		
TX-108	NCPLX	SOUND	IS/IP	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	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	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	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	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	607	0	16	0.0	19.2	16	0	0	607	M	PS	05/30/83		04/11/83		
TX-114	NCPLX	ASMD LKR	IS/IP	535	0	15	0.0	104.3	15	0	0	535	M	PS	05/30/83		04/11/83		
TX-115	NCPLX	ASMD LKR	IS/IP	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	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	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	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						

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TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
December 31, 1993

TANK STATUS				LIQUID VOLUME						SOLIDS VOLUME		VOLUME DETERMINATION						
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATANT 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)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE	CHG SINCE	
																SOURCE SEE FOOTNOTE	LAST PHOTO DATE	LAST MONTHLY REPORT
+++++ TY FARM STATUS +++++																		
TY-101	NCPLX	ASMD LKR	IS/IP	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	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	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	46	3	12	0.0	0.0	15	0	43	0	P	FP	06/27/90	(1)	11/03/87	
TY-105	NCPLX	ASMD LKR	IS/IP	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	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 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	374	18	126	0.0	0.0	144	122	43	313	P	MP	04/28/82		06/08/89	
U-103	NCPLX	SOUND	/PI	468	13	176	0.0	0.0	189	166	32	423	P	FP	04/28/82		09/13/88	
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	142	0.0	0.0	179	157	32	349	FM	PS	09/30/78		07/07/88	
U-106	NCPLX	SOUND	/PI	226	15	68	0.0	0.0	83	61	26	185	F	PS	12/30/83		07/07/88	
U-107	DSSF	SOUND	/PI	406	31	147	0.0	0.0	178	156	15	366	F	S	12/30/83		10/27/88	
U-108	NCPLX	SOUND	/PI	468	24	172	0.0	0.0	196	174	29	415	F	S	12/30/83		09/12/84	
U-109	NCPLX	SOUND	/PI	463	19	163	0.0	0.0	182	160	48	396	F	F	11/13/77		07/07/88	
U-110	NCPLX	ASMD LKR	IS/PI	186	0	15	0.0	0.0	15	9	186	0	M	M	12/30/84	(1)	12/11/84	
U-111	DSSF	SOUND	/PI	329	0	122	0.0	0.0	122	99	26	303	PS	FPS	04/28/82		06/23/88	
U-112	NCPLX	ASMD LKR	IS/IP	49	4	0	0.0	0.0	4	0	45	0	P	MP	02/10/84	(1)	08/03/89	

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TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
December 31, 1993

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION						
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATANT 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)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS SOURCE SEE FOOTNOTE	LAST PHOTO DATE	CHG SINCE LAST MONTHLY REPORT	
U-201	NCPLX	SOUND	IS/IP	5	1	0	0.0	0.0	1	0	4	0	M	S	08/15/79		08/03/89		
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:	3550	168	1138	0.0	0.0	1306	1104	638	2744							
GRAND TOTAL				36089	568	6273	28	3877	6842	5372	12180	23345							

NOTES: +/- 1K gal differences are the result of rounding

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"

(1) MHC-SD-RE-TI-178 SST STABILIZATION RECORD, latest revision

(2) TANK FARMS SST ENGINEER MONTHLY INPUT (Retained 10 yr in Monthly Summary Report author's office)

See next page for footnotes in "Chg Since Last Monthly Report"

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TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
December 31, 1993

TANK STATUS			LIQUID VOLUME								SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATANT 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)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS	CHG	
																UPDATE	SINCE	
																SOURCE	LAST	
																SEE	LAST	
																FOOTNOTE	PHOTO	MONTHLY
																REPORT	DATE	

FOOTNOTES:

(a) BX-110 - Following information from Single-Shell Tanks Cognizant Engineer

Pumping began December 4, 1993.

Total waste (Supernatant + Solids) - 198.0 Kgal

Supernatant - 0 Kgal

Drainable Interstitial - 15.4 Kgal

Pumped this Month - 4.0 Kgal

Total Pumped - 4.0 Kgal

Drainable Liquid Remaining - 16.6 Kgal

Pumpable Liquid Remaining - 6.0 Kgal

Sludge - 189.0 Kgal

Saltcake - 9.0 Kgal

(b) BX-111 - Following information from Single-Shell Tanks Cognizant Engineer

Pumping began October 22, 1993

Total waste (Supernatant + Solids) - 211.0 Kgal

Supernatant - 0 Kgal

Drainable Interstitial - 14.5 Kgal

Pumped this Month - 23.7 Kgal

Total Pumped - 54.7 Kgal

Drainable Liquid Remaining - 14.5 Kgal

Pumpable Liquid Remaining - 0 Kgal (PLR is being reflected as "0" because the gallons pumped have exceeded the estimate of the gallons remaining when pumping began. PLR will be re-estimated when pumping is completed.)

Sludge - 68.0 Kgal

Saltcake - 143.0 Kgal

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
December 31, 1993

TANK STATUS			LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION						
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	NATANT 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)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS	CHG	
																SOURCE	LAST	
																SEE	PHOTO	LAST
																FOOTNOTE	DATE	MONTHLY REPORT

An investigation was conducted and an evaluation completed in December 1993, concerning discrepancies between current waste inventory and manual level readings. The review of past waste level surveillance records and in-tank photos revealed the reasons for these discrepancies. Many tanks have erroneous FIC level readings due to mounds and valleys on the waste surface, holes in the waste surface where the FIC falls, and/or debris below the tape plummet which causes a discrepancy between current values and the waste level surveillance records. Also, several FIC tapes are set in the intrusion mode, which will show a small discrepancy.

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The following five tanks were changed to reflect the results of this investigation:

- (c) S-106
Total waste (Supernatant + Solids) - 479.0 Kgal
Supernatant - 4 Kgal
Drainable Interstitial - 186 Kgal
Pumped this Month - N/A Kgal
Total Pumped - 97 Kgal
Drainable Liquid Remaining - 190 Kgal
Pumpable Liquid Remaining - 168 Kgal
Sludge - 28.0 Kgal
Saltcake - 447.0 Kgal

It appears the solids level was not updated after the saltwell pumping campaign in July 1979, when 97,000 gal of liquid was pumped. Pumping is to resume in FY 1996. This tank has had numerous baseline adjustments for unexplainable rising liquid levels.

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TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
December 31, 1993

TANK STATUS			LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE TANK MATERIAL INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	NATANT LIQUID (Kgal)	DRAIN- ABLE INTER- STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN- ABLE REMAIN (Kgal)	PUMP- ABLE REMAIN (Kgal)	SLUDGE (Kgal)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS	CHG	
															UPDATE	SINCE	
															SOURCE	LAST	
															SEE	LAST	
															FOOTNOTE	PHOTO	MONTHLY
															DATE	REPORT	

(d) S-107
Total waste (Supernatant + Solids) - 376.0 Kgal
Supernatant - 14 Kgal
Drainable Interstitial - 45 Kgal
Pumped this Month - N/A Kgal
Total Pumped - N/A Kgal
Drainable Liquid Remaining - 59 Kgal
Pumpable Liquid Remaining - 52 Kgal
Sludge - 293 Kgal
Saltcake - 69.0 Kgal

Comparison of 1983 and 1987 photo packages indicate an increase. Based on this influx an elevation was extrapolated for 1993, which correlates with the current liquid level. Drainable liquid and supernatant were changed to reflect this increase.
This tank is Sound, Partial Interim Isolated, and not yet Stabilized.

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
December 31, 1993

TANK STATUS			LIQUID VOLUME					SOLIDS VOLUME				VOLUME DETERMINATION						
TANK	WASTE TANK	MATERIAL INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATANT 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)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS SOURCE SEE FOOTNOTE	LAST PHOTO DATE	CHG SINCE LAST MONTHLY REPORT

(e) S-112
Total waste (Supernatant + Solids) - 523.0 Kgal
Supernatant - 0 Kgal
Drainable Interstitial - 110 Kgal
Pumped this Month - N/A Kgal
Total Pumped - 125.1 Kgal
Drainable Liquid Remaining - 110 Kgal
Pumpable Liquid Remaining - 107 Kgal
Sludge - 4.9 Kgal
Saltcake - 517.7 Kgal

Photo package comparison shows many drop offs of materials along the side walls from 1979 to 1981, and numerous baseline adjustments were made. The level has remained constant since 1981 and the 1987 photos are very similar to the 1981 photos. This tank is Sound, Partial Interim Isolated, and not yet Stabilized.

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
December 31, 1993

TANK STATUS			LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION						
TANK	WASTE TANK MATERIAL	INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATANT 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)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS	CHG	
																UPDATE	SINCE	
																SOURCE	LAST	
																SEE	LAST	
																FOOTNOTE	PHOTO	MONTHLY
																DATE	REPORT	

(f) SX-108
Total waste (Supernatant + Solids) - 87 Kgal
Supernatant - 0 Kgal
Drainable Interstitial - 4.5 Kgal
Pumped this Month - N/A Kgal
Total Pumped - N/A Kgal
Drainable Liquid Remaining - 4.5 Kgal
Pumpable Liquid Remaining - 0 Kgal
Sludge - 87.0 Kgal
Saltcake - 0 Kgal

An incorrect length tape was installed as a replacement in October 1976. This tape, short by approximately 10 inches, was used to Administratively Stabilize the tank in 1979. The correct length tape was installed in January 1983, but the Monthly Summary Report was not updated with the correct volume of waste.

This tank is an Assumed Leaker, Stabilized, and Intrusion Prevention completed.

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
December 31, 1993

TANK STATUS			LIQUID VOLUME				SOLIDS VOLUME				VOLUME DETERMINATION						
TANK	WASTE TANK	MATERIAL INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER- NATANT 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)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS SOURCE SEE FOOTNOTE	CHG SINCE LAST MONTHLY REPORT

(g) TX-102
Total waste (Supernatant + Solids) - 217 Kgal
Supernatant - 0 Kgal
Drainable Interstitial - 22.0 Kgal
Pumped this Month - N/A Kgal
Total Pumped - 94 Kgal
Drainable Liquid Remaining - 22.0 Kgal
Pumpable Liquid Remaining - 0 Kgal
Sludge - 0 Kgal
Saltcake - 217 Kgal

The incorrect length of tape was used to measure surface level in the tank at the time of stabilization in March 1983. The faulty tape was replaced in November 1983, but the Monthly Summary Report was not updated with the correct volume.
This tank is an Assumed Leaker, Stabilized, and Intrusion Prevention completed.

APPENDIX F
PERFORMANCE SUMMARY

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TABLE F-1. PERFORMANCE SUMMARY (Sheet 1 of 3)

WASTE VOLUMES (Kgallons)

December 31, 1993

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

SOURCE	THIS MONTH	FY1994 TO DATE
B PLANT	0	0
PUREX TOTAL (1)	7	41
PFZ (1)	0	0
T PLANT (1)	0	0
S PLANT (1)	0	0
300/400 AREAS (1)	0	8
SULFATE WASTE - 100 N (2)	0	0
MINI-RUN (14)	24	27
TANK FARMS & SALTWELL LIQUID (5)	50	72
OTHER GAINS	41	56
Slurry Increase (3)	3	
Condensate	22	
Instrument change (7)	15	
Unknown (5)	1	
OTHER LOSSES	-40	-130
Slurry decrease (3)	-1	
Evaporation (4)	-14	
Instrument change (7)	-14	
Unknown (5)	-11	
EVAPORATED	0	0
GROUTED	0	0
Total	91	109

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

* C-105 was removed from the High Heat Load list effective 7/1/93.
(See June 1993 report)

Water was added to C-106 during December 1993

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

SOURCE	THIS MONTH	FY1994 TO DATE
100-C (5)	7	15
Losses	-4	-17
Total	3	-2

CUMULATIVE EVAPORATION - 1950 TO PRESENT
WASTE VOLUME REDUCTION

FACILITY	
242-B EVAPORATOR (9)	7172
242-T EVAPORATOR (1957-1958)	9151
IN-TANK SOLIDIFICATION UNIT 1 (10)	11876
IN-TANK SOLIDIFICATION UNIT 2 (10)	15295
IN-TANK SOLID UNIT 1 & 2 (10)	7900
(after conversion of Unit 1 to a cooler for Unit 2)	
242-T (400000) (9)	24471
242-S EVAPORATOR (11)	41983
242-A EVAPORATOR (12)	65227
B PLANT (C-105) (13)	1185
REDOX (12)	12393
Total	198748

TOTAL THROUGHPUT

FACILITY	
242-A EVAPORATOR (12)	182437
242-S EVAPORATOR (11)	134587
Total	317024

Footnotes: See Next Page

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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 (Na_2SO_4).
- (3) Slurry increase/growth is caused by gas generation within the waste. The gas which is trapped in the waste expands in the tank causing the surface level and volume to increase. Slurry decrease results from the periodic release of gas in the waste.
- (4) Aging waste tanks
- (5) Unknown waste gains or losses may be the result of rounding calculations, clean water slowly leaking through a valve, changes in levels (expansion/contraction) because of ambient temperature changes, different measuring devices being used by Tank Farm operators, transfers taking place during the end of the month, Tank Farm activities such as miscellaneous water additions not associated with facility waste generation, or the addition of water which is added to aging waste tanks and then evaporated off.
- (6) Includes Tank Farms miscellaneous flushes (flushes are used to "clean out" pipelines and reduce personnel exposure, reduce potential for waste incompatibility, prevent line plugging, and reduce waste content of potential spills or leaks), and saltwell liquid, which results from pumping of single-shell tanks to double-shell tanks.
- (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. These instrument changes are made when the automatic FIC is out of service and the reading from the manual tape is used for reporting purposes. The reported reading reverts back to the automatic FIC when it is repaired.
- (8) Water is periodically added 106-C to provide evaporative cooling. Losses due to evaporation are calculated assuming all losses are evaporative losses. Some drywells are monitored weekly and some are monitored every two weeks on tank 106-C. If there are any indications of a leak from this tank, the assumption that all losses are due to evaporation will be reevaluated.

WASTE VOLUME REDUCTION

- (9) Currently inoperative. These evaporator systems (242-B and 242-T) were installed in 1952 in each of the two operating areas to remove water from the waste, and ran for approximately 4 yr after which both units were shut down. The 242-T Evaporator was reactivated in December 1965, and shut down again in April 1976.
- (10) Currently inoperative. These two in-tank solidification (ITS) units provided in-tank heating to promote in-tank boiling or evaporation. The ITS Unit 1 started up March 1965, and ITS Unit 2 started up February 1968. In August 1971, ITS Unit 1 was converted from an evaporator to a cooler for ITS Unit 2. Both units were shut down June 1976.
- (11) Currently inoperative. The 242-S Evaporator-Crystallizer was started up November 1973, and shut down March 1980, when its processing campaign was completed. It is in standby mode with no future mission. This evaporator operates under a vacuum, employing evaporative concentration with subsequent crystallization and precipitation of salt crystals.
- (12) Currently inoperative. The 242-A Evaporator-Crystallizer was started up March 1977, and shut down April 1989 because of regulatory issues, and has 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).
- (13) Currently inoperative. Additional concentration of wastes was completed by using the concentrators at REDOX and B Plant. The REDOX concentrator was used from July 1967 to June 1972, while the B Plant concentrator was used from July 1967 to February 1968.
- (14) Waste generated for training and testing purposes prior to Evaporator restart.

APPENDIX G

**PUMPING RECORD
LIQUID STATUS AND PUMPABLE LIQUID
REMAINING IN TANKS**

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TABLE G-1. PUMPING RECORD

(Kgallons)

December 31, 1993

<i>TANK FARMS</i>	<i>PUMPED THIS MONTH</i>	<i>PUMPED FY TO DATE</i>	<i>CUMULATIVE TOTAL PUMPED 1979 TO DATE</i>
EAST			
A	0.0	0.0	150.5
AN	N/A	N/A	N/A
AP	N/A	N/A	N/A
AW	N/A	N/A	N/A
AX	0.0	0.0	13.0
AY	N/A	N/A	N/A
AZ	N/A	N/A	N/A
B	0.0	0.0	0.0
BX	27.7	58.7	126.5
BY	0.0	0.0	1387.4 (a)
C	0.0	0.0	36.8 (b)
Total	27.7	58.7	1714.8
WEST			
S	0.0	0.0	791.0
SX	0.0	0.0	113.2
SY	N/A	N/A	N/A
T	0.0	0.0	25.3
TX	0.0	0.0	1205.7
TY	0.0	0.0	29.9
U	0.0	0.0	0.0
Total	0.0	0.0	2165.1
TOTAL	27.7	58.7	3879.9

NA = Not Applicable

- (a) The total volume pumped was adjusted by the Single-Shell Tanks Engineer to account for the 14% miscalibration of the constant velocity transmitter and the amount of flush water used. DIL, DLR and PLR volumes were recalculated, based on the observed porosity in 102 and 109-BY.
- (b) The total volume pumped was recalculated by the Single-Shell Tanks Engineer based on the surface level readings taken after shutdown of the saltwell pumps on January 28, 1992, in 102-C, 107-C and 110-C, and revised again based on recalculation of flush water additions on January 26, 1993. (The total for the tank farm remains the same, the amount pumped varied among the three tanks).

**TABLE G-2. LIQUID STATUS AND PUMPABLE LIQUID
REMAINING IN TANKS**

WASTE VOLUMES (Kgallons)

December 31, 1993

TANK FARMS	SUPERNATANT LIQUID	DRAINABLE INTERSTITIAL LIQUID	DRAINABLE LIQUID REMAINING	PUMPABLE LIQUID REMAINING
EAST				
A	9	441	450	390
AN	4583	37	4620	N/A
AP	7269	0	7269	N/A
AW	4669	159	4828	N/A
AX	3	370	373	304
AY	1720	2	1722	N/A
AZ	1775	4	1779	N/A
B	15	164	179	80
BX	30	120	151	85
BY	0	780	780	598
C	169	143	312	254
Total	20242	2220	22463	1711
WEST				
S	58	1376	1434	1201
SX	63	1260	1323	1178
SY	845	237	1082	N/A
T	45	200	245	178
TX	5	250	255	0
TY	3	31	34	0
U	168	1138	1306	1104
Total	1187	4492	5679	3061
TOTAL	21429	6712	28142	4772 (1)

(1) Volume based on 12.5% (sludge waste) and 45% (saltcake waste) liquid in solid (porosity) value. This is a conservative (high) estimate.

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

N/A = Not applicable

APPENDIX H
CATCH TANKS AND SPECIAL
SURVEILLANCE FACILITIES

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TABLE H-1. EAST AND WEST AREA CATCH TANKS AND SPECIAL SURVEILLANCE FACILITIES

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

December 31, 1993

FACILITY	LOCATION	PURPOSE (receives waste from:)	VOLUME	MONITORED		REMARKS
			OF	CONTENTS	BY	
(Gallons)						
EAST AREA						
241-A-302-A	A FARM	151-A DB	1518	CASS/FIC	PUMPED 08/11/92	
241-311-ER	B PLANT	151-ER, 152-ER DB	7790	CASS/FIC	PUMPED 05/29/91	
241-152-AX	AX FARM	152-AX DB	1927	MANUALLY	DIAL O/S, USING ZIP CORD, PUMPED 08/29/92	
241-151-AZ	AZ FARM	152-AZ DB, AZ LOOP SEAL	1130	CASS/FIC	VOLUME CHANGES DAILY	
241-154-AZ	AZ FARM	102-AZ HTG COIL STEAM CONDENSATE	0	CASS/MT	AUTOMATIC PUMP	
244-BX-TK/SMP	BX COMPLEX	DCRT - RECEIVES FROM SEVERAL FARMS	20016	MANUALLY	USING MANUAL TAPE FOR TANK	
244-A-TK/SMP	A COMPLEX	DCRT - RECEIVES FROM SEVERAL FARMS	6188	MCS		
204-AR	AY FARM	RR CARS DURING TRANSFER TO REC. TKS	650	DIP TUBE	ALARMS ON CASS	
417-A	A FARM	702-A PROCESS CONDENSATE	31860	DIP TUBE		
Vent Station Catch Tank		CROSS COUNTRY TRANSFER LINE	604	MT		
WEST AREA						
241-TX-302-C	TX FARM	154-TX DB	3916	CASS/FIC	FIC REPAIRED	
241-U-301-B	U FARM	151-U, 152-U, 153-U, 252-U DB	6742	CASS/FIC	RETURNED TO SERVICE 12/30/93	
241-UX-302-A	U PLANT	154-UX DB	11751	CASS/MFIC		
241-S-304	S FARM	151-S DB	2114	RS	OPERATIONAL 10/91, REPLACED S-302-A	
244-S-TK/SMP	S FARM	DCRT - RECEIVES FROM SEVERAL FARMS	10571	MANUALLY	CWF	
244-TX-TK/SMP	TX FARM	DCRT - RECEIVES FROM SEVERAL FARMS	18389	MANUALLY	MT	

Total active facilities 16

LEGEND: DB - Diversion Box
 DCRT - Double-Contained Receiver Tank
 TK - Tank
 SMP - Sump
 R - Usually denotes replacement
 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
 MCS - Monitor and Control System
 O/S - Out of Service

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TABLE H-2. EAST AREA CATCH TANKS AND SPECIAL SURVEILLANCE FACILITIES

INACTIVE - no longer receiving waste transfers

December 31, 1993

FACILITY	LOCATION	RECEIVED WASTE FROM:	VOLUME OF CONTENTS (Gallons)	MONITORED BY	REMARKS
241-A-302-B	A FARM	152-A DB	4150	CASS/MT	ISOLATED 1985, PROJECT B-138 INTERIM STABILIZED 1990
241-B-301-B	B FARM	151-B, 152-B, 153-B, 252-B DB	UNKNOWN	NM	ISOLATED 1985(1)
241-B-302-B	B FARM	154-B DB	UNKNOWN	NM	ISOLATED 1985(1)
241-BX-302-A	BX FARM	152-BR, 153-BX, 152-BXR, 152-BYR DB	UNKNOWN	NM	ISOLATED 1985(1)
241-BX-302-B	BX FARM	154-DB	UNKNOWN	NM	ISOLATED 1985(1)
241-BX-302-C	BX FARM	155-B DB	UNKNOWN	NM	ISOLATED 1985(1)
241-C-301-C	C FARM	151-C, 152-C, 153-C, 252-C DB	UNKNOWN	NM	ISOLATED 1985(1)
241-CX-70	HOT SEMI-	TRANSFER LINES	UNKNOWN	NM	ISOLATED, DECOMMISSION PROJ.
241-CX-72	WORKS	TRANSFER LINES	UNKNOWN	NM	SEE DWG H-2-95-501, 2/5/87
244-AR	A COMPLEX	DCRT - RECEIVES FROM SEVERAL FARMS	UNKNOWN	NM	BEING UPGRADED
244-BXR-TK/SMP-001	BX FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED 1985(1)
244-BXR-TK/SMP-002	BX FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED 1985(1)
244-BXR-TK/SMP-003	BX FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED 1985(1)
244-BXR-TK/SMP-011	BX FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED 1985(1)
361-B-TANK	B PLANT	DRAINAGE FROM B-PLANT	UNKNOWN	NM	INTERIM STABILIZED 1985(1)

Total East Area inactive facilities 15

LEGEND: DB - Division 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

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TABLE H-3. WEST AREA CATCH TANKS AND SPECIAL SURVEILLANCE FACILITIES

INACTIVE - no longer receiving waste transfers

December 31, 1993

VOLUME
OF
CONTENTS

FACILITY	LOCATION	RECEIVED WASTE FROM:	(Gallons)	BY	REMARKS
241-S-302	S FARM	240-S-151 DB	2276	CASS/FIC *	ASSUMED LEAKER EPDA 85-04
241-S-302-A	S FARM	241-S-151 DB		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-304(302)	SX FARM	152-SX TRANSFER BOX, 151-SX DB	UNKNOWN	NM	ISOLATED 1985(1)
241-TX-302	TX FARM	153-TX 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	155-TX DB	1480	CASS/MT	NEW MT INSTALLED 7/16/93
241-TY-302-A	TY FARM	153-TX DB	UNKNOWN	NM	ISOLATED 1985(1)
241-TY-302-B	TY FARM	TY ENCASEMENTS	UNKNOWN	NM	ISOLATED 1985(1)
244-U-TK/SMP	U FARM	DCRT - RECEIVES FROM SEVERAL FARMS	UNKNOWN	NM	NOT YET IN USE
244-UR VAULT	U FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED, MT REMOVED 1985(1)
244-UR-TK/SMP-001	U FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED, MT REMOVED 1985(1)
244-UR-TK/SMP-002	U FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED, MT REMOVED 1985(1)
244-UR-TK/SMP-003	U FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED, MT REMOVED 1985(1)
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)
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 STABILIZED, MT REMOVED 1985(1)

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Total West Area inactive facilities 20

LEGEND: DB - Diversion Box
DCRT - Double-Contained Receiver Tank
TK - Tank
SMP - Sump
R - Usually denotes replacement
FIC - Food Instrument Corporation
MT - Manual Tape
O/S - Out of Service
CASS - Computer Automated Surveillance System
NM - Not Monitored

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

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APPENDIX I
LEAK VOLUME ESTIMATES

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TABLE I-1. SINGLE-SHELL TANK LEAK VOLUME ESTIMATES (4) (Sheet 1 of 6)

Tank No.	Date Declared Confirmed or Assumed Leaker (3)	Volume (2)(4) (Gallons)	Associated KiloCuries 137 cs (10)	Interim Stabilized Date (12)	Leak Estimate Updated Reference
241-A-103	1987	5500 (9)		8/88	1987 (f)
241-A-104	1975	500 to 2500	0.8 to 1.8 (q)	9/78	1983 (a)(q)
241-A-105 (1)	1983	10000 to 277000	85 to 760 (b)	7/79	1991 (b),(c)
241-AX-102	1988	3000 (9)		9/88	1989 (h)
241-AX-104	1977	-- (7)		8/81	1989 (g)
241-B-101	1974	-- (7)		3/81	1989 (g)
241-B-103	1978	-- (7)		2/85	1989 (g)
241-B-105	1978	-- (7)		12/84	1989 (g)
241-B-107	1980	8000 (9)		3/85	1986 (d)(f)
241-B-110	1981	10000 (9)		3/85	1986 (d)(f)
241-B-111	1978	-- (7)		8/85	1989 (g)
241-B-112	1978	2000 (9)		5/85	1989 (g)
241-B-201	1980	1200 (9)		8/81	1984 (e)(f)
241-B-203	1983	300 (9)		6/84	1986 (g)
241-B-204	1984	400 (9)		6/84	1989 (g)
241-BX-101	1972	-- (7)		9/78	1989 (g)
241-BX-102	1971	70000	50 (f)	11/78	1986 (g)
241-BX-108	1974	2500	0.5 (f)	7/79	1986 (g)
241-BX-110	1976	-- (7)		8/85	1989 (g)
241-BX-111	1984	-- (7)		N/A	1993 (g),(f)
241-BY-103	1973	<5000		N/A	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)		7/79	1989 (g)
241-BY-108	1972	<5000		2/85	1983 (a)
241-C-101	1980	20000 (9,11)		11/83	1986 (g)
241-C-110	1984	2000		N/A	1989 (g)
241-C-111	1988	5500 (9)		3/84	1989 (g)
241-C-201 (5)	1988	550		3/82	1987 (g)
241-C-202 (5)	1988	450		8/81	1987 (g)
241-C-203	1984	400 (9)		3/82	1986 (g)
241-C-204 (5)	1988	350		9/82	1987 (g)
241-S-104	1988	24000 (9)		12/84	1989 (g)
241-SX-104	1988	6000 (9)		N/A	1988 (k)
241-SX-107	1984	<5000		10/79	1983 (a)
241-SX-108 (6)	1982	2400 to 35000	17 to 140 (m)(q)	8/79	1991 (m)(q)
241-SX-109 (6)	1985	<10000	<40 (n)	5/81	1992 (n)
241-SX-110	1976	5500 (9)		8/79	1989 (g)
241-SX-111	1974	500 to 2000	0.6 to 2.4 (f)(q)	7/79	1986 (d)(q)
241-SX-112	1989	30000	40 (f)	7/79	1986 (g)
241-SX-113	1982	15000	8 (f)	11/78	1986 (g)
241-SX-114	1972	-- (7)		7/79	1989 (g)
241-SX-115	1985	50000	21 (o)	9/78	1992 (g)
241-T-101	1992	7500 (9)		4/93	1992 (g)
241-T-103	1974	<1000 (9)		11/83	1989 (g)
241-T-106	1973	115000 (9)	40 (f)	8/81	1986 (g)
241-T-107	1984	-- (7)		N/A	1989 (g)
241-T-108	1974	<1000 (9)		11/78	1980 (g)
241-T-109	1974	<1000 (9)		12/84	1989 (g)
241-T-111 (5)	1984	<1000 (9)		N/A	1980 (g)
241-TX-105	1977	-- (7)		4/83	1989 (g)
241-TX-107	1984	2500		10/79	1986 (g)
241-TX-110	1977	-- (7)		4/83	1989 (g)
241-TX-113	1974	-- (7)		4/83	1989 (g)
241-TX-114	1974	-- (7)		4/83	1989 (g)
241-TX-115	1977	-- (7)		9/83	1989 (g)
241-TX-116	1977	-- (7)		4/83	1989 (g)
241-TX-117	1977	-- (7)		3/83	1989 (g)
241-TY-101	1973	<1000 (9)		4/83	1980 (g)
241-TY-103	1973	3000	0.7 (f)	2/83	1986 (g)
241-TY-104	1981	1400 (9)		11/83	1986 (g)
241-TY-105	1980	35000	4 (f)	2/83	1986 (g)
241-TY-106	1989	20000	2 (f)	11/78	1986 (g)
241-U-101	1989	30000	20 (f)	9/79	1986 (g)
241-U-104	1981	55000	0.09 (f)	10/78	1986 (g)
241-U-110	1975	5000 to 8100 (9)	0.05 (q)	12/84	1986 (d)(q)
241-U-112	1980	8500 (9)		9/79	1986 (d)(q)
67 Tanks		<500,000 - 900,000 (g)			

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

FOOTNOTES: SEE NEXT PAGE

TABLE I-1. SINGLE-SHELL TANK LEAK VOLUME ESTIMATES
(Sheet 2 of 4)

Footnotes:

- (1) Current estimates (see reference b) are that 610 Kgal 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)(i)), 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 Kgal to 277 Kgal) is based on the following (see References).
- Reference (b) contains an estimate of 5 Kgal to 15 Kgal for the initial leak prior to August 1968.
 - Reference (b) contains an estimate of 5 Kgal to 30 Kgal for the leak while the tank was being sluiced from August 1968 to November 1970.
 - Reference (b) contains an estimate of 610 Kgal 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.
 - Reference (c) contains an estimate that 378 to 410 Kgal 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 Kgal 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

- 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.
- 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 as 1961. Using present standards, Tank 241-U-104 would have been declared as 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.
- There has been an effort in the past two years to reevaluate these leak volume estimates. During the FY 1993 funding review, this reevaluation of leak volumes was given a priority which resulted in this activity no longer being funded. The priority versus funding will be reevaluated as part of the prior to FY 1994 budget planning.
- 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.
- The increasing radiation levels in drywells and laterals associated with these three tanks could be indicative of a continuing leak or movement of existing radionuclides in the soil. There is no conclusive way to confirm these observations.
- 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 (10). For more details see reference (g). The total leak volume estimate for these tanks is 150 Kgal (rounded to the nearest 10 Kgal), for an average of approximately 8 Kgal for each of the 19 tanks.

TABLE I-1. SINGLE-SHELL TANK LEAK VOLUME ESTIMATES
(Sheet 3 of 4)

- (8) The total has been rounded to the nearest 50 Kgal. Upperbound 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 listed 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 reference (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.

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

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) WMC, 1991a, Tank 241-A-105 Leak Assessment, WMC-MR-0264, Westinghouse Hanford Company, Richland, Washington.
- (c) WMC, 1991b, Tank 241-A-105 Evaporation Estimate 1970 Through 1978, WMC-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. Veil, September 1984, Waste Status Summary, RHO-RE-SR-14, Rockwell Hanford Operations, Richland, Washington.
- (f) Catlin, R. J., March 1980, Assessment of the Surveillance Program of the High-Level Waste Storage Tanks at Hanford, Hanford Engineering Development Laboratory, Richland, Washington.
- (g) Baumhardt, R. J., May 15, 1989, Letter to R. E. Gerton, U.S. Department of Energy-Richland Operations Office, Single-Shell Tank Leak Volumes, Westinghouse Hanford Company, Richland, Washington.
- (h) WMC, 1990a, Occurrence Report, Surface Level Measurement Decrease in Single-Shell Tank 241-AX-102, WMC-UO-89-023-TF-05, Westinghouse Hanford Company, Richland, Washington.
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- (j) Groth, D. R. and G. C. Owens, May 15, 1987, Internal Memorandum to J. H. Roecker, Tank 103-A Integrity Evaluation, Westinghouse Hanford Company, Richland, Washington.
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APPENDIX J
INTERIM STABILIZATION STATUS

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TABLE J-1. SINGLE-SHELL TANKS INTERIM STABILIZATION STATUS (Sheet 1 of 2)
December 31, 1993

Tank Number	Tank Integrity	Interim Stabilized Date (1)	Stabilized Method (2)(3)	Tank Number	Tank Integrity	Interim Stabilized Date (1)	Stabilized Method (2)(3)	Tank Number	Tank Integrity	Interim Stabilized Date (1)	Stabilized Method (2)(3)
A-101	SOUND	N/A		C-101	ASMD LKR	11/83	AR	T-108	ASMD LKR	11/78	AR
A-102	SOUND	02/83	SN	C-102	SOUND	N/A		T-109	ASMD LKR	12/84	AR
A-103	ASMD LKR	08/88	AR	C-103	SOUND	N/A		T-110	SOUND	N/A	
A-104	ASMD LKR	08/78	AR	C-104	SOUND	08/88	SN	T-111	ASMD LKR	N/A	
A-105	ASMD LKR	07/79	AR	C-105	SOUND	N/A		T-112	SOUND	03/81	AR
A-106	SOUND	08/83	AR	C-106	SOUND	N/A		T-201	SOUND	04/81	AR
AX-101	SOUND	N/A		C-107	SOUND	N/A		T-202	SOUND	08/81	AR
AX-102	ASMD LKR	03/83	SN	C-108	SOUND	03/84	AR	T-203	SOUND	02/81	AR
AX-103	SOUND	08/87	AR	C-109	SOUND	11/88	AR	T-204	SOUND	08/81	AR
AX-104	ASMD LKR	08/81	AR	C-110	ASMD LKR	N/A		TX-101	SOUND	03/83	AR
B-101	ASMD LKR	08/81	SN	C-111	ASMD LKR	08/81	AR	TX-102	SOUND	04/83	JET
B-102	SOUND	08/83	SN	C-112	SOUND	08/80	AR	TX-103	SOUND	08/83	JET
B-103	ASMD LKR	02/85	SN	C-201	ASMD LKR	08/80	AR	TX-104	SOUND	08/79	SN
B-104	SOUND	08/83	SN	C-202	ASMD LKR	08/81	AR	TX-105	ASMD LKR	04/83	JET
B-105	ASMD LKR	12/84	AR	C-203	ASMD LKR	08/83	AR	TX-106	SOUND	08/83	JET
B-106	SOUND	12/83	SN	C-204	ASMD LKR	08/82	AR	TX-107	ASMD LKR	10/79	AR
B-107	ASMD LKR	03/86	SN	C-301	SOUND	N/A		TX-108	SOUND	03/83	JET
B-108	SOUND	02/85	SN	B-102	SOUND	N/A		TX-109	SOUND	04/83	JET
B-109	SOUND	04/85	SN	B-103	SOUND	N/A		TX-110	ASMD LKR	04/83	JET
B-110	ASMD LKR	19/83	AR	B-104	ASMD LKR	12/84	AR	TX-111	SOUND	02/83	JET
B-111	ASMD LKR	08/86	SN	B-105	SOUND	08/83	JET	TX-112	SOUND	04/83	JET
B-112	ASMD LKR	08/83	SN	B-106	SOUND	N/A		TX-113	ASMD LKR	04/83	JET
B-201	ASMD LKR	08/81	AR	B-107	SOUND	N/A		TX-114	ASMD LKR	04/83	JET
B-202	SOUND	08/83	AR	B-108	SOUND	N/A		TX-115	ASMD LKR	08/83	JET
B-203	ASMD LKR	08/84	AR	B-109	SOUND	N/A		TX-116	ASMD LKR	04/83	JET
B-204	ASMD LKR	08/83	AR	B-110	SOUND	N/A		TX-117	ASMD LKR	08/83	JET
BX-101	ASMD LKR	08/78	AR	B-111	SOUND	N/A		TX-118	SOUND	04/83	JET
BX-102	ASMD LKR	11/79	AR	B-112	SOUND	N/A		TY-101	ASMD LKR	04/83	JET
BX-103	SOUND	11/83	AR	BX-101	SOUND	N/A		TY-102	SOUND	08/79	AR
BX-104	SOUND	08/85	SN	BX-102	SOUND	N/A		TY-103	ASMD LKR	08/83	JET
BX-105	SOUND	03/81	SN	BX-103	SOUND	N/A		TY-104	ASMD LKR	11/83	AR
BX-106	SOUND	N/A		BX-104	ASMD LKR	N/A		TY-105	ASMD LKR	08/83	JET
BX-107	SOUND	08/80	JET	BX-105	SOUND	N/A		TY-106	ASMD LKR	11/78	AR
BX-108	ASMD LKR	07/79	SN	BX-106	SOUND	N/A		U-101	ASMD LKR	08/78	AR
BX-109	SOUND	08/80	JET	BX-107	ASMD LKR	10/79	AR	U-102	SOUND	N/A	
BX-110	ASMD LKR	08/83	SN	BX-108	ASMD LKR	08/78	AR	U-103	SOUND	N/A	
BX-111	ASMD LKR	N/A		BX-109	ASMD LKR	08/81	AR	U-104	ASMD LKR	10/78	AR
BX-112	SOUND	08/83	JET	BX-110	ASMD LKR	08/79	AR	U-105	SOUND	N/A	
BY-101	SOUND	08/84	JET	BX-111	ASMD LKR	07/79	SN	U-106	SOUND	N/A	
BY-102	SOUND	N/A		BX-112	ASMD LKR	07/79	AR	U-107	SOUND	N/A	
BY-103	ASMD LKR	N/A		BX-113	ASMD LKR	11/78	AR	U-108	SOUND	N/A	
BY-104	SOUND	01/83	JET	BX-114	ASMD LKR	07/79	AR	U-109	SOUND	N/A	
BY-105	ASMD LKR	N/A		BX-115	ASMD LKR	08/78	AR	U-110	ASMD LKR	12/84	AR
BY-106	ASMD LKR	N/A		T-101	ASMD LKR	04/83	SN	U-111	SOUND	N/A	
BY-107	ASMD LKR	07/79	JET	T-102	SOUND	05/81	AR	U-112	ASMD LKR	08/78	AR
BY-108	ASMD LKR	08/83	JET	T-103	ASMD LKR	11/83	AR	U-201	SOUND	08/78	AR
BY-109	SOUND	N/A		T-104	SOUND	N/A		U-202	SOUND	08/78	SN
BY-110	SOUND	01/85	JET	T-105	SOUND	08/87	AR	U-203	SOUND	08/78	AR
BY-111	SOUND	01/85	JET	T-106	ASMD LKR	08/81	AR	U-204	SOUND	08/78	SN
BY-112	SOUND	08/83	JET	T-107	ASMD LKR	N/A					
LEGEND: AR = Administratively Interim Stabilized JET = Selfwell 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 106 Not Yet Interim Stabilized 43 Total Single-Shell Tanks 149			

Footnotes: See next page

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

Footnotes:

Note: Further information on the data below can be found in WMC-SD-RE-TI-178, "Single-Shell Tank Stabilization Record," dated 1991. This document is currently being revised.

- (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) The following six tanks do 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-104, 110, 111
T-102, 112
U-110

- (3) Interim Stabilization data are missing on four tanks. These tanks were Administratively Interim Stabilized.

B-201, T-102, 112, 201

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V. L. Hunter	K7-94
P. R. Hrma	P8-37
J. Janata	K2-12

Distribution - continued

B. M. Johnson	K1-78
E. O. Jones	P8-38
D. E. Larson	G3-02
S. G. McKinley	P7-22
B. D. McVeety	K6-63
I. C. McVeety	K7-22
P. J. Mellinger	P7-22
B. E. Opitz	K6-79
M. D. Patridge	K7-94
M. S. Peffers	K7-94
R. K. Quinn	K1-73
W. G. Richmond	P7-41
J. M. Robbins	P7-22
R. D. Scheele	P7-25
E. A. Schmieman	B1-40
R. C. Schrotke	P7-18
P. A. Scott	P7-19
D. A. Seaver	K1-73
J. C. Spanner	K2-05
J. L. Straalsund	K1-79
K. L. Steinmaus	K6-84
J. L. Swanson	P7-25
K. M. Tominey	K7-97
R. S. Wegeng	K7-97
P. D. Whitney	K7-34
T. W. Wood	K6-47

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Sciences Richland/ICF Kaiser Hanford Company

A. T. Alstad	R1-49
W. T. Alumkal	R2-52
R. P. Anantatmula	R2-11
J. D. Anderson	N3-11
J. N. Appel	S4-58
I. J. Austin	T4-01
H. Babad	R2-78
J. K. Bajwa	H4-63
R. A. Ballou	S4-58
A. D. Bates	T3-01
T. J. Bander	H0-33
L. L. Barry	R1-67
G. D. Bazinet	L4-71
L. Bedford	S5-07
D. L. Becker	H5-57
D. B. Bechtold	T6-09
R. V. Berg	R4-02
M. V. Berriochoa	B3-30
P. K. Bhatia	S4-58
B. D. Biddle (6)	S5-14
K. R. Birney	H0-40
D. L. Bjorklund	S6-01
J. E. Bjorklund	R1-62
R. J. Blanchard	R1-17

Distribution - continued

D. C. Board	S1-57
K. D. Boomer	H5-49
G. L. Borsheim	R2-11
V. C. Boyles	R1-49
D. A. Bragg	R1-49
D. R. Bratzel	L5-31
W. R. Brooksher	L4-01
T. M. Brown	R2-12
R. G. Brown	R2-14
J. H. Bussell	L7-06
J. A. Caggiano Jr	H6-06
J. W. Carey	S5-07
R. J. Cash	R2-78
T. Chiao	L0-06
G. Christensen	H4-21
K. L. Chubb	L6-86
G. J. Coleman	T4-07
J. C. Conner	H4-61
R. B. Conrad	H5-09
F. M. Coony	H6-07
W. L. Cowley	H4-61
C. Crawford	R3-01
N. R. Croskrey	R1-30
G. M. Crummel	R1-51
J. M. Cruse	L5-63
D. S. Cunningham	S0-02
S. A. Davidson	K6-26
J. S. Davis	H4-64
S. J. Dechter	R2-54
C. DeFigh-Price	R2-31
T. A. Demitruk	H5-36
C. J. Denson	L4-95
D. R. Dickinson	L5-31
S. E. Dieterle	S2-20
L. F. Dougherty	H4-63
J. G. Douglas	L5-55
G. L. Dunford	R1-51
R. F. Eggers	S4-58
D. R. Ellingson	H5-37
F. W. Ellis	B4-52
D. B. Engelman	R2-18
R. W. Ewert	R1-19
S. D. Estey	R2-11
W. G. Farley	H4-62
J. E. Fasso Jr.	S3-10
K. O. Fein	H4-63
L. A. Fort	S4-57
K. D. Fowler	R2-11
S. B. Fowler	L0-24
C. R. Fox	S4-60
G. L. Fox, Jr.	L5-01
H. P. Fox	R2-88
G. T. Frater	R1-51
E. A. Fredenburg	S4-55

Distribution - continued

J. R. Freeman-Pollard	H6-03
R. T. French	E6-61
J. C. Fulton	R2-31
K. A. Gasper	L6-29
G. J. Gauck	R1-51
C. J. Geier	R2-50
P. W. Gibbons	S4-58
R. L. Gilchrist	L5-63
D. A. Gilles	S2-14
S. D. Godfrey	R1-51
D. E. Good	S3-97
D. J. Green	H5-53
A. Greenberg	S2-66
P. R. Golberg	B4-08
P. Greenbaum	S5-20
J. M. Grigsby	H4-62
R. D. Gustavson	R1-51
K. D. Haggerty	T4-09
L. E. Hall	E6-25
V. W. Hall	R2-85
C. S. Haller	G6-04
D. W. Hamilton	T6-02
K. L. Hampsten	L4-71
B. M. Hanlon (30)	R1-80
J. M. Hanson	R2-85
H. D. Harmon	R2-52
M. S. Harrington	B4-53
J. P. Harris III	S4-55
G. A. Harvey	B4-52
F. J. Heard	H0-34
D. A. Healey	T4-07
J. M. Henderson	S4-55
D. W. Hendrickson	L5-55
E. G. Hess	R3-09
M. C. Higginson	A4-25
B. M. Hisaw	R1-62
M. J. Holm	R1-80
J. D. Hopkins	R2-11
B. K. Horsager	B5-24
J. H. Huber	R1-49
J. L. Huckaby	R2-78
A. L. Huegel	E6-31
J. V. Hurley	R4-02
J. J. Huston	S1-54
J. E. Irvin	R2-85
M. N. Islam	R3-08
M. T. Jansky	H6-26
G. D. Johnson	R2-78
J. L. Juette	G6-56
R. A. Karnesky	H0-39
D. L. Kelly	S5-20
R. A. Kirkbride	S4-58
P. F. Kison	S2-45
C. A. Kuhlman	B3-30

Distribution - continued

N. W. Kirch	R2-11
D. B. Klos	S0-14
A. G. Krasopoulos	A5-55
M. Kummerer	H4-62
M. J. Kupfer	H5-49
E. C. Ladd	R1-19
D. R. Lance	S0-09
J. L. Lee	R2-36
J. M. Light	B4-08
D. C. Lini	H3-56
B. H. Lueck Jr.	R3-12
P. J. Mackey	B3-15
G. T. MacLean	S4-58
M. K. Mahaffey	L4-73
R. M. Marusich	H4-60
V. D. Maupin	N1-73
T. B. McCall	H0-33
J. D. McCormack	L5-31
K. S. McCullough	H4-70
M. H. McGrath	S4-58
M. A. McLaughlin	H5-09
J. P. Menard	R2-40
W. C. Miller	S4-55
N. J. Milliken	H4-62
W. J. Millsap	H5-68
G. J. Miskho	R2-50
J. R. Mobley	H5-49
T. Moleff	R1-30
S. R. Morgan	R2-50
K. L. Morris	H5-09
J. P. Mullally	B5-24
L. D. Muhlestein	H4-64
R. L. Nelson (4)	R2-36
R. L. Newell	E6-31
D. J. Newland	R2-36
R. Ni	S5-07
T. W. Oden	R2-18
P. C. Ohl	H1-30
P. A. Olsen	R3-12
D. L. Osowski	L6-10
D. B. Pabst	B2-35
A. L. Pajunen	H5-49
R. B. Pan	H5-53
I. G. Papp	R3-45
L. D. Parchen	B3-63
G. L. Parsons	S4-57
M. A. Payne	R2-50
L. T. Pedersen	X5-52
L. D. Pennington	T4-07
S. R. Pierce	R1-51
R. S. Popielarczyk	R1-30
E. A. Porter	R2-88
T. B. Powers	H4-65
R. K. P'Pool	T1-30

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G. R. Priddy Jr.	R3-12
R. K. Quinn	K1-73
T. E. Rainey	R4-02
R. E. Raymond (3)	R2-54
R. W. Reed	R1-51
I. E. Reep	R2-08
M. A. Rezvani	H5-55
D. Richardson	R2-31
S. K. Rifaey	S6-12
W. E. Ross	S5-07
J. A. Ryan	H5-55
P. Sathyanarayana	R2-12
C. C. Scaief	L7-06
F. A. Schmorde	B2-18
C. P. Schroeder	L7-06
K. V. Scott	H5-52
N. J. Scott-Proctor	R1-80
O. Serrano	T4-01
L. K. Severud	R2-50
M. H. Shannon	H4-61
J. E. Shapley	H4-68
T. N. Shaw	S4-55
R. A. Shea	L8-16
E. M. Sheen	L7-03
E. J. Shen	S4-58
P. K. Shen	H0-39
D. J. Sherwood	R2-78
A. T. Shook	S2-01
E. R. Siciliano	H0-39
K. P. Slape	S0-11
C. M. Smith	H6-30
S. G. Spencer	R1-30
S. M. Stahl	H4-61
E. G. Stephan	A3-74
B. E. Stapley	R4-02
R. R. Stickney	R4-02
J. N. Strode	R2-11
D. G. Sutherland	L4-72
J. P. Summerhays	R2-88
M. J. Sutey	T4-08
S. L. Swaney	T4-08
L. M. Swanson	H5-49
J. F. Thompson	H5-68
J. D. Thomson	R1-30
S. R. Tifft	H6-26
J. A. Tilden (2)	L6-12
H. Toffer	H0-38
T. T. Tran	L7-04
J. W. Tritz	B1-32
D. P. Trott	B1-32
D. A. Turner	R2-78
L. A. Tusler	R2-11
C. J. Udell	L6-12
R. E. Van der Cook	L4-75

Distribution - continued

R. J. Van Vleet	H4-62
D. T. Vladimiroff	G7-01
J. A. Voogd	R4-03
G. R. Walker	B2-16
O. S. Wang	R2-78
D. L. Wegener	R1-62
R. K. Welty	R1-80
G. T. Wells	H6-26
R. Whitman	H5-49
J. H. Wicks	T4-07
D. D. Wiggins	R1-49
L. S. Williams	S4-53
C. R. Wilson	H5-52
G. R. Wilson	R2-31
M. E. Witherspoon	E6-61
D. D. Wodrich	R2-85
K. L. Woodard	R4-02
R. D. Wojtasek	H6-27
W. R. Wrzesinski	R3-74
P. A. Young	R2-14
F. A. Zak	R3-01
B. D. Zimmerman	L0-06

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